

Release Date :
Jan. 30, 2004

Final Well Report

**Vulcan Minerals Inc.
Captain Cook #1
Bay St. George Basin
Western, Newfoundland**

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Vulcan Minerals (Operator)**

**Prepared for: Department of Mines & Energy
Petroleum Division**

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1.0 **General Overview**

This report summarizes the 2001 / 2002 onshore petroleum well drilling program conducted by Vulcan Minerals Inc. within the Bay St. George Basin Western Newfoundland. The Captain Cook #1 well was spudded Jan. 7, 2002 and later terminated Jan. 30, 2002 at a total depth of 605.2 m.

1.01 **Introduction**

Captain Cook #1 was operated by Vulcan Minerals Inc. and drilled by Petro Drilling Company Limited utilizing a Boyles 56 Diamond Core Drilling Rig. The well was initiated on Dec. 18, 2001 with emplacement of 15.8 m of 6 inch pipe to bedrock by Clearwater Drilling of Port aux Basques using an artesian well drilling apparatus. The pipe was driven prior to drilling of the well to eliminate potential overburden problems often encountered by conventional core drilling rigs. The well was later spudded on Jan. 7, 2002 and the rig was subsequently released Jan. 30, 2002 upon completion of the well.

The purpose of the well was to test two Carboniferous aged geological formations believed to be potential reservoirs for the accumulation of hydrocarbons as well as to delineate a possible salt resource within the evaporite cap sequence. Other wells drilled within the basin by Vulcan Minerals Inc. (i.e. Flat Bay #1) had encountered significant oil shows in a relatively thick sequence of sandstone and conglomerate (Fishell's Brook Formation) that appeared geophysically prospective at the Captain Cook #1 well location.

As predicted the well bore penetrated a large interval of conglomerate and sandstone of the Codroy Group followed by a thick (~400 m) sequence of underlying evaporite rocks including ~150 m of salt formation. Minor indications of hydrocarbons were detected >430 m. The trace to minor oil staining paired with weak yellow fluorescence and cut appeared to be controlled by very fine, hairline wispy fractures within the evaporitic "cap" rocks – anhydrite, thus fracture porosity. The target reservoir formations, specifically the Ship Cove Limestone and Fishell's Brook Conglomerate / Sandstone, were found to be poorly developed at this particular location. In fact, only a mere 7 m of Ship Cove Limestone was observed before intersecting igneous granitoid basement rocks at 604 m, meaning the Fischell' Brook section was entirely missing.

1.02 **Well Location**

The Captain Cook #1 well was drilled within the Bay St. George Basin on permit # 96 – 105, N.T.S. Map Sheet 12B/7 (Figure 1). The well site lease is adjacent a well maintained gravel road ~ 5 km from the community of St. George's.

Stephenville, the regional service center for the area is approximately 22 km from the site (Figure 2).

1.03 **General Information**

A Well Data Summary is attached as Appendix I.

Well Name

Vulcan Minerals Inc. - Captain Cook #1

Exploration Permit

The well was drilled on exploration Permit 96 – 105 under the authority of Drilling Program Approval (DPA) # 2001-116-01 and Authority to Drill a Well (ADW) # 2001-116-01-01, both issued on Jan. 4, 2002 (Appendix II).

Location Co-ordinates

The NAD 27 UTM co-ordinates of the well are as follows:

Northing:	5361947.033 m N
Easting:	386780.227 m E
Elevation:	54.2 m

The survey was carried out by Enos Fudge Surveys of Stephenville using conventional surveying equipment and techniques.

1.04 **Difficulties and Delays**

Difficulties encountered while drilling were as follows:

- Minor rig up delays prior to spudding and drilling out surface casing
- Problematic formations in upper 200 m of hole, specifically poorly lithified pebble conglomerate and sandstone caused frequent loss circulation problems that had to be resolved before drilling ahead. Loss circulation materials (LCM's) had to be repeatedly dumped into hole and allowed to circulate in order to clog broken zones, thus slowing drilling times.
- Salt formation intersected at 197.5 m was overlain by a bed of poorly indurated mudstone that offered concern while drilling ahead.
- Rigging up and testing BOP's were more time consuming than expected

Vulcan Minerals Inc.
Captain Cook #1

Drilling Operations

2.00

2.00 Drilling Operations

A summary of the daily drilling operations are contained in Appendix III – Daily Drilling Reports.

2.01 Elevation

Elevations are above mean sea level as follows:

Ground - 54.00 m
Rotary Head (RH) – 58.60 m

2.02 Total Depth

The following depths are measured from the rotary head (rig floor):

Total depth – 605.2 m

2.03 Spud Date

The well was spudded Jan. 7, 2002 at 19:00 hrs.

2.04 Date Drilling Completed

The well ceased drilling on Jan. 29, 2002 at 18:00 hrs.

2.05 Rig Release Date

The drilling rig was released on Jan. 30, 2002 @ 17:00 hrs.

2.06 Well Status

The well was abandoned at 605.2 m. Two cement plugs were placed in the hole, from 382 m (15 m below surface casing shoe) to 352 m, and from 15 m to surface.

Well Head - The casing was cut 1 m below ground level and covered by a steel plate (welded) sealing both hole and annulus. The well head was later marked by a 1.5 m length of steel pipe welded to top of the well head, then a steel plate measuring 500 mm by 300 mm was bead welded with well name and well location co-ordinates.

2.07 Hole Sizes and Depth

The following depths are measured from rotary head (rig floor) and hole sizes are outside diameters (O.D. (mm)).

<u>Hole Section</u>	<u>Size (mm)</u>	<u>Depth (m)</u>
Conductor Pipe	114.3 (HW)	29.6
Surface	88.9 (HQ)	367
Main	75.7 (NQ)	605.2

2.08 **Bit Records**

The surface hole was drilled with a total of seven different 96 mm (HQ) diamond drilling bits. The main hole was drilled with two 75.7 mm (NQ) diamond-drilling bits. Depths in and out of each bit as well as type and serial # are outlined in Appendix IV.

2.09 **Casing and Cementing Record**

The casing used for the conductor pipe was HW casing, 114.3 mm – 52.2 kg/m³ with a HW shoe placed at 29.6 m. The casing used for the surface hole was HQ drill rods, 88.9 mm – 34.4 kg/m³, with a 96 mm HQ drill bit acting as the shoe set at 367 m. Thirty meters (10 joints) of NW casing replaced the top 30 meters of HQ rods (Figure 3).

The HW casing was cemented with Class A Portland Cement at a density of 16-pds/ gal, measurable cement returns were observed at surface. The HQ drill rods were cemented with 800 liters of Class G Portland Cement at 15.2 pds / gal. The cement was mixed with a brine solution (1224 kg/m³) and made up to 200% open hole volume, then displaced to surface by ~1700 liters of fresh water leaving an estimated 10 m of cement in rods. Measurable cement returns to surface with 600 psi.

2.10 **Side-tracked Hole**

Not applicable (N/A)

2.11 **Drilling Fluid**

The drilling fluids were brine solutions prepared with sacks of NaCl mixed with fresh water and drilling polymers - Milgel. Entirety of the hole was drilled with fluid densities in excess of 1040 kg/m³, > 197.5 meters, fluid density (salt) was increased to 1224 kg/m³ to saturate fluid and eliminate wash out of salt formation. Above prognosis depth (550 m) of target reservoir fluid densities were dropped to 1188 kg/m³ to reduce overbalanced situation and thus reducing chance of loss circulation in permeable zones.

2.12 **Fluid Disposal**

Drilling fluid contained in mud tanks following drilling completion were transported to Stephenville for processing at GDH Environmental Soil Remediation in compliance with government regulations.

2.13 **Fishing Operations**

No fishing operations were conducted on this particular well.

2.14 **Well Kicks**

There were no kicks encountered during drilling of well.

2.15 **Formation Leak – Off Tests**

A Formation Integrity Test (leak-off test) was conducted at 372 meters utilizing the following procedure: Pressure was applied on the formation (anhydrite) below the 88.9 mm casing shoe at a gradient equal to 18 kPa / m. Pull up inside surface casing to 366 m, close pipe rams, apply surface pressure of 2200 kPa (320 psi). Pressure was held for 15 minutes with minor loss of surface pressure, 320 – 225 psi (consistent with Surface Casing Test). Maximum Casing Applied Pressure (MCAP) - 320 psi, Equal Mud Density (EMD) – 1836 kg/m³ (15 pds / gal).

2.16 **Time Distribution**

<u>Activity</u>	<u>Total Hours</u>
Drilling	237
Rig Up / Down	25.5
Rig Repairs	41.5
Circulating	29
Tripping	21.5
Cementing	5.5
Wait on Cement	12
Drill Out Cement	11.5
Survey	2
Brine Preparation	7
Casing Preparation	7
BOP Rig Up / Tests	104
Wait on Parts	46
Stand By	7

2.17 **Deviation Plot**

Four directional / deviation surveys were conducted at various intervals in the well utilizing a conventional down hole magnetic survey compass - pajari instrument. All surveys measured 0 degrees of deviation – straight hole.

<u>Depth (meters)</u>	<u>Deviation (degrees)</u>
65.8	0
163.1	0
376	0
520	0

2.18 **Suspension Program**

Not applicable

2.19 **Well Schematic**

A detailed well schematic containing pertinent well bore information is attached (Figure 3).

2.20 **Fluid Samples**

No formation fluid samples were taken.

2.21 **Composite Well Record**

A composite Well Record is included as Appendix V. A detailed stratigraphic column is included as Appendix VI.

Vulcan Minerals Inc.
Captain Cook #1

Geology

3.00

3.00 Geology

3.01 Drill Cuttings

No cuttings were taken because entire hole from bedrock surface to total depth was cored.

3.02 Cores

The entire hole from bedrock surface to total depth was cored. One hundred percent core recovery. All drill core is stored at the Department of Mines & Energy's core storage facility in Pasadena, Newfoundland. All core boxes are numbered sequentially and marked with respective depth intervals (Appendix VII).

3.03 Lithology

A detailed description of drill core was compiled and is included in Appendix VIII. Chad Wells of Wells Consulting Services provided geological descriptions of all drill core.

3.04 Stratigraphic Column

A stratigraphic column chart is attached as Appendix VI.

3.05 Biostratigraphic Data

No biostratigraphic analysis has been carried out on core samples.

Vulcan Minerals Inc.
Captain Cook #1

Well Evaluation

4.00

4.0 Well Evaluation

4.01 Down Hole Logs

There were no down hole logging operations conducted.

4.02 Synthetic Seismogram

Not applicable

4.03 Vertical Seismic Profile

Not applicable

4.04 Velocity Surveys

Not applicable

4.05 Formation Stimulation

Not applicable

4.06 Formation Flow Tests

Not applicable

Vulcan Minerals Inc.
Captain Cook #1

Other Data

5.00

5.0 **Other Data**

5.01 **Mud Loggers Report**

Not applicable

5.02 **Directional and Deviation Survey**

See 2.17.

5.03 **Final Legal Survey**

The final legal survey as carried out by Enos Fudge Surveys is contained in Appendix IX.

5.04 **Core Photos and Analysis**

Not applicable

5.05 **Geochemical, Biostratigraphic, Petrological, Palynological Paleontological Reports**

The stratigraphic control of this well is considered excellent with 100% core recovery and geological descriptions of lithologies intersected paired with known petrological and geochemical data from offset wells.

5.06 **Well Termination Report**

A well termination program and approval is included in Appendix X of this report.

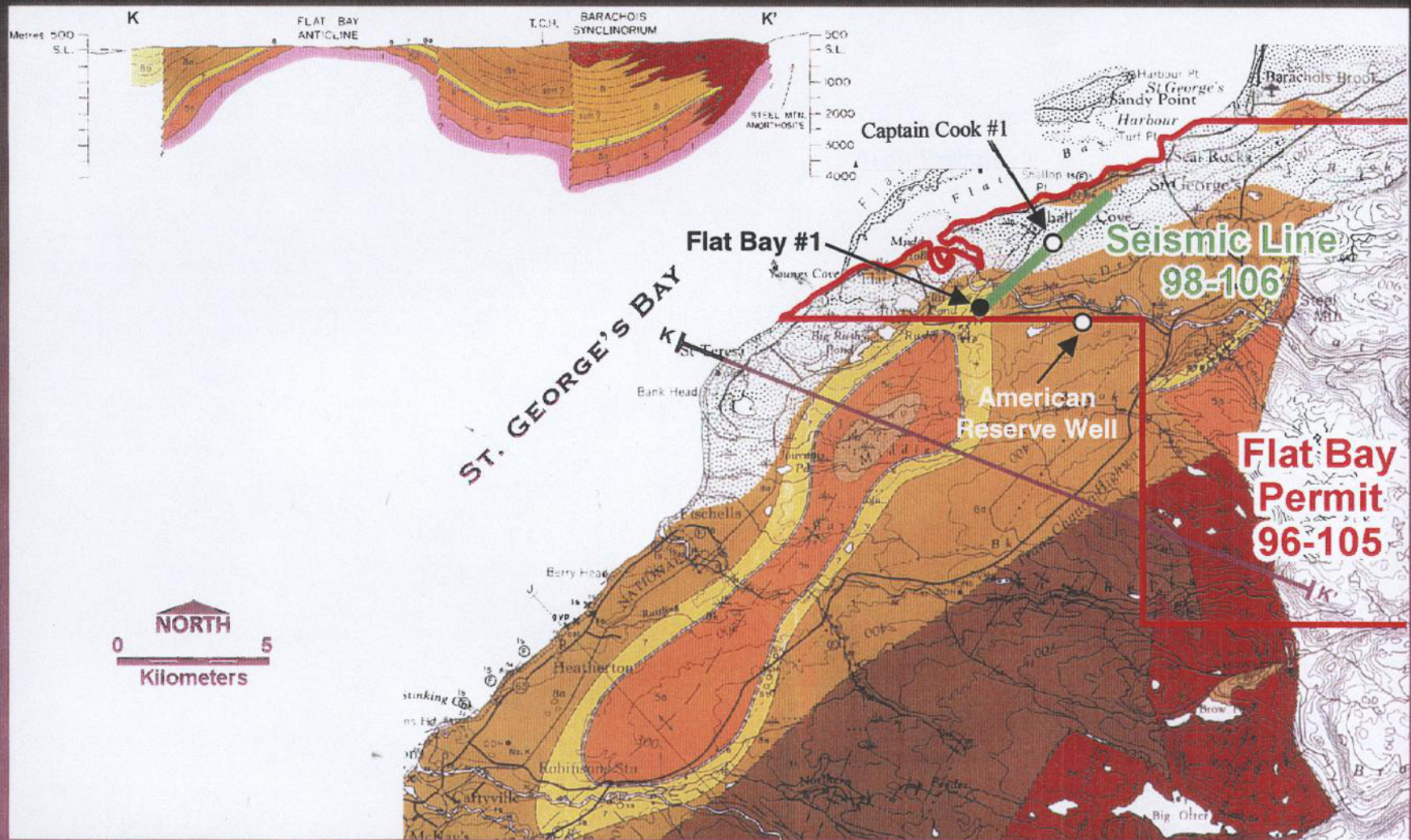
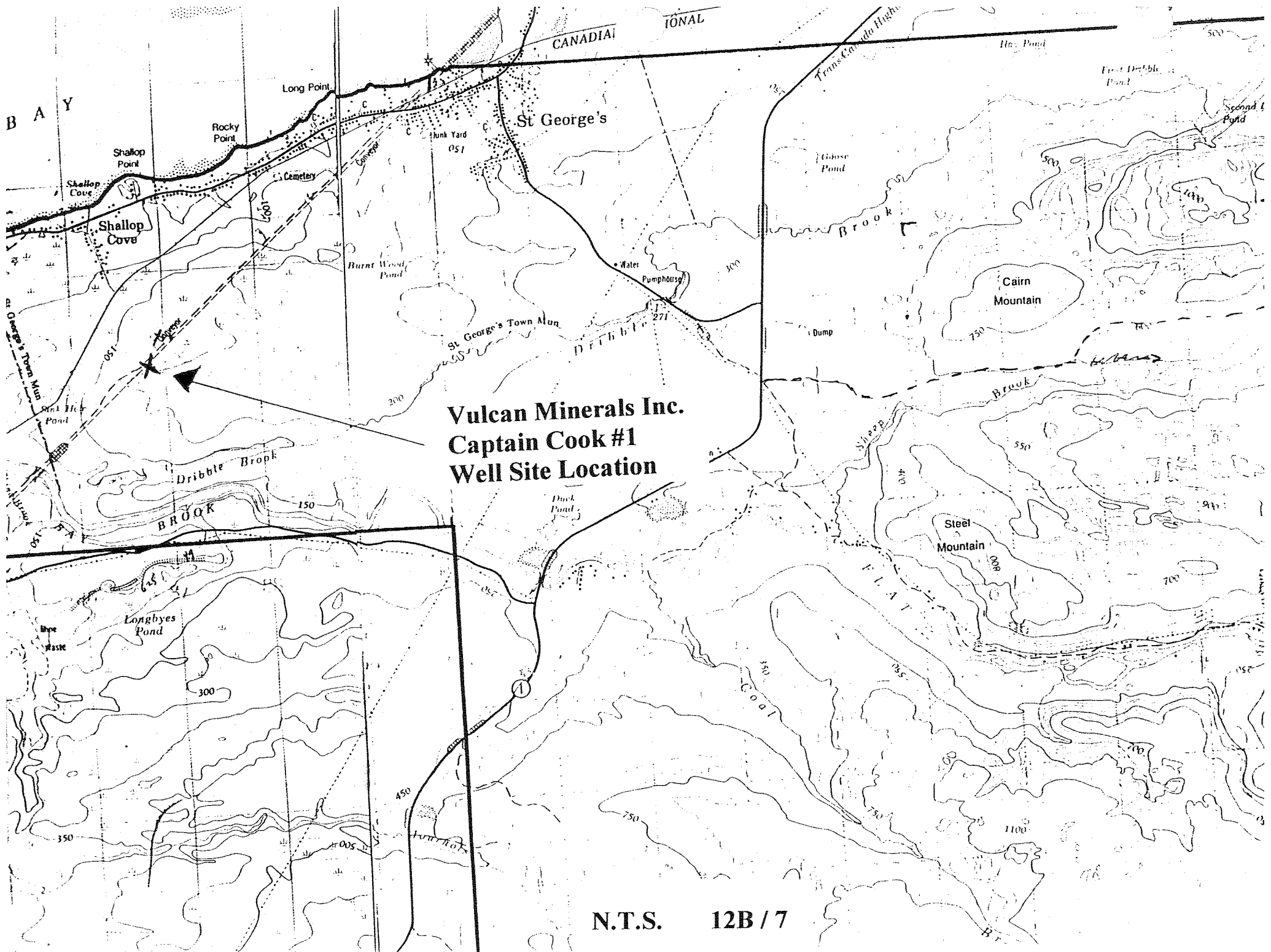


Figure 1

Northern Bay St. George Basin Geology



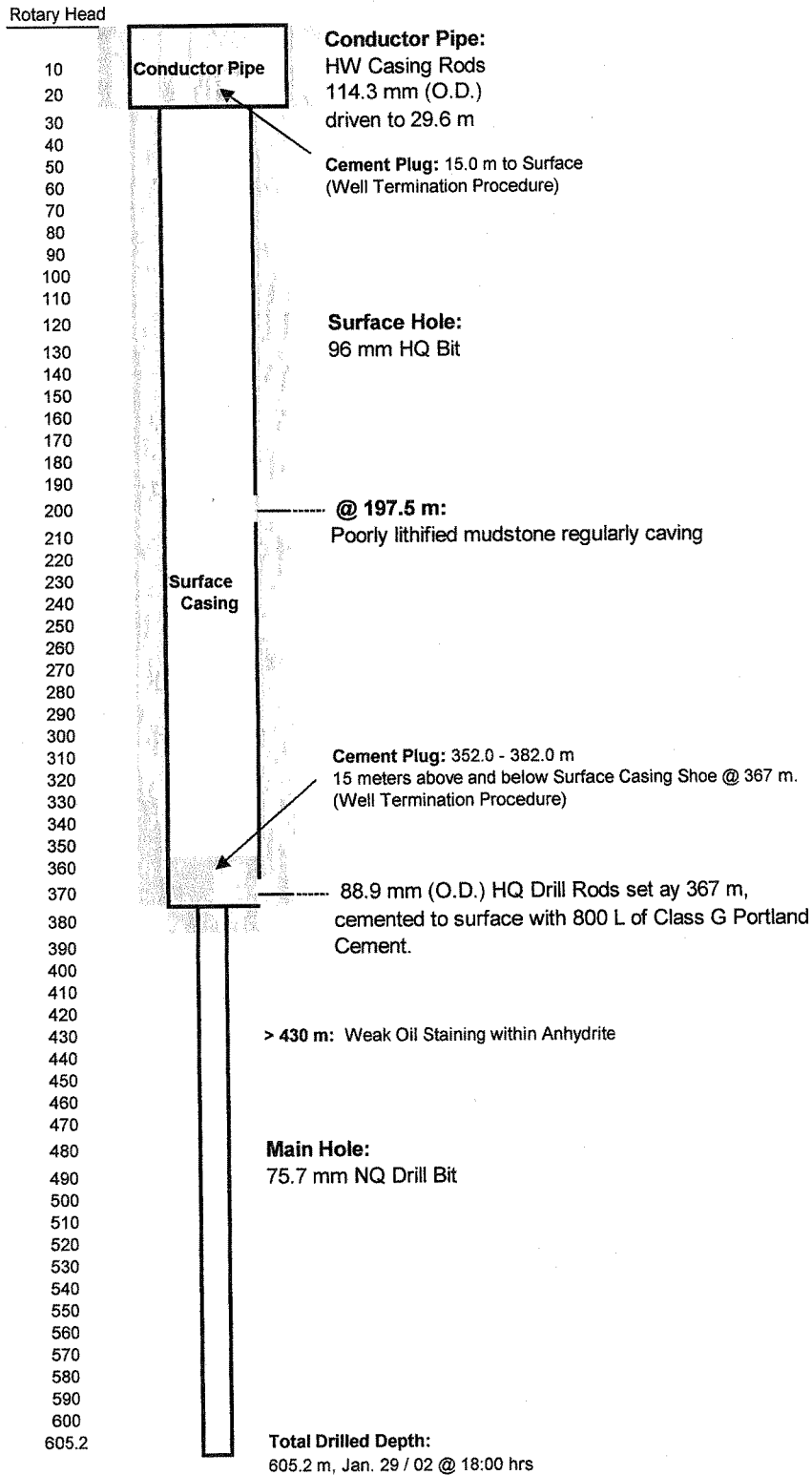
**Vulcan Minerals Inc.
Captain Cook #1
Well Site Location**

N.T.S. 12B / 7

**Well Schematic
CAPTAIN COOK # 1**

Figure 3

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.
Location: Flat Bay Area	License #: 96 - 105
Surface Coordinates: 5361947.033 m N	386780.227 m E
Ground Elevation: 54.00 m	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Rotary Head: 58.6 m	Spud Date: Jan. 7 / 2002 @ 17:00 hrs
Type of Drilling Fluid: Miigel	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs



APPENDIX I
WELL DATA SUMMARY

Vulcan Minerals Captain Cook #1

Well Data Summary

Well Name: CAPTAIN COOK #1

Well Location: Flat Bay Area, St. Georges Basin

Surface Location: 5361947.033 m N 386780.227 m E

U.W.I. : N/A **Well License #:** 96 - 105

Field Name: N/A **AFE #:** N/A

Elevations: **Ground:** 54.00 m
Rotary Head: 58.60 m

Contractor: Petro Drilling Limited **Rig #:** BBS 56

Spud Date & Time: 07/01/2001 @ 19:00 hrs

Hole Size: **Conductor Pipe:** 114.3 mm (HW)
Surface: 96 mm (HQ)
Main: 75.7 mm (NQ)

Total Depth: **Meters:** 605.2
Date & Time: Jan. 29/02 @ 18:00 hrs

Conductor Pipe: **Set at:** 29.6 **Weight:** 52.2 kg/m3
Size: 114.3 **Drilled Out:** 07/01/2002

Surface Casing: **Set at:** 367 m **Weight:** 34.4 kg/m3
Size: 88.9 **Drilled Out:** 25/01/2002

Drill Stem Tests: None

Coring: Total Hole

Open Hole Logs: None

Wellsite Supervision: **Geologist:** Chad Wells 673 - 6855
Drilling Superintendent: Bill Williams 673 - 7527
Drilling Supervisor: Barry Matthews 673 - 7435

Area Geologist: Patrick J. Laracy 754-3186 office
685-1606 cell

APPENDIX II
GOVERNMENT APPROVALS



GOVERNMENT OF
NEWFOUNDLAND
AND LABRADOR

Department of
Mines & Energy

DRILLING PROGRAM APPROVAL

RECEIVED

NOV 7 2001

Energy Branch
Department of Mines and Energy

APPLICATION

Pursuant to sections 8 and 9 of the *Petroleum and Natural Gas Act*¹, Vulcan Minerals Inc.,
as operator on behalf of itself, holding a
subsisting licence, permit or lease issued pursuant to the *Petroleum Regulations*², namely; 96-105 permit
(licence, permit, or lease #)

hereby applies for approval to conduct a drilling program using the drilling rig BBS 56
and equipment and procedures described in the detailed program dated November 1, 2001.

The undersigned operator's Representative hereby declares that, to the best of the operator's knowledge, the
information contained herein and in the attached detailed program is true, accurate and complete.

Signed: [Signature] Date: Nov. 7 / 01
Operator's Representative

APPROVAL

Pursuant to sections 8 and 9 of the *Petroleum and Natural Gas Act*, the operator named in the Application is hereby
authorized to conduct the proposed drilling program subject to the following conditions:

1. This Drilling Program Approval shall, unless otherwise extended or terminated, expire upon the 30th day of
June, 2002;
2. This Authorization shall be prominently displayed at the well site at all times during which operations are being
conducted;
3. Evidence of financial responsibility, as required pursuant to Section 14 of the *Petroleum Drilling Regulations*³,
shall be provided by the operator to the Minister of Mines and Energy;
4. The operator shall use the equipment and procedures described in the detailed program dated Nov. 1, 2001, with revisions
unless a change in the equipment or procedures is approved in writing by the Director; and
5. The operator shall comply with such other conditions as are appended to this Approval.

Signed: [Signature]
Director

Effective Date: Jan. 4, 2002

Drilling Program Approval No. 2001-116-01

¹ R.S.N. 1990, c. P-10
² CNR 1131/96
³ CNR 1130/96

SCHEDULE "A"

TO

AUTHORITY TO DRILL A WELL #2001-116-01-01

OTHER CONDITIONS

1. The Operator shall, prior to commencement of major site operations, ensure that an approved Operator's representative is on site to supervise all site operations.
2. Notwithstanding condition #3 of the Authorization (see previous page), the Operator shall comply with the requirements of the *Petroleum Drilling Regulations, (CNR 1150/96)* (the Regulations) unless the Operator has received written approval from the Director to deviate from the Regulations.
3. The Operator shall ensure that the well is drilled in a prudent and reasonable manner, consistent with good oilfield practices and with due consideration for the safety of personnel, property and the environment.
4. The Operator shall be liable for its actions and the actions of its agents, contractors, employees and any others acting under the Operator's authority in drilling and testing the well.
5. The Operator's liability for the actions of its agents, contractors, employees and any others acting under the Operator's authority in drilling the well does not limit any liability that those agents, contractors, employees or others acting under the Operator's authority may have to the Operator.
6. The Operator shall provide the Director with a videotape or photographs showing the final condition of the drillsite.
7. The Operator shall ensure that all necessary approvals have been acquired from other government agencies and other rights holders, in respect of access to and use of land for the purpose of the drilling and testing operation, and disposal of all materials.
8. The Operator shall attorn to the jurisdiction of the courts of the Province of Newfoundland.
9. The Operator shall conduct a logging program as outlined in Sections 95-98 of the *Petroleum Drilling Regulations, (CNR 1150/96)* which is to be submitted for final approval. No deviation from the approved logging program shall be permitted without the written approval of the Director. Final log data must be submitted in digital format in accordance with API RP66 DLIS V-2.00.
10. The Operator will provide a legal survey to confirm the location of the well prior to drilling out of the surface casing.
11. The Operator shall deliver all core recovered, properly boxed with lids, to the core storage facility in Pasadena, Newfoundland. To facilitate core unloading operations, it is advisable to contact the facility 48 hours prior to arrival.

12. Prior to commencing drilling operations, the Operator shall supply a statement signed by a Registered Professional Engineer in a form and manner approved by the Director, attesting that the drilling rig and associated equipment, including the BOP and manifold, have been inspected, and pursuant to Section 34 of the *Petroleum Drilling Regulations (CNR 1150/96)*, meet all regulatory requirements and will perform the drilling operations as outlined in the Drilling Program.
13. The deficiencies noted in the inspection report provided in item 12 above, must be corrected, and a follow-up report submitted by the site supervisor attesting that work has been completed in a satisfactory manner prior to drilling out of the conductor casing.
14. The Operator, prior to drilling below the surface hole, shall submit the blowout preventer equipment particulars including servicing and certification records, choke and kill manifold and accumulator details and obtain approval from the Director for the equipment use and configuration.
15. The DST details including a downhole tool schematic as well as surface testing equipment details and layout must be submitted for approval prior to carrying out those operations.
16. The details of any completion program must be submitted for approval prior to carrying out those operations.
17. Prior to commencing drilling operations, the Operator shall ensure that contingency plans have been verified and that equipment is available to cope with a foreseeable emergency situation.

January 4, 2002

Energy Branch
Department of Mines and Energy

APPLICATION

Authority to sections 8 and 9 of the *Petroleum and Natural Gas Act*¹ and in compliance with section 29 of the *Petroleum Drilling Regulations*², Vulcan Minerals Inc. as operator, hereby applies for Authority to Drill a Well to be known as Captain Cook #1 using the equipment and procedures described in the well program dated November 1, 2001 Permit, License, or Lease to which this Program applies: 96-105 permit

Area: Flat Bay		CO-ORDINATES	
Field/Pool:		Long:	UTM (NAD 27)
Drilling Rig: BBS 56		Lat:	Northing: 5361953 Easting: 386825
Rig Type: Skid mounted diamond core drill		ELEVATION	DEPTH
Drilling Contractor: Petro Drilling Co. Ltd.		RT/KB/RF:	T.D.: 1000m
		G.L.: 54m	TVD: 1000m
ESTIMATES		TARGET HORIZONS	
Spud Date: December 19, 2001	Well Cost: \$450,000.00	Carboniferous Codroy Rd(Evaporites) Ship Cove Formations(limestone) Fischells Brook(Conglomerates-sandstone) Pre-Carboniferous(limestone-clastics)	
Days on Location: 50			

EVALUATION PROGRAM

Ten-metre sample intervals: Continuous core	Conventional cores at: Continuous core
Five-metre sample intervals: Sampling	Logs and Tests: as per drilling program
Canned sample intervals:	

CASING AND CEMENTING PROGRAM

O.D (mm)	Weight (kg/m)	Grade	Setting Depth (m)	Cementing Program
114.3	16.83	HW	30	Cement to surface
88.9	12.8	NW	325	Cement to surface
Other Equipment:				
BOP stack; 21,000 kpa				

The undersigned operator's Representative hereby declares that, to the best of the Representative's knowledge, the information contained herein and in the attached detailed programs is true, accurate and complete.

Signed: [Signature] Date: Dec. 31/01
Operator's Representative [Signature] revising Nov/01.

AUTHORIZATION

Whereas the Minister of Mines and Energy is successor in jurisdiction to the Minister responsible for the Petroleum Directorate and has jurisdiction under the *Petroleum Drilling Regulations* ("the Regulations").

In accordance with section 32 of the Regulations, the operator named in the Application is authorized to undertake the proposed well program described above subject to the following conditions:

1. This Authorization shall be prominently displayed at the well site at all times during which operations are being conducted;
2. Copies of all logs and well test data shall be submitted to the director by the operator promptly after their acquisition; above well is to be drilled;
3. The operator shall comply with all conditions of the Drilling Program Approval No. 2001-116-01 under which the above well is to be drilled;
4. No change in the well program hereby approved may be made unless it is first approved by the director in writing;
5. This Authorization is conditional on the operator commencing drilling within 120 days of the effective Authorization date; and
6. The operator shall comply with such other conditions as are appended to this Authorization.

Signed: [Signature] Effective Date: Jan. 4, 2002
Director

Authority to Drill a Well No: 2001-116-01-01

¹ R.S.N. 1990, c. P-10
² CNR 1150/96

SCHEDULE "A"
TO
DRILLING PROGRAM APPROVAL #2001-116-01
OTHER CONDITIONS

1. Notwithstanding condition #4 of the Approval (see previous page), the Operator shall comply with the requirements of the *Petroleum Drilling Regulations* (the Regulations) unless the Operator has received written approval from the Director to deviate from the Regulations.
2. The Operator shall, prior to commencement of drilling operations, supply to the Department a certified cheque or irrevocable letter of credit for the amount of \$40 000 as fulfillment of the requirements of subsection 14(a) of the Regulations.
3. It is a condition of approval of this DPA, that prior to the commencement of drilling operations, the operator have in place a \$10,000,000 insurance policy and submit to the Director a certificate of insurance attesting to this amount and required coverage.
4. Prior to commencement of any drilling operations, the Operator must have on site and submit to the Director, an approved Contingency / Emergency Response Plan.
5. Pursuant to Section 154 of the Regulations, the director shall release to the public, general information including the name, classification, location, identity of the drilling contractor and rig used by the Operator, depth and operational status of the drilling program.
6. It is a condition of approval of this DPA that the Operator, pursuant to Section 52(2)(a) of the *Petroleum Regulations*, (CNR1151/96) provide to the director on a weekly basis a benefits monitoring report (sample forms attached) as well as a cost summary report showing AFE costs, costs to date and variances for all major cost categories.

January 4, 2002

APPENDIX III
DAILY DRILLING REPORTS

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 8/01				
Operator: Vulcan Minerals Inc.		Report #: 1				
Depth: 35.7 m (117 ft)	Progress: 4.6 m (20 ft)	Weather: cloudy				
Hole Cond: Good	Formation: Codroy SS	Temp: -4 C				
Drilling Superintendent: Bill Williams (709) 673-7527	Contractor: Petro	Wind: West				
	Drilling Rep: Barry Matthews	Roads: Good				
Drilling Personnel:	Driller	Helpers	Helpers			
Day Shift	Wayne Kurby	Hectar Hewlett	Cal Taylor			
Night Shift	Laverne Pynn	Lloyd Stuckless	Derek Taylor			
HSE (Health Safety and Environment): Held pre-Spud safety meeting with all wellsite personnel @ 7:00 am. Held BOP drill before drilling out conductor shoe.						
Elevations:		Ground (m): 0.00				
		Rotary Head (m): 4.6 m (15 ft)				
Casing Data:		O.D.	I.D. Capacity Shoe			
Conductor:		114.3 mm (HW)	101.6 mm 8.1 L / m 29.6 m (97 ft)			
Open Hole:		96 mm				
Drill Parameters:		Pump:				
ROP	WOB	RPM	GPM PSI			
3 m/ hr	500 kg	300-400	10 - 15 350 kpa			
Drilling Fluid:						
Fluid Type	Time	Depth	Viscosity	Density	pH	W. L.
Milgel	21:30	29.6	45	1040 kg/m3	8 - 8.5	
Bit Data:						
No.	Size	Type	Serial	From	To	Hours
1	96 mm			15 m	35.7 m	4
Surveys:						

Daily (24 Hour) Summary:

7:00 - 8:00	Held Pre-Spud Safety Meeting
7:00 - 15:00	Rig Up
15:00 - 16:00	Run in hole (R.I.H.) close annular and pressure test conductor to 100kpa Test failed - Fanlge leaking on casing bowl - Pulled out of hole (P.O.O.H)
16:00 - 19:00	Replace gasket on casing bowl flange, make up bit size on 10' core barrel. R.I.H. to 15 m, tag cement, close annular, and pressure test conductor to 1000 kpa for 15 min. Test OK.
19:00 - 21:00	Drill cement from 15 m to 29.6 m.
21:00 - 21:30	Held B.O.P. with drill personnel - close annular, open diverter valve - 50 sec.
21:30 - 24:00	Drill 96 mm hole, retrieving core (bedrock) 29.6 m to 32.7 m.
0:00 - 01:30	Repair winch on drill.
01:30 - 03:00	Drill from 32.7 to 35.7 m.
03:00 - 07:00	Close annular, install safety valve, and repair winch.

24 Look Ahead: Rig repair and drill ahead.

NOTE: Conductor pipe cemented Jan. 4/02 to a depth of 25 m (ground level) with class A Portland cement - 16 pds / gal, returns to surface.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 9 / 2002				
Operator: Vulcan Minerals Inc.		Report #: 2				
Depth: 35.7 m (117 ft)	Progress: nil	Weather: cloudy				
Hole Cond: Good (full returns)	Formation: Codroy SS	Temp: -2 C				
Drilling Superintendent: Bill Williams (709) 673-7527	Contractor: Petro	Wind: East				
	Drilling Rep: Barry Matthews	Roads: Good				
Drilling Personnel:	Driller	Helpers	Helpers			
Day Shift	Wayne Kurby	Hectar Hewlett	Cal Taylor			
Night Shift	Laverne Pynn	Lloyd Stuckless	Derek Taylor			
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange.				
Elevations:	Ground (m): 0.00					
	Rotary Head (m): 4.6 m (15 ft)					
Casing Data:	<u>O.D.</u>	<u>I.D.</u>	<u>Capacity</u>			
Conductor:	114.3 mm (HW)	101.6 mm	8.1 L / m			
Open Hole:	96 mm		29.6 m (97 ft)			
Drill Parameters:		Pump:				
<u>ROP</u>	<u>WOB</u>	<u>RPM</u>	<u>GPM</u>			
			10 - 15			
			<u>PSI</u>			
			350 kpa			
Drilling Fluid:						
<u>Fluid Type</u>	<u>Time</u>	<u>Depth</u>	<u>Viscosity</u>	<u>Density</u>	<u>pH</u>	<u>W. L.</u>
Milgel	21:30	29.6	45	1040 kg/m ³	8 - 8.5	
Bit Data:						
<u>No.</u>	<u>Size</u>	<u>Type</u>	<u>Serial</u>	<u>From</u>	<u>To</u>	<u>Hours</u>
1	96 mm		2679 - 1	15 m	37.5	4
2	96 mm		Q1846#1	35.7		
Surveys:						

Daily (24 Hour) Summary:

7:00 - 19:00	Rig repair - winch (rotary head selector assembly).
19:00 - 20:00	P.O.O.H. Retrieve core, mud up. New 96 mm bit, RIH to 35.7 m.
20:00 - 24:00	Circulate at 10 gpm - no returns, 20 gpm - returns at 5 gpm. Mix loss circulation material (LCM) and matrix pill. Pump and spot pill. Circulate with full returns for 1 hr.
24:00 - 07:00	Rig repair, winch - Rotary head selector assembly.

24 Look Ahead:

Rig repair and drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 10 / 2002		Weather: cloudy	
Operator: Vulcan Minerals Inc.		Report #: 3		Temp: - 1 C	
Depth: 61.9 m		Progress: 24.4 m		Wind: SW	
Hole Cond: Circulation Problems		Formation: Codroy SS		Roads: Good	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
Rotary Head: 58.6					
Drill String:		Joints		Length (m)	
HQ Rods		19		57.9 m	
BHA		Core Bbl+Bit		4.0 m (13.3 ft)	
		Capacity (L/M)		Volume (L)	
		4.77		276.2	
		4.77		19.1	
Total: 295.3					
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:		1.031		33.3	
Csg / HQ:		1.9		56.24	
BHA:					
Volumes:		Surface Vol:		18400 L	
		Hole Vol:		385 L	
		Total Vol:		18785 L	
Surveys:		Depth		Angle	
		65.8 m		0	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Open Hole:		96 mm			
Capacity		Shoe			
		8.1 L / m		29.6 m (97 ft)	
Drill Parameters:		Pump:			
ROP		WOB		RPM	
4.5 m/hr		450-700 kg		500-700	
		GPM		PSI	
		10 - 15		350 kpa	
Fluid Type		Time		Depth	
Milgel		16:30		40	
Viscosity		Density		pH	
45		1040 kg/m3		8 - 8.5	
W. L.					
Bit Data:		No.		Size	
		1		96 mm	
		2		96 mm	
		Type		Serial	
		Polycrystalline		Q1948	
		From		To	
		15 m		37.5	
		Hours		4	
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange.			

Daily (24 Hour) Summary:

7:00-12:00 Rig repair.
 12:00-07:00 Drill 96 mm hole from 37.5 m to 61.9 m. Loss circulation material being pumped regularly over problematic intervals to regain optimal circulation.

24 Look Ahead:

Drill ahead and resolve any encountered circulation problems.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 11 / 2002		Weather: cloudy	
Operator: Vulcan Minerals Inc.		Report #: 4		Temp: -2 C	
Depth (m): 104.5		Progress (m): 42.6		Wind: NW	
Hole Cond: Circulation Problems		Formation: Codroy SS		Roads: Good	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett	
Night Shift		Laverne Pynn		Lloyd Stuckless	
				Cal Taylor	
				Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Capacity (L/M)		Volume (L)	
HQ Rods		33		100.6	
BHA - Core Bbl+Bit		4		4.77	
				479.862	
				19.08	
				Total: 498.94	
Annulus:		Surveys:			
OH / HQ:		Litres / Meter		Depth	
1.031		Volume (L)		Angle	
Csg / HQ:		73.201		65.8 m	
1.9		56.24		0	
BHA:					
Casing Data:		Capacities		Shoe	
Conductor:		O.D.		I.D.	
114.3 mm (HW)		101.6 mm		8.1 L / m	
Open Hole: 96 mm				29.6 m (97 ft)	
Drill Parameters:		Pump:			
ROP		WOB		RPM	
2.75 m / hr		450-700 kg		500-700	
				10 - 15	
				350 kpa	
Fluid Type		Time		Depth	
Milgel		10:00		70	
				45	
				1040 kg/m3	
				8 - 8.5	
				W. L.	
Bit Data:		No.		Size	
		4		96 mm	
				Type	
				# 2	
				Serial	
				73.15	
				From	
				To	
				Hours	
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.			

Daily (24 Hour) Summary:

7:00-9:30 Drill 96 mm hole from 61.9 m to 66.1 m.
 09:30 - 11:00 P.O.O.H. and change bit.
 11:00-11:30 Survey with Tropari instrument - 0 degrees.
 11:30 -14:00 Drilled 96 mm hole from 66.1 to 73.15 m.
 14:00 - 15:30 P.O.O.H and change bit, then R.I.H.
 15:30 - 19:00 Drill 96 mm hole from 73.15 to 86.3 m.
 19:00 - 20:00 Drill 96 mm hole from 86.3 m to 88.1 m.
 20:00 - 01:00 Rig repair (seal on head assembly).
 01:00 - 07:00 Drill 96 mm hole from 88.1 to 104.5 m.

Note: Full core recovery.

24 Look Ahead:

Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 12 / 2002		Weather: cloudy	
Operator: Vulcan Minerals Inc.		Report #: 5		Temp: -2 C	
Depth (m): 155.8		Progress (m): 51.3		Wind: NW	
Hole Cond: Circulation Problems		Formation: Codroy SS		Roads: Good	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett	
Night Shift		Laverne Pynn		Lloyd Stuckless	
				Cal Taylor	
				Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Capacity (L/M)		Volume (L)	
HQ Rods		50		152.4	
BHA		Core Bbl+Bit		3.96	
		4.77		726.948	
		4.77		18.8892	
				Total: 745.84	
Annulus:		Surveys:			
OH / HQ:		Litres / Meter		Volume (L)	
1.031		126.6068		Surface Vol: 18000	
Csg / HQ:		1.9		Hole Vol: 928.684	
BHA:				Total Vol: 18928.684	
				Depth: 65.8 m	
				Angle: 0	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Open Hole:		96 mm		8.1 L / m	
				29.6 m (97 ft)	
Drill Parameters:		Pump:			
ROP		WOB		RPM	
2.28 m/hr		450-700 kg		500-700	
				GPM	
				10 - 15	
				PSI	
				350 kpa	
Fluid Type		Time		Depth	
Milgel		17:00		121.92	
				Viscosity	
				45	
				Density	
				1040 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:		No.		Size	
		5		96 mm	
				Type	
				SK - 7	
				Serial	
				126035	
				From	
				116.74	
				To	
				Hours	
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.			

Daily (24 Hour) Summary:

7:00-11:00 Drill 96 mm hole from 104.5 m to 123 m.
 11:00-12:30 P.O.O.H. and change bit and R.I.H.
 12:30-19:00 Drilled 96 mm hole from 123 to 136.8 m.
 19:00-07:00 Drill 96 mm hole from 136.8 to 155 m.

Note: Full core recovery.

24 Look Ahead: Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 13 / 2002		Weather: cloudy	
Operator: Vulcan Minerals Inc.		Report #: 6		Temp: - 6 C	
Depth (m): 199		Progress (m): 43.2		Wind: NW	
Hole Cond: Circulation Problems		Formation: Evaporite (salt)		Roads: Good	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Helpers		Rotary Head: 58.6	
Night Shift		Helpers			
		Wayne Kurby		Hectar Hewlett	
		Laverne Pynn		Cal Taylor	
				Derek Taylor	
Drill String:		Capacity (L/M)		Volume (L)	
HQ Rods		64		195.07	
BHA - Core Bbl+Bit		3.96		4.77	
		4.77		930.49344	
				18.8892	
				Total: 949.38	
Annulus:		Volumes:		Surveys:	
OH / HQ:		Surface Vol:		Depth (m)	
1.031		18000		Dev.	
Csg / HQ:		Hole Vol:		65.8	
1.9		1176.224272		0	
BHA:		Total Vol:		163.1	
		19176.22427		0	
Casing Data:		Capacity		Shoe	
Conductor:		8.1 L / m		29.6 m (97 ft)	
114.3 mm (HW)					
Open Hole: 96 mm					
Drill Parameters:		Pump:			
ROP		GPM		PSI	
2.28 m/hr		10 - 15		350 kpa	
WOB					
450-700 kg					
RPM					
500-700					
Fluid Type		Viscosity		pH	
Milgel		38		1140 kg / m3	
Time		Density		W. L.	
5:00					
Depth					
199					
Bit Data:					
No.		Serial		From	
5		126035		116.74	
Size		From		To	
96 mm					
Type		Hours			
SK - 7					
HSE (Health Safety and Environment): Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.					

Daily (24 Hour) Summary:

7:00-10:30 Drill 96 mm hole from 156.4 m to 163 m.
 10:30-11:00 Survey: 0 deg. Deviation @ 163 m.
 11:00-19:00 Drilled 96 mm hole from 163 to 179.9 m.
 19:00-05:00 Drill 96 mm hole from 179.9 m to 199 m. Lost circulation @ 197 m, circulated loss circulation material periodically for ~ 4 hrs.
 05:00-07:00 Encountered salt formation @197.5 m, suspended drilling to wait for salt delivery and brine preparation. Increase brine density to ~10 pds/gal.

Note: Full core recovery.

24 Look Ahead:

Prepare brine solutions, regain circulation and drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 14 / 2002		Weather: cloudy	
Operator: Vulcan Minerals Inc.		Report #: 7		Temp: 1 C	
Depth (m): 201		Progress (m): 2		Wind: NW	
Hole Cond: Good		Formation: Codroy SS		Roads: Good	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
		Capacity (L/M)		Volume (L)	
HQ Rods		66		197	
BHA -		Core Bbl+Bit		3.96	
		4.77		939.69	
		4.77		18.8892	
				Total: 958.58	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:		1.031		172.5894	
Csg / HQ:		1.9		56.24	
BHA:					
				Volumes:	
				Surface Vol: 18000	
				Hole Vol: 1187.4086	
				Total Vol: 19187.4086	
Surveys:				Depth	
				Angle	
				65.8 m 0	
				163.1 0	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Open Hole:		96 mm			
				Capacity	
				Shoe	
				8.1 L / m	
				29.6 m (97 ft)	
Drill Parameters:				Pump:	
ROP		WOB		GPM	
1 m/hr		1000 kg		10	
				PSI	
				350 kpa	
Fluid Type		Time		Depth	
Milgel		17:00		199	
				Viscosity	
				45	
				Density	
				1224 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:					
No.		Size		Type	
5		96 mm		SK - 7	
6 (re-run #1)		96 mm			
				Serial	
				126035	
				From	
				116.74	
				To	
				199	
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.			

Daily (24 Hour) Summary:

- 7:00-12:00 Wait on salt, increase mud density to 10.2 pds / gal
- 12:00-19:00 Spot high Viscosity LCM pill in annulus from 198 to 181 m. Attempting to restore lost circulation, failed. Spot another pill and prepare to POOH.
- 19:00-03:00 P.O.O.H. change HQ drill rods and make up bit, R.I.H. to 181 m circulating down to 199 m. Circulation restored - full returns. BOP drill 50 seconds.
- 03:00-07:00 Drill 96 mm hole from 199 to 201 m.

24 Look Ahead:

Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 15 / 2002		Weather: flurries	
Operator: Vulcan Minerals Inc.		Report #: 8		Temp: - 6 C	
Depth (m): 250		Progress (m): 49		Wind: NW	
Hole Cond: Good		Formation: Codroy Halite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
				Capacity (L/M)	
				Volume (L)	
HQ Rods		82		246	
				4.77	
				1173.42	
BHA		Core Bbl+Bit		3.96	
				4.77	
				18.8892	
				Total: 1192.3	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:		1.031		223.1084	
Csg / HQ:		1.9		56.24	
BHA:					
				Volumes:	
				Surface Vol: 23000	
				Hole Vol: 1471.6576	
				Total Vol: 24471.6576	
				Surveys:	
				Depth Angle	
				65.8 m 0	
				163.1 0	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Open Hole:		96 mm		8.1 L / m	
				29.6 m (97 ft)	
Drill Parameters:		ROP		WOB	
		4.5 m/hr		1200 kg	
		RPM		Pump:	
		250-300		GPM	
				PSI	
				10	
				175	
				SCR	
				15 psi@ 5gpm	
Fluid Type		Time		Depth	
Milgel		1:00		232	
				Viscosity	
				45	
				Density	
				1224 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:		No.		Size	
		7		96 mm	
		Type		Serial	
				Q1947	
		From		To	
		203			
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.			

Daily (24 Hour) Summary:

7:00-8:00 Drill 96 mm hole from 201 to 203 m.
 08:00-09:00 Repair foot clamp and rig service.
 09:00-11:00 P.O.O.H. change bit, R.I.H. to 203 m.
 11:00-19:00 Circulate until full returns observed, drill 96 mm hole from 203 to 214 m.
 19:00-7:00 Drill 96 mm hole from 214 to 250 m. SCR (slow circulation rate) @ 250 m, 5 gpm - 150 psi. B.O.P. drill for 45 sec.

24 Look Ahead:

Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 16 / 2002		Weather: flurries	
Operator: Vulcan Minerals Inc.		Report #: 9		Temp: - 8 C	
Depth (m): 316		Progress (m): 66		Wind: NW	
Hole Cond: 75% returns		Formation: Codroy Halite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Hectar Hewlett Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
				Capacity (L/M)	
				Volume (L)	
HQ Rods		104		104	
BHA - Core Bbl+Bit		3.96		4.77	
				496.08	
				18.8892	
				Total: 514.97	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:		1.031		76.7064	
Csg / HQ:		1.9		56.24	
BHA:					
				Volumes:	
				Surface Vol: 12000	
				Hole Vol: 647.9156	
				Total Vol: 12647.9156	
Casing Data:		O.D.		I.D.	
Conductor: 114.3 mm (HW)		101.6 mm		Capacity	
Open Hole: 96 mm				Shoe	
				8.1 L / m	
				29.6 m (97 ft)	
Drill Parameters:				Pump:	
ROP		WOB		GPM	
~ 3 m/hr		500-600 kg		12	
				PSI	
				160	
				SCR	
				100 psi@ 5gpm	
Fluid Type		Time		Depth	
Milgel		1:00		300 m	
				Viscosity	
				45	
				Density	
				1248 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:					
No.		Size		Type	
7		96 mm		Q1947	
				From	
				203	
				To	
HSE (Health Safety and Environment):		Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.			

Daily (24 Hour) Summary:

7:00-19:00 Drill 96 mm hole from 250 to 277 m.
 19:00-07:00 Drill 96 mm hole from 277 to 316 m. BOP drill 60 seconds.

24 Look Ahead: Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 17 / 2002		Weather: Sunny	
Operator: Vulcan Minerals Inc.		Report #: 10		Temp: - 8 C	
Depth (m): 367		Progress (m): 51		Wind: N	
Hole Cond: 75% returns		Formation: Codroy Halite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Helpers		Rotary	
Night Shift		Helpers		Head: 58.6	
		Driller		Helpers	
		Wayne Kurby		Cal Taylor	
		Laverne Pynn		Derek Taylor	
Drill String:		Capacity (L/M)		Volume (L)	
HQ Rods		121		363	
BHA		4.77		1731.51	
Core Bbl+Bit		4.77		18.8892	
Annulus:		Volumes:		Surveys:	
OH / HQ:		Surface Vol:		Depth	
1.031		8000		Dev	
Csg / HQ:		Hole Vol:		65.8 m	
1.9		2150.3746		0	
BHA:		Total Vol:		163.1 m	
		10150.3746		0	
Casing Data:		Capacity		Shoe	
Conductor:		8.1 L / m		29.6 m (97 ft)	
Open Hole:		114.3 mm (HW)		101.6 mm	
96 mm					
Drill Parameters:			Pump:		
ROP			GPM		
2.5 m/hr			12		
WOB			PSI		
500-600 kg			160		
RPM			SCR		
250-300			100 psi@ 5gpm		
Fluid Type		Time		Depth	
Milgel		1:00		300 m	
				Viscosity	
				45	
				Density	
				1248 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:					
No.					
7					
Size					
96 mm					
Type					
Serial					
Q1947					
From					
203					
To					
367					
HSE (Health Safety and Environment):					
Drilling personnel had regular "toolbox" meeting at shift exchange as well as BOP drill.					

Daily (24 Hour) Summary:

7:00-14:00 Drill 96 mm hole from 316 to 333 m.
 14:00-15:00 Rig repair - Changed cross head on drill
 15:00-19:00 Drill 96 mm hole from 333 to 347 m.
 19:00-04:00 Drill 96 mm hole from 347 to 367 m.
 04:00-07:00 Excessive torque on drill detected - circulated hole for 3 hours to close upper zone presumably closing in on rods.

24 Look Ahead:

Circulate and prepare hole for cementing later in day.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 18/2002		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 11		Temp: - 8 C	
Depth (m): 367		Progress (m): 540		Wind: N	
Hole Cond: Good		Formation: Anhydrite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Helpers		Rotary	
Night Shift		Helpers		Head: 58.6	
		Driller		Helpers	
		Wayne Kurby		Hector Hewlin	
		Laverne Pynn		Cal Taylor	
		Lloyd Stuckless		Derek Taylor	
Drill String:		Capacity (L/M)		Volume (L)	
Joints		Length (m)		Total:	
HQ Rods		121		363	
BHA - Core Bbl+Bit		3.96		4.77	
		1731.51		18.8892	
		1731.51		1750.4	
Annulus:		Surveys:			
Litres / Meter		Volume (L)		Depth	
OH / HQ:		1.031		343.7354	
Csg / HQ:		1.9		56.24	
BHA:		8000		65.8 m	
		2150.3746		0	
		10150.3746		163.1 m	
				0	
Casing Data:		Capacity		Shoe	
O.D.		I.D.			
Conductor: 114.3 mm (HW)		101.6 mm		8.1 L / m	
Surface Csg 88.9mm		77.8mm		29.6 m (97 ft)	
		4.77l/m		367m	
Drill Parameters:		Pump:			
ROP		WOB		RPM	
				GPM	
				PSI	
				SCR	
		Jan-00		160	
				100psi@5gpm	
Fluid Type		Time		Depth	
Milgel		10:00		367	
				Viscosity	
				45	
				Density	
				1248 kg/m3	
				pH	
				8 - 8.5	
				W. L.	
Bit Data:					
No.					
7					
Size					
96 mm					
Type					
Serial					
Q1947					
From					
203					
To					
367					
HSE (Health Safety and Environment): Drilling personnel had regular toolbox meeting at shift change as well as BOP drill. Held pre-cementing safety meeting with all crews involved.					

Daily (24 Hour) Summary:

7:00-10:00 Continued circulating and pumping high viscosity "pills" @ 367 m.
 10:00-11:00 P.O.O.H. to 337 m.
 11:00-12:00 Circulate and pump high viscosity pills to clean hole.
 12:00-14:00 Wait on cross over (equipment part) from Springdale.
 14:00-15:00 Make up cross over and 10 NW joints - 30 m, R.I.H. to 367 m.
 15:00-17:30 Circulate bottoms up, rig up for cement job. Held safety meeting with all crews involved.
 17:30-19:00 Pump 800 L of Class G Portland cement (15.2 pds/gal). Mix with 10.2 pds/gal brine, 200% open hole volume. Drop wiper plug. Displace with 1700 L of fresh water leaving ~10 m of cement in casing - Returns to surface with 600 psi. Close in well.
 19:00-7:00 Wait on cement

24 Hour Look Ahead:

Wait on cement and prepare to "nipple up" BOP's.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 19/2002		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 12		Temp: - 8 C	
Depth (m): 367		Progress (m): 0		Wind: N	
Hole Cond: Good		Formation: Anhydrite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Jarret Simon	
Night Shift		Laverne Pynn		Lloyd Stuckless	
				Cal Taylor	
				Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
HQ Rods		121		363	
BHA		Core Bbl+Bit		3.96	
				Capacity (L/M)	
				4.77	
				Volume (L)	
				1731.51	
				18.8892	
				Total: 1750.4	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:		1.031		343.7354	
Csg / HQ:		1.9		56.24	
BHA:					
				Volumes:	
				Surface Vol: 8000	
				Hole Vol: 2150.3746	
				Total Vol: 10150.3746	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Surface Csg		88.9mm		77.8mm	
				Capacity	
				8.1 L / m	
				4.77l/m	
				Shoe	
				29.6 m (97 ft)	
				367m	
Drill Parameters:			Pump:		
ROP			GPM		
WOB			PSI		
RPM			SCR		
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:					
No.		Size		Type	
7		96 mm		Q1947	
				From	
				203	
				To	
				367	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

7:00-12:00 Dismantle casing bowl and divertor assembly.
 12:00-19:00 Prepare choke manifold & choke line for pressure test.
 19:00-24:00 Prepare to nipple up BOP's.
 24:00-7:00 Wait on parts

24 Hour Look Ahead: Wait on parts to "nipple up" BOP's.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 20/2002		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 13		Temp: -2 C	
Depth (m): 367		Progress (m): 0		Wind: N	
Hole Cond: Good		Formation: Anhydrite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Jarret Simon	
Night Shift		Laverne Pynn		Lloyd Stuckless	
				Cal Taylor	
				Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
HQ Rods				0	
BHA		Core Bbl+Bit		0	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:				0	
Csg / HQ:				0	
BHA:				0	
Annulus:		Volumes:		Surveys:	
		Surface Vol: 8000		Depth Dev	
		Hole Vol: 0		65.8 m 0	
		Total Vol: 8000		163.1 m 0	
Casing Data:		O.D.		I.D.	
Conductor: 114.3 mm (HW)				101.6 mm	
Surface Csg 88.9mm				77.8mm	
		Capacity		Shoe	
		8.1 L / m		29.6 m (97 ft)	
		4.77L/m		367m	
Drill Parameters:			Pump:		
ROP		WOB		RPM	
		GPM		PSI	
				SCR	
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:					
No.		Size		Type	
7		96 mm		Q1947	
				From	
				203	
				To	
				367	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

7:00-19:00 Test choke manifold - Fail
 19:00-7:00 Wait on parts. Drilling operations temporarily suspended, 24 hour rig watch in place.

24 Hour Look Ahead: Wait on parts to "nipple up" BOP's.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 21/2002		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 14		Temp: -2 C	
Depth (m): 367		Progress (m): 0		Wind: N	
Hole Cond: Good		Formation: Anhydrite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Jarret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
Rotary Head: 58.6					
Drill String:		Joints		Length (m)	
HQ Rods				Capacity (L/M)	
BHA - Core Bbl+Bit				Volume (L)	
				Total: 0	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:				0	
Csg / HQ:				0	
BHA:				0	
Surveys:				Depth	
				65.8 m	
				163.1 m	
				0	
				0	
Casing Data:		O.D.		I.D.	
Conductor: 114.3 mm (HW)				101.6 mm	
Surface Csg 88.9mm				77.8mm	
		Capacity		Shoe	
		8.1 L / m		29.6 m (97 ft)	
		4.77L/m		367m	
Drill Parameters:		ROP		WOB	
		RPM		Pump:	
				GPM	
				PSI	
				SCR	
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:		No.		Size	
		7		96 mm	
		Type		Serial	
				Q1947	
		From		To	
		203		367	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

7:00-7:00 Wait on parts.

24 Hour Look Ahead:

Wait on parts to "nipple up" BOP's.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 22/2002		Weather: Stormy	
Operator: Vulcan Minerals Inc.		Report #: 15		Temp: -6 C	
Depth (m): 367		Progress (m): 0		Wind: NE	
Hole Cond: Good		Formation: Anhydrite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Jarret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
Rotary Head: 58.6					
Drill String:		Joints		Length (m)	
HQ Rods				Capacity (L/M)	
BHA		Core Bbl+Bit		Volume (L)	
				0	
				0	
Annulus:		Litres / Meter		Volume (L)	
OH / HQ:				0	
Csg / HQ:				0	
BHA:					
Volumes:					
Surface Vol:				8000	
Hole Vol:				0	
Total Vol:				8000	
Surveys:					
				Depth	
				Dev	
				65.8 m	
				0	
				163.1 m	
				0	
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Surface Csg		88.9mm		77.8mm	
				Capacity	
				Shoe	
				8.1 L / m	
				29.6 m (97 ft)	
				4.77L/m	
				367m	
Drill Parameters:			Pump:		
ROP		WOB		RPM	
				GPM	
				PSI	
				SCR	
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:					
No.		Size		Type	
7		96 mm		Q1947	
				From	
				To	
				203	
				367	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

7:00-10:00 Wait on parts.
 10:00-7:00 Nipple up BOP's and assemble choke manifold, flare line, & accumulator system.

24 Hour Look Ahead: Continuing nipple up of BOP's.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 23/02		Weather: Sunny	
Operator: Vulcan Minerals Inc.		Report #: 16		Temp: - 8 C	
Depth (m):		Progress (m):		Wind:	
Hole Cond: Good		Formation: Codroy Halite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Garret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
NQ Rods				Capacity (L/M) 2.85	
BHA - Core Bbl+Bit				Volume (L) 0	
Annulus:		Litres / Meter		Volume (L)	
Csg / NQ:		0.92		337.64	
OH / NQ:		0.66		-242.22	
BHA:					
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Surface Csg:		88.9 mm (HQ)		77.8 mm	
				Capacity (L/M) 8.1	
				Shoe (m) 29.6	
				4.77	
				367	
Drill Parameters:		ROP		WOB	
		RPM		Pump:	
				GPM	
				PSI	
				SCR	
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:		No.		Size	
		7		96 mm	
				Type	
				Serial	
				From	
				To	
				Q1947	
				203	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

7:00-19:00 Complete "nipple up" of BOP's. Assemble flare line to choke manifold. Complete ramp for drill floor

19:00-23:00 Assemble accumulator unit.

23:00-7:00 Function test accumulator. With pump off - open HCR, close blind rams, close pipe rams, close annular, 1100 psi. Precharge remaining.
 Recharge to 1500 psi - 2 min.
 Set test plug. Test BOP's. Blind rams - low 200 psi, high 1500 psi, 15 min - ok.
 Pipe rams - HCR - Kill line - low 200 psi, high 1500 psi, 15 min - ok.
 Annular, low 200 psi, high 100 psi, 15 min - ok.

24 Look Ahead:

Drill ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 24/02		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 17		Temp: - 8 C	
Depth (m):		Progress (m):		Wind: SW	
Hole Cond: Good		Formation: Evaporite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Helpers		Helpers	
Day Shift Wayne Kurby		Garret Simon		Cal Taylor	
Night Shift Laverne Pynn		Lloyd Stuckless		Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Length (m)		Volume (L)	
NQ Rods		2.85		0	
BHA - Core Bbl+Bit		2.85		0	
Annulus:		Volume (L)		Volumes (L):	
Csg / NQ: 0.92		337.64		Surface Vol: 17000	
OH / NQ: 0.66		-242.22		Hole Vol: 95.42	
BHA:				Total Vol: 17095.42	
Surveys:				Depth Dev	
				65.8 m 0	
				163.1 0	
Casing Data:		Capacity (L/M)		Shoe (m)	
Conductor: 114.3 mm (HW)		8.1		29.6	
Surface Csg: 88.9 mm (HQ)		4.77		367	
Drill Parameters:			Pump:		
ROP WOB RPM			GPM PSI SCR		
Fluid Type		Time		Depth	
				Viscosity Density pH W. L.	
Bit Data:		No.		Size	
		7		96 mm	
		8		75.7 mm	
				Type Serial From To	
				Shark 7 Q1947 203 367	
				Shark 7 19838-11 367	
HSE (Health Safety and Environment):					

Daily (24 Hour) Summary:

07:00-10:00 Pressure test surface casing against blind ram utilizing casing bowl nipple - 700 psi down to 250 psi - 15 min. Re-test - same results.
Pressure test against pipe ram and HCR - same result.

10:00-19:00 Pressure test choke manifold, all valves V1-V7 plus 2 chokes, low 200 psi against pipe rams and blind rams through choke line - ok.
Pressure test choke manifold via choke line, all valves V1-V7 plus two chokes, high 1500 psi - ok.
Test Procedure: high / low pressure tests, **test #1** - V1, V2, V3, **test #2** - V1, V3, left choke, **test #3** - V4, V1, V3, **test #4** - V1, V3, V5, V6, **test #5** - V1, V2, right choke, **test #6** - V1, V2, V7.
(See attached manifold sketch.)

19:00-24:00 Work on trip tank, stake flare lines & choke lines.

24:00-03:00 Repair water pump.

03:00-05:00 Make up 75.7 mm bit (19838-11), R.I.H. to 140 m.

05:00-07:00 Repair water pump.

24 Hour Look Ahead:

R.I.H. tag cement and await further instruction.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 25/02		Weather: Sunny	
Operator: Vulcan Minerals Inc.		Report #: 18		Temp: - 8 C	
Depth (m):		Progress (m):		Wind:	
Hole Cond: Good		Formation: Evaporite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Helpers		Rotary	
Night Shift		Helpers		Head: 58.6	
		Garret Simon		Cal Taylor	
		Lloyd Stuckless		Derek Taylor	
Drill String:		Capacity (L/M)		Volume (L)	
Joint		Length (m)			
NQ Rods 119		355.76		2.85 1013.916	
BHA - Core Bbl+Bit		7.24		2.85 20.634	
Annulus:		Volumes (L):		Surveys:	
Litres / Meter		Volume (L)		Depth Dev	
Csg / NQ: 0.92		337.64		Surface Vol: 17000	
OH / NQ: 0.66		-2.64		Hole Vol: 1369.55	
BHA:		Total Vol: 18369.55		163.1 0	
Casing Data:		Capacity (L/M)		Shoe (m)	
O.D.		I.D.			
Conductor: 114.3 mm (HW)		101.6 mm		8.1 29.6	
Surface Csg: 88.9 mm (HQ)		77.8 mm		4.77 367	
Drill Parameters:		Pump:			
ROP		WOB		RPM	
				GPM PSI SCR	
				10-12 100	
Fluid Type		Time		Depth	
Viscosity		Density		pH W. L.	
Milgel		1:00		363 40 10.1 8-8.5	
Bit Data:		No.		Size	
				Type Serial From To	
		7		96 mm Shark 7 Q1947 203 367	
		8		75.7 mm Shark 7 19838-11 367	
HSE (Health Safety and Environment):		BOP drill.			

Daily (24 Hour) Summary:

07:00-09:00 R.I.H. from 140 m to 343.24 m, tag cement.

09:00-11:00 Hook up flare line.

11:00-13:00 Change out water supply pump.

13:00-15:00 Change flowline to prepare to drill out cement.

15:00-17:00 Drilling out cement from 343.24 m to 358 m. BOP drill.

17:00-19:00 Pressure test surface casing.
600 psi down to 375 psi - 15 min. ~ 0.5 L of fluid lost (volume decrease).

19:00-22:00 P.O.O.H., intertube unable to pass through rods, laid out 5 damaged rods.
R.I.H. to 358 m.

22:00-23:00 Drill out cement from 358 m to 363 m.

24:00-01:00 Pressure test surface casing, same results, 600 psi - 375 psi - 15 min - ok.

01:00-04:00 Circulate, displace hole with drilling fluid (brine).

04:00-07:00 Circulate.

24 Hour Look Ahead:

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 26/02		Weather: Sunny	
Operator: Vulcan Minerals Inc.		Report #: 19		Temp: - 8 C	
Depth (m): 382		Progress (m): 15		Wind: S	
Hole Cond: Good		Formation: Evaporite		Roads: Snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Driller	Helpers	Helpers	Rotary Head: 58.6
Night Shift		Wayne Kurby	Garret Simon	Cal Taylor	
		Laverne Pynn	Lloyd Stuckless	Derek Taylor	
Drill String:		Joints	Length (m)	Capacity (L/M)	Volume (L)
NQ Rods		125	374.8	2.85	1068.18
BHA - Core Bbl+Bit		7.24		2.85	20.634
Annulus:		Litres / Meter	Volume (L)	Volumes (L):	
Csg / NQ:		0.92	337.64	Surface Vol: 17000	
OH / NQ:		0.66	9.9264	Hole Vol: 1436.3804	
BHA:				Total Vol: 18436.3804	
Casing Data:		O.D.	I.D.	Capacity (L/M)	Shoe (m)
Conductor:		114.3 mm (HW)	101.6 mm	8.1	29.6
Surface Csg:		88.9 mm (HQ)	77.8 mm	4.77	367
Drill Parameters:			Pump:		
ROP (m/hr)	WOB (pds)	RPM	LPM	PSI	SCR
3	2000	400	60	175	20 L/M @ 100 psi 40 L/Min @140 psi
Fluid Type	Time	Depth	Viscosity	Density	pH
Milgel	1:00	376	40	1224 kg/m3	8-8.5
Bit Data:		No.	Size	Type	Serial
		8	75.7 mm	Shark 7	19838-11
		9	75.7	Polycrystalline	U 103
					From
					To
					367
					376
HSE (Health Safety and Environment):			Discussed shut-in procedures prior to drilling out shoe, regular BOP drill.		

Daily (24 Hour) Summary:

07:00-12:00 Install float in trip tank, modifications in flow line. Tie in kill line to casing bowl.

12:00-14:30 Install 2nd furnace.

14:30-18:00 BOP drill prior to drilling out. Drill out casing shoe and HQ bit.

18:00-19:00 Drill 75.7 mm hole from 369 to 370 m.

19:00-20:00 Drill 75.7 mm hole from 369 to 372 m.

20:00-21:00 Circulating (BOP drill).

21:00-22:00 Formation Integrity Test: Depth 372 m, mud density = 1224 kg/m3 (pds/gal)
Pull up inside csg to 366 m, close pipe rams. Applied surface pressure, 325 psi (18 kpa / m gradient)-15 min. Pressure drop 325 - 225 psi (consistent with Surface Csg test). MCAP - 325 psi, EMD - 1836 kg/m3 - 15.3 ppg.

22:00-24:00 Drill 75.7 mm hole from 372 -376 m.

24:00-04:00 Tripping.

04:00-05:00 Survey @ 376 m, deviation 0 deg.

05:00-07:00 Drill 75.7 mm hole from 376 to 382 m.

24 Hour Look Ahead:

Drill Ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 27/02		Weather: Cloudy			
Operator: Vulcan Minerals Inc.		Report #: 20		Temp: - 14 C			
Depth (m): 454		Progress (m): 72		Wind: Windy			
Hole Cond: Good		Formation: Anhydrite		Roads: Flurries			
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)			
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00			
Day Shift		Driller	Helpers	Helpers	Rotary Head: 58.6		
Night Shift		Wayne Kurby	Garret Simon	Cal Taylor			
Drill String:		Length (m)	Capacity (L/M)	Volume (L)			
NQ Rods		150	447	2.85 1273.95			
BHA - Core Bbl+Bit		7.24	2.85	20.634			
Annulus:		Litres / Meter	Volume (L)	Volumes (L):			
Csg / NQ:		0.92	337.64	Surface Vol: 17000			
OH / NQ:		0.66	57.5784	Hole Vol: 1689.8024			
BHA:				Total Vol: 18689.8024			
Casing Data:		O.D.	I.D.	Capacity (L/M)	Shoe (m)		
Conductor:		114.3 mm (HW)	101.6 mm	8.1	29.6		
Surface Csg:		88.9 mm (HQ)	77.8 mm	4.77	367		
Drill Parameters:			Pump:				
ROP (m/hr)	WOB (pds)	RPM	LPM	PSI	SCR		
3	2000	700	40.00	425	20 L/M @ 100 psi 40 L/Min @140 psi		
Fluid Type	Time	Depth	Viscosity	Density	pH	W. L.	
Milgel	4:00	444	40	1224 kg/m3	8-8.5		
Bit Data:		No.	Size	Type	Serial	From	To
		8	75.7 mm	Shark 7	19838-11	367	376
		9	75.7	Polycrystalline	U 103	376	
HSE (Health Safety and Environment):			Held discussion with drill crew regarding shut-in procedures, conducted regular BOP drill.				

Daily (24 Hour) Summary:

07:00-19:00 Drill 75.7 mm from 382 to 418 m.
 19:00-07:00 Drill 75.7 mm from 418 to 454 m.

24 Hour Look Ahead:

Drill Ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 28/02		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 21		Temp: - 6 C	
Depth (m): 508		Progress (m): 54		Wind:	
Hole Cond: Good		Formation: Anhydrite		Roads: snow	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Garret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
				Capacity (L/M)	
				Volume (L)	
NQ Rods		167		500.76	
				2.85	
BHA		- Core Bbl+Bit		7.24	
				2.85	
				20.634	
Annulus:		Litres / Meter		Volume (L)	
Csg / NQ:		0.92		337.64	
OH / NQ:		0.66		93.06	
BHA:					
Casing Data:		O.D.		I.D.	
				Capacity (L/M)	
				Shoe (m)	
Conductor:		114.3 mm (HW)		101.6 mm	
				8.1	
Surface Csg:		88.9 mm (HQ)		77.8 mm	
				4.77	
				29.6	
				367	
Drill Parameters:				Pump:	
ROP (m/hr)		WOB (pds)		LPM	
RPM				PSI	
				SCR	
2.6		2000		40.00	
				500-525	
				20 L/M @ 100 psi	
				40 L/Min @450 psi	
Fluid Type		Time		Depth	
Viscosity		Density		pH	
W. L.					
Milgel		19:00		478	
				39	
				1224 kg/m3	
				8-8.5	
Bit Data:		No.		Size	
				Type	
				Serial	
				From	
				To	
		8		75.7 mm	
				Shark 7	
		9		75.7	
				Polycrystalline	
				U 103	
				367	
				376	
HSE (Health Safety and Environment):		Function Tests and regular shift BOP drill.			

Daily (24 Hour) Summary:

07:00-19:00 Drill 75.7 mm hole from 454 to 478 m.
 19:00-22:00 Drill 75.7 mm hole from 478 to 487 m.
 22:00-24:00 Hook up and install 2nd remote control BOP stand. Function Test - HCR Valve, Pipe Rams, Annular Preventer, & Accumulator unit. BOP drill, and held discussions regarding shut-in procedures. Regular flow checks before, during, and following core retrieval.
 24:00-07:00 Drill 75.7 mm hole from 487 to 508 m.

24 Hour Look Ahead:

Drill Ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 29/02		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 22		Temp: - 2 C	
Depth (m): 574		Progress (m): 66		Wind:	
Hole Cond: Good		Formation: Anhydrite		Roads: Dry	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
Drilling Personnel:		Drilling Rep: Barry Matthews		Ground: 54.00	
Day Shift		Helpers		Rotary	
Night Shift		Helpers		Head: 58.6	
Drill String:		Capacity (L/M)		Volume (L)	
NQ Rods		189		567	
BHA		-		Core Bbl+Bit	
		7.24		2.85	
				1615.95	
				20.634	
Annulus:		Volumes (L):		Surveys:	
Csg / NQ:		Surface Vol:		Depth	
OH / NQ:		Hole Vol:		Dev	
BHA:		Total Vol:		65.8 m	
		17611.0024		0	
				163.1	
				0	
				376	
				0	
				520	
				0	
Casing Data:		Capacity (L/M)		Shoe (m)	
Conductor:		114.3 mm (HW)		8.1	
Surface Csg:		88.9 mm (HQ)		4.77	
		101.6 mm		29.6	
		77.8 mm		367	
Drill Parameters:		Pump:			
ROP (m/hr)		LPM		PSI	
WOB (pds)		SCR @ 566 m			
RPM		40.00		500-525	
3				20 L/M @ 100 psi	
2000				40 L/Min @450 psi	
500					
Fluid Type		Time		Depth	
Viscosity		Density		pH	
W. L.		Milgel		8:00	
		Milgel		1:00	
				514	
				556	
				40	
				40	
				1260 kg/m3	
				1188 kg/m3	
				8	
				8-8.5	
Bit Data:		No.		Size	
		8		75.7 mm	
		9		75.7	
				Shark 7	
				Polycrystalline	
				U 103	
				19838-11	
				367	
				376	
HSE (Health Safety and Environment):		Regular BOP drill at shift change.			

Daily (24 Hour) Summary:

07:00-19:00 Drill 75.7 mm hole from 508 to 538 m. **Survey:** 0 deg. dev @ 520 m
 19:00-07:00 Drill 75.7 mm hole from 538 to 574 m.

24 Hour Look Ahead:

Drill Ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 30/02		Weather: Cloudy	
Operator: Vulcan Minerals Inc.		Report #: 23		Temp: -8 C	
Depth (m): 605.2 (Total Depth)		Progress (m): 31.2		Wind:	
Hole Cond: Good		Formation: Granitoid		Roads: Dry	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Garret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Joints		Length (m)	
NQ Rods		200		598	
BHA		Core Bbl+Bit		7.24	
				Capacity (L/M)	
				2.85	
				20.634	
Annulus:		Litres / Meter		Volume (L)	
Csg / NQ:		0.92		337.64	
OH / NQ:		0.66		157.2384	
BHA:					
Casing Data:		O.D.		I.D.	
Conductor:		114.3 mm (HW)		101.6 mm	
Surface Csg:		88.9 mm (HQ)		77.8 mm	
				Capacity (L/M)	
				8.1	
				29.6	
				4.77	
				367	
				Shoe (m)	
				376	
				520	
				0	
				0	
				0	
				0	
Drill Parameters:		ROP (m/hr)		WOB (pds)	
		3		2000	
		RPM		500	
Pump:		LPM		PSI	
		40.00		500-525	
				SCR @ 566 m	
				20 L/M @ 100 psi	
				40 L/Min @450 psi	
Fluid Type		Time		Depth	
Milgel		17:00		604	
				Viscosity	
				40	
				Density	
				1260 kg/m3	
				pH	
				8	
				W. L.	
Bit Data:		No.		Size	
		8		75.7 mm	
		9		75.7	
				Type	
				Shark 7	
				Serial	
				19838-11	
				From	
				367	
				To	
				376	
				605.2	
HSE (Health Safety and Environment):		Regular BOP drills at shift change.			

Daily (24 Hour) Summary:

07:00-09:00 Drill 75.7 mm hole from 574 to 580 m.
 9:00-11:00 Function test BOP's, re-fill choke line & manifold with antifreeze.
 11:00-18:00 Drill 75.7 mm hole form 580 to 605.2 m.
 18:00-19:00 Circulate bottoms up, flow check, retrieve core.
 19:00-21:00 Evaluate core, conclude basement rock intersected - Total Depth. Circulate and prepare to P.O.O.H.
 21:00-24:00 P.O.O.H. to 15 m below shoe - 382 m - circulate.
 Night shift rotated to day shift @ 24:00 hrs.
 24:00-07:00 Stand by - Prepare to cement and abandon well.

24 Hour Look Ahead:

Drill Ahead.

DAILY DRILLING REPORT

Well Name: Captain Cook #1		Date: Jan. 31/02		Weather: Storm	
Operator: Vulcan Minerals Inc.		Report #: 24		Temp: - 15 C	
Depth (m): 605.2 (Total Depth)		Progress (m):		Wind:	
Hole Cond: Plugged		Formation: TD		Roads: Drifts	
Drilling Superintendent: Bill Williams (709) 673-7527		Contractor: Petro		Elevations (m)	
		Drilling Rep: Barry Matthews		Ground: 54.00	
Drilling Personnel:		Driller		Helpers	
Day Shift		Wayne Kurby		Garret Simon Cal Taylor	
Night Shift		Laverne Pynn		Lloyd Stuckless Derek Taylor	
				Rotary Head: 58.6	
Drill String:		Length (m)		Capacity (L/M)	
NO Rods				Volume (L)	
BHA - Core Bbl+Bit					
Annulus:		Litres / Meter		Volume (L)	
Csg / NQ:				Volumes (L):	
OH / NQ:				Surface Vol: 14000	
BHA:				Hole Vol: 0	
				Total Vol: 14000	
Casing Data:		O.D.		I.D.	
Conductor: 114.3 mm (HW)		101.6 mm		8.1	
Surface Csg: 88.9 mm (HQ)		77.8 mm		4.77	
				Shoe (m)	
				376	
				520	
Drill Parameters:		ROP (m/hr)		WOB (pds)	
		RPM		Pump:	
				LPM	
				PSI	
				SCR @ 566 m	
Fluid Type		Time		Depth	
				Viscosity	
				Density	
				pH	
				W. L.	
Bit Data:		No.		Size	
				Type	
				Serial	
				From	
				To	
HSE (Health Safety and Environment): Collect sample of drilling fluid and cutting for analytical tests to verify no haradous chemical are present prior to disposal.					

Daily (24 Hour) Summary:

07:00-09:00 Rig Down: Pump 150 L Class A Cement, 15.8 ppg slurry mix with 113 L of water @ 382 m. Pull pipe slowly to 352 m while cement being displaced through bit to maintain balanced cement plug. Displace with 1190 L of brine. Pull pipe to 330 m, circulate 30 min.

9:00-15:00 R.I.H. to 352 m, tag cement & set string weight on cement plug to ensure set-up.

15:00-17:00 P.O.O.H. to 15 m.
Pump 45 L of cement slurry 15.8 ppg, displace with brine while pulling pipe.

17:00-19:00 Rig Down.

19:00-07:00 Rig watch.

24 Hour Look Ahead:

De-mobilization.

APPENDIX IV
DRILL BIT RECORD

CAPTAIN COOK #1

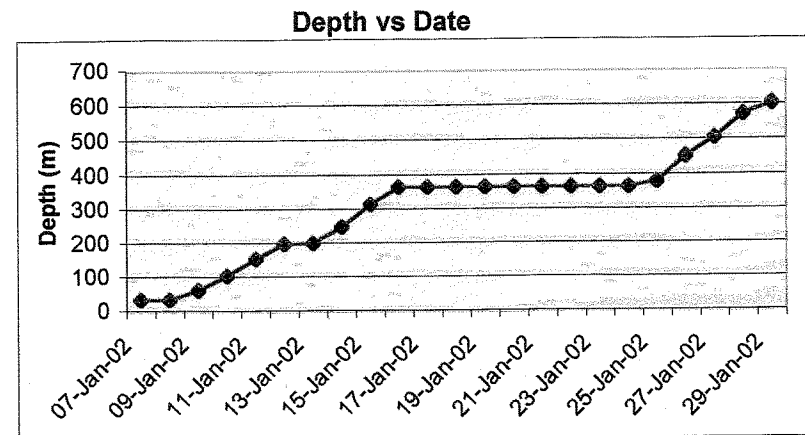
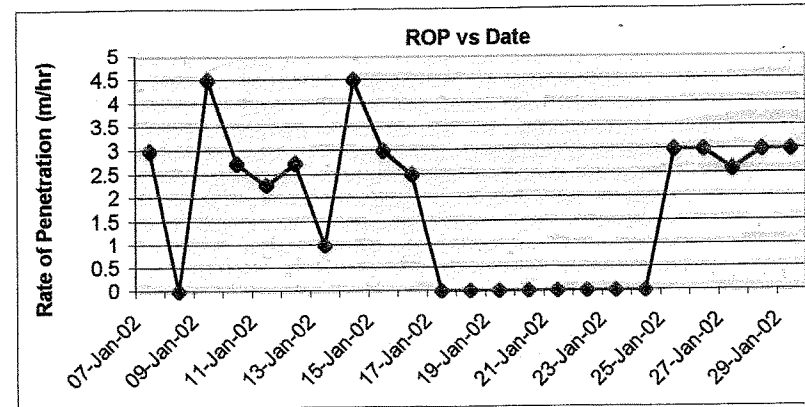
Bit Record

<u>Bit</u>	<u>Size</u>	<u>Type</u>	<u>Serial #</u>	<u>Depth In</u>	<u>Depth Out</u>
1	96 mm	Polycrystalline	Q1948	15	37.5
2	96 mm	#2	Q1846-1	37.5	61.9
3	96 mm	Dimatek	N/A	61.9	73.15
4	96 mm	SK - 7	7535	73.15	123
5	96 mm	SK - 7	126035	123	199
6	96 mm	Polycrystalline	Q1948	199	203
7	96 mm	Shark 7	Q1947	203	367
8	75.7 mm	Shark 7	19838-11	367	376
9	75.7	Polycrystalline	U 103	376	605.2

APPENDIX V
COMPOSITE WELL RECORD

COMPOSITE WELL RECORD CAPATIN COOK #1

<u>Date</u>	<u>Progress Depth (m)</u>	<u>Drill Hole Depth (m)</u>	<u>Rates of Penetration (ROP's) Meters / Hour (m/hr)</u>
07-Jan-02	4.6	35.7	3
08-Jan-02	0	35.7	0
09-Jan-02	26.2	61.9	4.5
10-Jan-02	42.6	104.5	2.75
11-Jan-02	51.3	155.8	2.28
12-Jan-02	43.2	199	2.75
13-Jan-02	2	201	1
14-Jan-02	49	250	4.5
15-Jan-02	66	316	3
16-Jan-02	51	367	2.5
17-Jan-02	0	367	0
18-Jan-02	0	367	0
19-Jan-02	0	367	0
20-Jan-02	0	367	0
21-Jan-02	0	367	0
22-Jan-02	0	367	0
23-Jan-02	0	367	0
24-Jan-02	0	367	0
25-Jan-02	15	382	3
26-Jan-02	72	454	3
27-Jan-02	54	508	2.6
28-Jan-02	66	574	3
29-Jan-02	31.2	605.2	3



APPENDIX VI
STRATIGRAPHIC COLUMN

VULCAN MINERALS INC. - CAPTAIN COOK # 1
STRATIGRAPHIC SECTION

Depth	Lithology	Depth Intervals		Brief Description
		(from)	(to)	
0	Overburden	0	16.5	
10				
20				
30		29.6		Conductor Pipe Shoe @ 29.6 m
40	SS / Cgl	16.5	197.5	Codroy Group
50				
60				
70				
80				
90				
100				
110				
120				
130				
140				
150				
160				
170			Mdst / Shale	
180	Mdst / Shale	166.7	197.5	Red to brown, very poorly indurated, & lithified mudstone - muddy shale
190				
200				
210	Salt	197.5	357.5	Codroy Group Evaporite Sequence
220				
230				
240				
250				
260				
270				
280				
290				
300				
310				
320				
330				
340				
350				
360			Anhydrite	
370	Anhydrite			Surface Hole Shoe @ 367 m
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				
510				
520				
530				
540				
550				
560				
570			Ship Cove	
580			Limestone:	
590			Algal Stromatolitic Ls grading to limy shale	
600	Limestone			@ 597 m
610	Granitoid (Bsmt)			Granitoid Basement Rocks @ 604 m

Total Depth: 605. 2 m, Jan. 29/02 @ 18:00 hrs

APPENDIX VII
CORE BOX INTERVALS

CORE BOXES

Core Box #	Meterage		Core Box #	Meterage	
	to	from		to	from
1	29.6	32.78	52	179.8	182.8
2	32.8	35.8	53	182.8	185.8
3	35.8	38.8	54	185.8	188.8
4	38.8	41.8	55	188.8	192.2
5	41.8	44.8	56	192.2	195.4
6	44.8	47.8	57	195.4	198.4
7	47.8	50.8	58	198.4	201.6
8	50.8	53.8	59	201.6	205.4
9	53.8	56.8	60	205.4	208.4
10	56.8	59.8	61	208.4	211.4
11	59.8	62.8	62	211.4	214.6
12	62.8	65.8	63	214.6	218
13	65.8	68.8	64	218	221
14	68.8	71.8	65	221	224.1
15	71.8	74.8	66	224.1	227.3
16	74.8	77.5	67	227.3	230.3
17	77.5	80.8	68	230.3	233.3
18	80.8	83.6	69	233.3	236.4
19	83.6	86.8	70	236.4	239.5
20	86.8	89.8	71	239.5	242.5
21	89.8	92.8	72	242.5	245.5
22	92.8	95.8	73	245.5	248.5
23	95.8	98.8	74	248.5	251.4
24	98.8	101.5	75	251.4	254.4
25	101.5	104	76	254.4	257.4
26	104	107.2	77	257.4	260.4
27	107.2	110.4	78	260.4	263.6
28	110.4	113.4	79	263.6	266.8
29	113.4	116.8	80	266.8	269.9
30	116.8	119.8	81	269.9	272.9
31	119.8	122.6	82	272.9	275.9
32	122.6	125.3	83	275.9	279.6
33	125.3	128.3	84	279.6	282.7
34	128.3	131.2	85	282.7	285.7
35	131.2	133.9	86	285.7	288.8
36	133.9	136.8	87	288.8	291.8
37	136.8	139.3	88	291.8	294.9
38	139.3	141.3	89	294.9	297.9
39	141.3	144.3	90	297.9	301.2
40	144.3	147	91	301.2	304.5
41	147	149.6	92	304.5	307.5
42	149.6	152.4	93	307.5	310.7
43	152.4	155.4	94	310.7	313.8
44	155.4	158.1	95	313.8	316.8
45	158.1	160.8	96	316.8	320
46	160.8	163.7	97	320	323.4
47	163.7	166.7	98	323.4	326.4
48	166.7	170	99	326.4	329.5
49	170	173.2	100	329.5	332.6
50	173.2	176.2	101	332.6	335.9
51	176.2	179.8	102	335.9	339

CORE BOXES

Core Box #	to	from	Core Box #	to	from
103	339	342.3	154	550	554.5
104	342.3	345.4	155	554.5	559
105	345.4	348.6	156	559	563.5
106	348.6	351.7	157	563.5	568
107	351.7	354.9	158	568	572.5
108	354.9	357.9	159	572.5	577
109	357.9	361	160	577	581.5
110	361	364	161	581.5	585.5
111	364	367	162	585.5	589.5
112	367.3	372.3	163	589.5	593.4
113	372.3	376.8	164	593	597.5
114	376.8	380.9	165	597.5	602
115	380.9	385.1	166	602	605.2
116	385.1	389.5			
117	389.5	393.7			
118	393.7	398			
119	398	402.4			
120	402.4	406.6			
121	406.6	411			
122	411	415.5			
123	415.5	419.8			
124	419.8	424.1			
125	424.1	428.5			
126	428.5	433			
127	433	437.5			
128	437.5	441.9			
129	441.9	446.5			
130	446.5	450			
131	450	454.4			
132	454.4	459			
133	459	463			
134	463	467.5			
135	467.5	472			
136	472	476.5			
137	476.5	480.5			
138	480.5	484.5			
139	484.5	489			
140	489	493.1			
141	493.1	497.5			
142	497.5	502			
143	502	506.3			
144	506.3	510.8			
145	510.8	515.3			
146	515.3	519.5			
147	519.5	523.5			
148	523.5	528			
149	528	532.2			
150	532.2	536.6			
151	536.6	541			
152	541	545.5			
153	545.5	550			

APPENDIX VIII
DRILL CORE LOG

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
0	29.6	Overburden	Surface Casing - Conductor Pipe: 114. 3 mm @ 29.6 m Drilled Out - Jan. 7, 2002		
29.6	35	SS / Cgl	<p>Red - brown to mottled white in part, very coarse grained quartzose sandstone grading to conglomerate in part. Majority (85%) of unit is defined by moderately sorted, sub-angular to sub-rounded quartz grains sometimes containing large subrounded 3-5 cm pebbles / clasts of dark shale or chert (10%), and lesser white to partially grey, sub-angular quartz fragments. Short 20-50 cm zones of clast supported conglomerates are common (ie. 32.2 m), typically dominated by dark, melanocratic pebbles, apparently shale. Consistent with abundant large pebbles is a lighter coloration and softer character presumably due to an increase in argillaceous material within the matrix. Overall unit appears to be a friable coarse grained sandstone with an argillaceous / shaly cement variably grading to a pebble / cobble conglomerate. Rubbly core zone noted at 33. 2 m likely reflective of a fracture zone parallel t.c.a. Also from 34.1 - 34.75 m another 3-5 cm fracture parallel t.c.a. is observed infilled with a partially lithified argillaceous mud. Collectively these zones may be the source of the loss circulation problem encountered last evening.</p> <p>@ 30 m: Sandstone (100%): White to light pink/red, lower coarse grained to increasingly upper coarse grained, predominantly quartzose, rare to trace dark chert, red-pink argillaceous mud is common adhered to quartz grains, sub-angular - sub-rounded, poorly sorted, range of grain size, abundant red argillaceous / calcareous cement coupled with minor silica cement, poor to fair intergranular porosity (8-10%), no hydrocarbon stain or show.</p>		

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
(from) 35	(to) 44.9 Cgl / SS	<p>Red - brown to mottled white in part, predominantly spotted red, white or, black, pebble dominated conglomerate grading to very coarse grained sandstone in part. Majority of unit contains ~50%, very poorly sorted, variably sized pebbles ranging from 5 mm to 10 cm, composition of the well rounded clasts are predominantly white grey quartz (50%), lesser red and black shale (35%), and a suite of variably colored subangular-subrounded chert clasts (15%). The remainder (50%) of the unit is a coarse grained sandstone making up the matrix between the pebbles. The sand is primarily composed of quartzose and an abundant red-brown argillitic mud with a minor calcareous component. Overall unit is poorly compacted and lithified and appears consistently friable and unconsolidated. Thin fracture zones are common throughout generally parallel t.c.a.</p> <p>@ 35 m: Sandstone (100%): White, minor pink or red in part, predominantly lower coarse grained, 95% quartzose with minor (5%) light and dark chert, sub-rounded to subangular, moderately sorted, very common red brown argillaceous cement with a minor calcareous component, silica cement is also apparent as smaller medium grained, subangular, loose quartzose often adhered to dominant coarse quartzose grains, poor to possibly fair (6-8%) intergranular porosity, no fluorescence or show.</p> <p>Note: 100% SS is perhaps misleading considering the obvious conglomerate character revealed from core, however, observation of cuttings will concentrate on finer grained lithology</p> <p>@ 40 m: Sandstone (100%): White to slightly pink, increasingly upper coarse grained, predominantly quartzose with trace to minor dark chert, predominantly sub-angular, moderately sorted, dominant red argillaceous cement with a consistent calcareous component, unconsolidated and friable but porosity is likely only poor fair (6-8%) due to the red shaly cement, no indication of hydrocarbons.</p>	

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
44.9	51.8	SS	<p>Red - brown to occasionally mottled white, lower coarse grained quartzose sandstone containing increasing dark lithic grains, surrounded by the common red-brown argillaceous cement, sub-rounded fragments and lesser pebbles are relatively common (5-8%), predominantly light and dark chert / shale with lesser white quartz pebbles. Overall sandstone is very similar to that above except for an obvious decrease in fragments and pebbles and an apparent introduction of white clays acting as a secondary cement. Unit remains relatively friable and unconsolidated, dominant argillaceous mud appears to be decreasing.</p> <p>47.8-49.2: 1.4 m of rubbly broken sandstone, presumably reflecting a fracture zone, a similar zone of broken core is observed at 50.8 - 51.7 m. In these zones red, water saturated muds are common.</p> <p>@ 45 m: Sandstone (100%): White, increasingly pink or red in part, lower coarse grained, predominantly quartzose with minor (5%) light and dark chert, sub-rounded to subangular, moderately sorted, very common red brown argillaceous cement with a trace calcareous component, trace silica cement is also observed (when consolidated), friable, unconsolidated, intergranular porosity is blocked by prevalent red mud thus 6-8% porosity is presumed, no indication (stain or show) of hydrocarbons.</p> <p>@ 50 m: As above.</p>		
51.8	53.5	SS/Cgl	<p>Red -brown to spotted white and black in part, lower coarse grained to upper coarse grained, increasingly grading to conglomerate. Majority (80%) of the litholgy is identical to the coarse grained, argillite (cement) rich sands encountered above. The (20%) conglomerate contains smaller 1-2 cm, well rounded, well sorted, white quartz and red & black shale (possibly some chert). Compared to above the pebbles size has significantly decreased and sorting</p>		

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
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Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)		<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
cont...	(to)	SS / Cgl	has improved. Sandstone remains poorly consolidated and friable especially where sand is surrounding and adhered too pebbles within conglomerate. 51.2-51.7 m: Short interval of fractured sandstone containing 10-15% quartz and shale clast within a muddy argillaceous poorly consolidated quartzose sand.		
53.5	56.1	SS	Red brown increasingly grey, fine to medium grained, sublithic sand composed primarily of (75%) quartzose and lesser (25%) dark and light chert, as well as trace-rare feldspar fragments (?), majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, trace calcareous component (HCl effervescence) associated with a common red brown argillaceous cement, silica cement is also observed at the microscopic level. Unit appears harder with a more siliceous cementation than sands intersected above, well consolidated, silica and argillaceous cement collectively decrease and inhibit porosity to ~ 5-6%. Trace subangular fragments and subrounded pebble of dark shale / chert and/or white grey quartz are observed locally. 54.9-55.2: Short interval of broken rubbly core presumably indicative of a fracture zone. @ 55 m: Sandstone (100%): White to light grey, trace pinkish in part, upper fine to lower medium grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace feldspar and argillite grains, rare pyrite, subangular to subrounded, moderate to well sorted, predominantly silica and lesser argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
Note: Red sands in core appear white to grey in dried cuttings suggesting red coloration is a consequence of hydrated muds.					

Lithology Core Log

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Surface Coordinates: 5361953 m N 386825 m E	Rotary Head: 58.6 m	Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs	
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from)	(to)			
56.1	60.3	Cgl / SS Red - pink to increasingly greyish white, spotted white and black in part (fragments), dominated by abundant (>50%) 1-2 cm (trace 3-5 cm) quartz and lesser black and red shale pebbles surrounded by a medium to coarse grained sandstone matrix. Pebbles are moderately sorted, sub-rounded to rounded, and are typically ~ 1 cm in diameter. Remainder of unit is composed primarily of a medium to coarse grained sandstone, similar to other sand in borehole except red argillaceous component is decreasing significantly, instead the quartzose dominated sand is cemented by lighter white clays and increasing silica. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Alternating beds of conglomerates and sandstone likely represent different discrete episodes of deposition.		
		@ 60 m: Sandstone (100%): White to light grey, trace pinkish in part, upper medium to lower coarse grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace feldspar and argillite grains, predominantly subangular, well sorted, predominantly silica and lesser calcareous argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
60.3	60.8	Shale Red to brown, fissile, platy, very poorly indurated or lithified, micromicaeous, soft poorly lithified mudstone, trace rounded pebbles adjacent rubbly broken upper and lower contacts.		
60.8	63.4	Cgl / SS Same as above except for a dominant grey coloration with a red tinge locally.		
63.4	64.7	Shale Red to brown, fissile, very poorly indurated or lithified, soft mudstone, micromicaeous, no visible bedding or laminations due to extremely muddy texture of core samples.		

Lithology Core Log

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Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from) (to)				
cont...		63.5 m & 64.2 m: Short rubbly, gravelly zones - fracture zones.		
64.7	70.2 SS / Sltst	Grey to salt in pepper in part, lower very fine grained sandstone grading primarily to siltstone, predominantly quartzose with lesser yet common dark chert and other lithic grains, majority of grains appear to be well rounded and sorted, red-brown cm-scale laminations are observed locally as well as discrete 10-20 cm red, muddy shale beds. Throughout the core alternating grey and red beds are common reflective of hematized / oxidized beds or zonation within the sedimentary pile. Contacts are relatively clean and abrupt perpendicular t.c.a.		
		@ 65 m: Sandstone / Siltstone (100%): Grey to salt and pepper in part, lower very fine grained to predominantly siltstone, (95%) quartzose with minor (5%) dark chert, trace reddish argillite grains with a calcareous component, subangular to subrounded, well sorted, predominantly silica and lesser argillaceous cement, intergranular porosity is limited by cement, tight to poor (4-6%) porosity, no indication of hydrocarbon.		
		@ 70 m: Sandstone / Siltstone (100%): Grey to salt and pepper in part, lower very fine grained to predominantly siltstone, (95%) quartzose with minor (5%) dark chert, trace reddish argillite grains with a calcareous component, subangular to subrounded, well sorted, predominantly silica and lesser argillaceous cement, intergranular porosity is limited by cement, tight to poor (4-6%) porosity, no indication of hydrocarbon.		
70.2	71.3 SS / Cgl	Grey to reddish brown in part, upper coarse grained, grading to conglomerate, predominantly (1-3 mm) quartzose grains with an increasing sub-lithic component comprised of a suite of fragments, ranging from quartz and chert to red and black shale. Overall unit is moderately sorted and majority of grains are sub-rounded (relatively mature). The grains appear to be cemented		

Lithology Core Log

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Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from) cont...	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
		SS / Cgl	by mainly silica and red (hematized) argillaceous mud within the sand. Larger quartz, shale and chert pebbles are observed as sizable pebbles (1-5 cm) throughout the unit. Overall sand is very similar to alternating sandstones and conglomerates described above. However, with increase in depth the lithologies appear more consolidated and compacted and muddy / sandy conglomerates are better sorted and less energized considering the significant decrease from cobble to pebble sized fragments.	
71.3	74.3	SS	Red to pinkish, grey in part, upper fine to lower medium grained, quartzose sand, with trace dark and light chert, as well as trace-rare red-pink argillite fragments, majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, rare calcareous component (HCl effervescence) associated with a common red brown argillaceous cement, considering the good consolidation silica cement is presumed present. Red to grey coloration is the result of degrees of hematization of argillic cement. Porosity appear to be relatively poor due to the inhibiting silica and argillaceous cement blocking intgranular porosity. Trace 1-3 cm, subangular fragments and subrounded pebble of dark shale / chert and/or white grey quartz are observed locally.	
74.3	76.5	Cgl / SS	Reddish brown trace grey in part, upper coarse grained, grading to conglomerate, (1-3 mm) quartzose grains with an increasing sub-lithic component makes up the sandy matrix cemented by red argillic muds, the conglomerate component of the lithology is comprised of a suite of fragments, ranging from mainly quartz with red and black shale possibly chert. Fragments are predominantly 1-3 cm, with several grains > 5 cm, overall fragments / pebbles are poorly sorted with a sub-angular habit. Contacts with overlying and underlying sandstone are abrupt. Unit resembles similar beds	

Lithology Core Log

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Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from) cont...	(to)	Cgl / SS intersected and described numerous times above.		
		@ 75 m: Sandstone (100%): White to light pink, upper fine to lower medium grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace red argillite grains, predominantly subangular, well sorted, predominantly silica and lesser calcareous argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
76.5	88.3	SS Red to pinkish, grey in part, upper medium to lower coarse grained, quartzose sand, with trace dark and light chert, as well as trace-rare red-pink argillite fragments, majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, red brown argillaceous cement, paired with apparent silica cement. Porosity appear to be relatively poor due to the inhibiting silica and argillaceous cement blocking intgranular porosity. There may be some dgeree of graded bedding considering the moderate grain size difference in evaluated cuttings.		
		@ 80 m: Sandstone (100%): White to light pink, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, realitvely common clear mica, and rare red argillite grains, predominantly subangular to sub-rounded, well sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
		@ 85 m: Sandstone (100%): Light pink to white, upper fine to lower medium grained, predominantly quartzose with trace dark and argillite garins as well as micromicaceous crystals / grains, predominantly subangular to sub-rounded,		

Lithology Core Log

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Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from) cont...	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
		SS	moderately sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), fair (~ 8%) intergranular porosity, no indication of hydrocarbon stain or show.		
88.3	92.1	Cgl / SS	Reddish brown increasingly mottled grey and white, upper coarse grained, grading to predominantly conglomerate with 1-2 cm pebbles and lesser angular fragments. Quartz pebbles and lesser red + black shale fragments make up mineralogy, typically sub-rounded to sub-angular in part and moderately sorted. Conglomerate is cemented by a coarse grained sublithic sandstone, majority of sand grains are quartzose with lesser dark chert and trace mica, red argillaceous cement is common but decreasing, silica cement is also presumed considering the hardness, good consolidation, and relatively poor to fair intergranular porosity.		
			@ 90 m: Sandstone (100%): White to light pink, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, relatively common clear mica, and rare red argillite grains, predominantly subangular to sub-rounded, well sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
92.1	93.1	SS / Siltst	Grey to salt in pepper in part, lower very fine grained sandstone grading primarily to siltstone, predominantly quartzose with lesser yet common dark chert and other lithic grains, majority of grains appear to be well rounded and sorted, red-brown cm-scale laminations are observed locally as well as discrete 10-20 cm red, muddy shale beds.		
93.1	101.2	Cgl	Red - pink to increasingly spotted white and black in part (fragments), dominated by abundant (>75%), 1-8 cm (majority 2-3 cm) quartz and lesser black		

Lithology Core Log

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Surface Coordinates:	5361953 m N 386825 m E	Drill Out Date:	Jan. 7 / 2002 @ 9:00 pm	Total Depth:	605.2 m, Jan. 29/02 @ 18:00 hrs
Ground Elevation:	54.00 m	Rotary Head:	58.6 m		
Target Formation:	Ship Cove Limestone, Anguilles Sandstone / Conglomerate				
Type of Drilling Fluid:	Milgel				

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from) cont...	(to)	Cgl	and red shale pebbles surrounded by a medium to coarse grained sandstone matrix. Pebbles are poorly sorted, sub-rounded to rounded, and are typically ~ 2-3 cm in diameter. Remainder (25%) of unit is composed primarily of a coarse grained sandstone, similar to other sand in borehole. Red argillaceous cement is decreasing significantly, instead the quartzose dominated sand is cemented by lighter white clays and increasing silica. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Overall, unit is a better consolidated conglomerate with increasing cobble sized clasts, compared to above. 100-100.3 m: Rubbly, muddy core, fractures zone.	
			@ 95 m: Sandstone (100%): White to occasionally light pink, upper coarse grained, predominantly quartzose with increasing dark chert, common red brown argillite grains, predominantly subangular to sub-rounded, moderately to poorly sorted, predominantly white and red calys (argillaceous) cement (rare calcareous component), fair to possibly good (8-12%) intergranular porosity, no indication of hydrocarbon.	
			@ 100 m: Sandstone (100%): As above.	
101.2	114	SS	Pink to increasing mottled white, upper medium to lower coarse grained, quartzose sand, with trace dark and light chert, as well as minor red-pink argillite fragments, majority of grains appear to be subangular to occasionally angular, fairly well sorted, pink argillaceous cement paired with apparent silica cement. Porosity appear to be relatively poor, possibly fair due to the inhibiting silica and argillaceous cement blocking intergranular porosity. Trace (<1%) white quartz pebbles or dark shale are observed locally	

Lithology Core Log

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Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from) (to) cont...	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
	SS	as discrete clasts within sand. 104.5-106 m: Rubbly broken core, fracture zone.	
	SS / Cgl	>105 m: Sand becomes increasingly filled (up to 10%) with large subangular fragments or subrounded pebbles of white quartz, dark grey chert and black + red shale, similar to SS / Cgl described above.	
		@ 95 m: Sandstone (100%): White to light pink in aprt, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component) poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, flourescence, or show.	
		@100 m: As above.	
		@ 105 & 110 m: Sandstone (100%): White to light pink in aprt, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component) poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, flourescence, or show.	
114	133.3	Cgl / SS Red - pink to increasingly spotted white and black in part (fragments), dominated by abundant (>50%), 1-8 cm (majority 3-5 cm) quartz and lesser black and red shale pebbles surrounded by a medium to coasre grained sandstone matrix. Pebbles are poorly sorted, sub-rounded to rounded, and are typically ~ 3-5 cm in diameter. Remainder (25%) of unit is composed primarily of a coarse grained sandstone, similar to other sand in borehole. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Short intervals of muddy shale cementing	

Lithology Core Log

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Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
(from) cont...	(to)	<p>Cgl pebbles are observed especially in heavily fractured and broken zones.</p> <p>114.2-116.7 & 117.8-119.2 m: Rubbly, muddy core, containing abundant loose quartz and chert pebbles in a bright red poorly lithified mud, represents sizable fracture zone. Entire zone is mainly quartz pebble conglomerates with common interbeds of medium to coarse grained, quartzose sandstones.</p> <p>120.8-123.6, 126.3-128.3: Other rubbly broken core intervals, presumably bad fracture zones.</p> <p>@115 m: As above at 105-110 m.</p> <p>@ 120 - 130 m: Sandstone (100%): Pink to occassionally white, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component), minor silica, poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, flourescence, or show.</p>	
133.3	137.5	<p>SS Pink to increasing mottled white, upper fine to lower medium grained, quartzose sand, rare dark and light chert, as well as minor red-pink argillite fragments, majority of grains appear to be subangular to occassionally angular, fairly well sorted, pink argillaceous cement paired with apparent silica cement. Porosity appear to be relatively poor, possibly fair due to the inhibiting silica and argillaceous cement blocking intgranular porosity. Minor (<5%) white quartz pebbles or dark shale are observed locally Alternating laminations of red and grey are observed locally, hematization / oxidation factor. 10-20 cm beds of 3-5 cm pebble conglomerates are common throughout (similar to Cgl described above).</p> <p>@ 135 m: Sandstone (100%): Pink to occassionally white, upper fine to lower medium grained, predominantly loose quartzose, common red brown argillite grains (cement fragments), generally subangular to sub-rounded, well sorted,</p>	

Lithology Core Log

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Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
cont...		SS	predominantly pink argillaceous and minor silica cement (very rare calcareous component), fair (8-10%) intergranular porosity, no hydrocarbon stain, fluorescence, or show.		
137.5	166.7	Cgl / SS	Same as above @ 114 m. Regular occurrences of rubbly broken core of considerable lengths. @ 140 - 165 m: Sandstone (100%): Pink to occasionally white, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component), minor silica, poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, fluorescence, or show.		
166.7	197.5	Shale	Red to brown, fissile, platy, very poorly indurated or lithified, micromicaeous, soft poorly lithified mudstone, rubbly broken upper contact 188.9-189.5 m: Thin bed of dark grey to black muddy shale.		
197.5	201	Salt	Dark to light grey, occasionally reddish and black adjacent upper contact, crystalline, vitreous, very soft, muddy laminations in part (red & black) - interbedded shales & salt (top ~ 1.5 m).		
201	212	Shale	Red brown, fissile, poorly indurated, extremely muddy shale or mudstone containing 40-50% dirty muddy salt. > 205 m: Shale remains interbedded with abundant salt stringers, however shale is increasingly harder and siliceous, cherty in part, common calcareous component - limy shale, lithology is also becoming progressively grey vs red.		
212	217.8	Salt	Reddish brown to medium grey in part, vitreous, very soft, grading to salty shale,		

Lithology Core Log

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Type of Drilling Fluid: Milgel		

<u>Depth</u> (from) cont...	<u>(to)</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
		Salt	common brown to increasingly grey shale laminations, 80% salt, 20% shale.	
217.8	267.5	Salt	Light to dark grey, increasingly white, coarse grained, crystalline, vitreous, soft, clean salt formation. 254.5 m: 10 cm lamination of reddish brown salt containing minor muddy material, similar thin laminations observed throughout section.. > 260 m: alternating grey color changes to predominantly white, coarse grained, granular, crystalline salt.	
267.5	276	Mdst / Shale	Medium to dark grey, reddish brown in part, blocky, predominantly soft, harder and consolidated (271-273), micromicaeous, calcareous cement, grading to limey shale in part, trace discrete reddish salt fragments observed locally (adjacent upper contact).	
276	277	Sltst	Medium brown to partially grey, predominantly quartzose, grading to silty shale in part, gritty, hard, quite consolidated, slightly calcareous, silica and lesser calcareous and argillaceous cement, poor to fair intergranular porosity (6-8%), no prospective hydrocarbon fluorescence or show. Lower contact is partially brecciated by red-pink salt stringers as well as 1-2 cm, euhedral, isolated crystals of pink (potassic) salt within siltstone.	
277	279.6	Salt	Predominantly light to medium grey, mottled white and granular in part, clear to translucent, vitreous, crystalline, coarse grained, common pink to red mm-scale wispy laminations of potassium rich salt (KCl), preferentially vuggy (washed out by brine?), ie. 278.6- 279.6 m	
279.6	283	Salt	Pink to red, orange in part, common dark grey laminations (dusty argillite), occassionally mottled white, vitreous , coarse grained, crystalline, relatively hard and glassy.	

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
283	296	Salt / Mdst	<p>Interbedded pink to orange salt (as above) and dark grey, soft, shaly mudstone (as above), mudstone generally contains vitreous mm-scale stringers, and discrete euhedral ink crystals of salt (halite). Pink originally perceived as KCl may actually be a consequence of oxidation / hematization of grain surfaces.</p> <p>@ 285.4 m: 1 m zone of dark grey mud containing similar stringers and crystals of pink to red salt, as above, notably a bedding plane ~40 deg. t.c.a. is observed.</p> <p>287.8-293 m: More red-pink preferentially dissolved K-rich salt as observed above at 278.6 m, progressively vuggy and unconsolidated (nickel 'n' dime rock), partially broken and rubbly, appears to be dissolving, bitter taste and cubic crystals suggest the presence of Sylvelite or maybe carnallite?</p>		
296	298	Salt	<p>Pink to red, orange in part, common dark grey laminations (dusty argillite), occasionally mottled white, vitreous, coarse grained, crystalline, relatively hard and glassy.</p>		
298	341.3	Salt	<p>Light to dark grey, increasingly white, mottled white in part, coarse grained, crystalline, vitreous, alternating dark grey argillaceous zones with lesser white to translucent, crystalline, regularly increasing white blebs and subangular grains of gypsum (or anhydrite).</p> <p>306.6-318.4 m: Salt becomes progressively whiter and clean, practically no dark grey laminations of dusty argillaceous material, generally mottled with white gypsum or anhydrite.</p> <p>> 308.5 m: Variably sized (1-5 cm), sub-angular white fragments (3-5%) are observed throughout, presumably anhydrite?</p> <p>318.4-323.7 m: Darker grey, 'dusty' salt, as above.</p> <p>>323.7 m: As above @ 306.6 m</p> <p>328.7 m: Pink to red laminations of hematized / oxidized salt, similar in appearance to KCl salt above but lacks vuggy preferential dissolving.</p> <p>330-331.5 m: Dark grey to brown, increasingly dirty salt section.</p>		

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
341.3	343	Salt	Light brown, partially tan colored, increasingly mottled white, coarse grained, crystalline, significant increase (5-10%) in 2-3 cm, white blebs and subangular grains of gypsum, trace dark fragments also observed.		
	343	Salt	Medium to dark grey (translucent), occasionally mottled white in part, coarse grained, crystalline, glassy, "dusty" salt as described above.		
357.5	376.5	Anhydrite	Light to medium grey, bluish grey in part, massive, cryptocrystalline, hard, clean, glassy and vitreous, moderately calcareous, abrupt upper contact. End of Top Hole: Jan. 17/01 @ 4:00 am.		
			Drill Out Casing Shoe: Jan. 25/02 @ 2:30 pm.		
376.5	450	Anhydrite	Light grey to white, slightly mottled white in part, less massive, more granular appearance, coarse crystalline, remains hard and vitreous, very calcareous, possibly limy cement, no indication of hydrocarbon. Moderate variation from massive, bluish, cryptocrystalline, anhydrite to the coarse crystalline, mottled white limey anhydrite described above. > 430 m: Light brown mottled sections containing wispy, net-textured, tan hydrocarbon saturated cement. Moderate to strong hydrocarbon smell throughout, yellow spotty fluorescence, and weak yellow cut. Aside wispy textured hydrocarbon staining, stronger dark brown oil staining is observed along fracture planes. Majority of oil staining appears to be controlled by fractures, especially evident with increasing depth.	Fracture (< 1%)	X
450	476.3	Anhydrite	Light grey to white, partially bluish, massive and homogeneous, cryptocrystalline, hard and glassy (vitreous), moderately calcareous,	Fracture (1-2%)	X

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u> (from) (to) cont...	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
	Anhydrite	minor hairline fractures containing medium brown oil, 1-2% fracture porosity, minor hydrocarbon staining, yellow spotty fluorescence and yellow-white cut adjacent hairline fractures. All indications of hydrocarbons and reservoir potential appear to 100% controlled by fracture porosity. > 460 m: Increasing (10%) wispy light brown to tan, cryptocrystalline, stringers of calcite (siderite within coarse crystalline anhydrite), alternating with 20-30 cm blue laminations (beds) of hard, extremely glassy, cryptocrystalline anhydrite, weak hydrocarbons remain adjacent fractures as mentioned earlier.	Fracture	X
476.3 ~478	Shale / Ls	Thin zones of interbedded grey to buff calcareous shale (within anhydrite), grading to muddy limestone in part, mm-scale augen shaped laminae (lenses) characterize the 20-30 cm beds of calcareous material. Laminations are partially fragmented and appear to resemble algal mats with stromatolitic features possibly indicative of the upcoming Ship Cove limestone. No hydrocarbon odour or staining is observed		
478	497.5 Anhydrite	Light grey to white, bluish in part, coarse crystalline to occasionally cryptocrystalline (blue bands) hard & vitreous, slightly calcareous, no indication of hydrocarbon, as above @ < 430 m.		
497.5	498.5 Shale / Ls	Buff colored, finely laminated, calcareous shale grading to muddy limestone in part, similar to thin limy interbeds seen above @ 476.3 m, strong hydrocarbon odour is evident as well as trace spotty yellow fluorescence and poor yellow cut. Trace hairline fractures parallel the calcareous shaly laminations appear to contain oil stain, fracture controlled porosity. Bedding laminations are ~ 75-80 deg. t.c.a. suggesting stratigraphy is not perfectly flat lying.		

Lithology Core Log

Well Name: Captain Cook #1	Operator: Vulcan Minerals Inc.	Drill Contractor: Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area	License #: 96 - 105	Spud Date: Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E		Drill Out Date: Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m	Rotary Head: 58.6 m	Total Depth: 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
Type of Drilling Fluid: Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
(from)	(to)		
498.5	592	<p>Anhydrite Light grey to blue, increasing mottled white, predominantly coarse crystalline, hard & vitreous, quite homogeneous, increasingly calcareous. Rare indications of hydrocarbon, locally, moderate odour and weak brown oil staining within and adjacent too thin hairline fractures, spotty yellow fluorescence paired with a streaming yellow to white cut is typical. Fracture controlled porosity, < 1%. Very similar to anhydrite above.</p> <p>> 530 m: Increasingly mottled white presumably an increased gypsum component. Majority of anhydrite is blue, glassy cryocrystalline that contain a white, softer gypsum. No indications, odour or stain, of hydrocarbon.</p> <p>@ 584.8 m: Increasingly limy anhydrite, buff to cream colored wispy, crenulated limy / calcareous laminations of muddy limestone. Thin 20-30 cm dark grey beds of calcareous shales are also observed over a 1 m interval of transition bewteen anhydrite & limestones.</p>	
592	593.5	<p>Limestone Dark buff to cream, dary greyish in part, finely laminated / crenulated (85 deg. t.c.a.) stromatilitic limestones interbedded with lesser dark grey calcareous shales. Algae stromatolitic beds are partially breccaited and boudined locally, cryptocrystalline - microcrystalline, moderately hard, possible mouldic replacement locally, no apparent porosity or indication of hydrocarbon.</p>	
593.5	597	<p>Anhydrite Medium to aqua blue, mottled white in part, cryptocrystalline, very glassy, hard, partially calcareous, buff-cream mm-scale limestone crenulations throughout, anhydrite interbedded with algal stromatolitic limestones.</p>	

Lithology Core Log

Well Name: Captain Cook #1 **Operator:** Vulcan Minerals Inc. **Drill Contractor:** Petro Drilling Ltd. (BBS 56)
Location: Flat Bay Area **License #:** 96 - 105 **Spud Date:** Dec. 18 / 2001 @ 1:00 pm
Surface Coordinates: 5361953 m N 386825 m E **Drill Out Date:** Jan. 7 / 2002 @ 9:00 pm
Ground Elevation: 54.00 m **Rotary Head:** 58.6 m **Total Depth:** 605.2 m, Jan. 29/02 @ 18:00 hrs
Target Formation: Ship Cove Limestone, Anguilles Sandstone / Conglomerate
Type of Drilling Fluid: Milgel

<u>Depth</u> (from)		<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
597	(to)	SHIP COVE LIMESTONE			
	604	Limestone	Dark buff to cream, increasingly dark grey, very finely laminated, algal stromatolitic limestone grading to calcareous shale in part, partially fragmented and augmented brecciated laminae are relatively common throughout. > 601 m lithology becomes progressively dark grey and thus shaly - calcareous shale. No indication of hydrocarbon. @ 600 m: Dark to medium grey, buff in part, muddy argillaceous limestone grading to calcareous shale in part, well indurated, sub-fissile to blocky, partially micromicaceous, no hydrocarbon.		
		BASEMENT			
604	605.2	Granitoid / Gneiss	Dark green, mottled pink and white (K-feldspar, quartz), locally light green (epidote), melanocratic granitoid, composed primarily of dark green very fine grained hornblende (50%), surrounding megacrysts (.5 - 3 cm) of euhedral K-feldspar phenocrysts (30%), and lesser grey plagioclase (10%) and quartz (10%). Majority of the K-feldspar and plagioclase crystals have been saussureterized / altered to light green epidote. A weak irregular fabric can be observed locally ~ parallel t.c.a. , undisputably granitoid basement rock. Upper abrupt contact staggered by 3-5 cm of granite "wash".		

Total Depth: 605.2 m, Jan. 29 @ 6:30 pm.

APPENDIX IX
FINAL LEGAL SURVEY

Enos Fudge Surveys

45 WEST STREET
P.O. BOX 59
STEPHENVILLE, NF. & LAB.
A2N 2Y7
TEL. 643 4506 FAX 643 6665

Fax

To: Patrick Lantry _____ **From:** Enos Fudge _____
Fax: 709 754 3946 _____ **Date:** February 4, 2002 _____
Phone: 709 754 3186 _____ **Pages:** Two _____
Re: Co-ordinates of well & invoice _____ **CC:** [Click here and type name] _____

Urgent **For Review** **Please Comment** **Please Reply** **Please Recycle**

U.T.M. 6° (NAD 83) CO-ORDINATES FOR WELL N5362165.631 E386838.872

U.T.M. 6° (NAD 27) CO-ORDINATES FOR WELL N5361947.033 E386780.227

ELEVATION 54.2 METRES

APPENDIX X

WELL TERMINATION PROGRAM & APPROVAL

Vulcan Minerals Inc.
Captain Cook # 1
St. George's Basin, NF
Ph: (709) 673-6855/7527
Fax: (709) 647-2031

Attention: Pat Laracy

Jan. 30, 2002

**TERMINATION PROGRAM
CAPTAIN COOK #1**

Pump 150 liters of class A cement - (Portland-15.8 ppg) @ 382 m (15 m below shoe) mixed with 113 liters of water. Pull pipe to 352 m while displacing cement with 1190 liters of brine, leaving cement plug 382 m - 352 m. Pull pipe to 330 m - circulate 30 min - Wait on cement 6 hours. Run in hole to 352 m, set string weight on cement plug to ensure set up.

P.O.O.H. to 15 m, pump 45 liters of cement slurry as above. Pull out of hole - Wait on cement.

Cut casing 1 m below ground level, weld steel plate over top of casing and conductor pipe sealing hole and annulus. Well head location will be marked by a 1.5 m steel pipe welded to top of well head with a steel plate measuring 500 mm by 300 mm bead welded with well name and well location coordinates.

Regards,

Bill Williams
Well Site Superintendent



WELL DATA

Well Name: <u>Captain Cook #1</u>	Long: Lat:	Northing: <u>5361953 m N</u> Easting: <u>386825 m E</u>
Operator: <u>Vulcan Minerals Inc.</u>		
Drilling Rig: <u>BBS-56</u>	RT/KB/RF: <u>58.60</u> GL: <u>54.00</u>	TD: <u>605.2</u> TVD: <u>605.2</u>
Rig Type: <u>Boyles 56 - Slim Hole Core Rig</u>		
Drilling Contractor: <u>Petro Drilling Ltd.</u>	For the purpose of interpreting subsection 154(5) of the Petroleum Drilling Regulations, the rig release date is deemed to be: <u>Jan. 30, 2002</u>	
Spud Date: <u>Jan. 7/02</u>	Well Termination Date: <u>Jan. 30/02</u>	
TD Date: <u>Jan 29/02 @ 18:00 hrs</u>		
Rig Release Date:		

CASING AND CEMENTING PROGRAM

CEMENTING DETAILS				
88.9	34.4	-	367	Cement to Surface (Jan. 17/02)

PLUGGING PROGRAM

Approval of the following program was obtained by (person) Patrick J. Lavacy
from (person) Lies Foote of the Department of Mines & Energy by means of
telephone / facsimile dated Jan. 30/02

Type of Plug	Interval	Felt/Pressure Tested	Cement and Additives
Cement	352-352 m	Red weight (N.G. Rods) E272 kg	Class A Portland Cmt (15.8ppm) mixed w/ 113 L H ₂ O displaced by 1190 L of brine. - 145L of cement slurry
	15-Surface		

Lost Circulation/Overpressure Zones: None As Above.

Downhole Completion/Suspension Equipment: 16/H

(Describe and Attach Sketch) 16/H

DECLARATION

The undersigned operator's Representative hereby declares that on the basis of personal knowledge of operations undertaken at the above

Signed [Signature]
Operator's Representative

Name Bill Williams

Title Drilling Superintendent

Date Jan. 30/02

ACKNOWLEDGEMENT

Acknowledged by [Signature]
Director

Date Feb 8, 2002

(Revised 97-91-24)

WIRTSORF