

WELL HISTORY SUMMARY REPORT

PACIFIC ET AL PEEL YT F-37

DRILLING AUTHORITY: #547



WELL HISTORY REPORT

PACIFIC ET AL. PEEL YT F-37

PACIFIC PETROLEUMS LTD.  
P.O. BOX 6666  
CALGARY 2, ALBERTA  
T2P 6T6

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July 4/1972

PACIFIC PETROLEUMS LTD.  
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PACIFIC ET AL PEEL YT F-37

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PACIFIC PETROLEUMS LTD.

WELL HISTORY REPORT

PACIFIC ET AL PEEL YT F-37

1. SUMMARY OF WELL DATA:

- (a) Well Name: Pacific et al Peel YT F-37
- (b) Permittee: Petrofina Canada Ltd.  
Kerr-McGee of Canada N.W. Ltd.  
Canadian Superior Oil Ltd.
- (c) Operator: Pacific Petroleum Ltd.  
P.O. Box 6666  
Calgary 2, Alberta  
T2P 6T6
- (d) Location: Unit F, Section 37  
Grid: 67°-00'-134°-45'  
Lat. 66°56'26" N.; Long. 134°51'54" W.  
Unique Well Identifier: 300F376700134450.
- (e) Co-ordinates: Not Applicable.
- (f) Permit No.: 6226
- (g) Drilling Contractor: Gustavson Arctic Drilling Co.  
Rig No. 11  
Licence No. 0156
- (h) Drilling Authority: #547, issued October 20, 1971
- (i) Classification: Exploratory Wildcat
- (j) Elevations: Ground: 160' (est.)  
K.B.: 178.50'  
K.B. to Ground: 18.50'
- (k) Date Spudded: February 13, 1972
- (l) Completed Drilling: April 11, 1972
- (m) Total Depth: 11,050' k.B.  
PBTD: Surface
- (n) Status: ABANDONED
- (o) Date Drilling Rig Released: April 20, 1972
- (p) Hole Sizes to T.D.: 17 1/2" - 0 to 1115;  
8 3/4" - 1115 to 11050 T.D.

1. SUMMARY OF WELL DATA, CONT'D.(q) Casing:

Conductor ran 50' of 20" - 74# c/w 150 sax.  
 Surface casing: Ran and set 14 JTS - 13 5/8" - 54.5# c/w. Ran and set 20 JTS - 13 3/8" - 61# ST & C 8 RND. Jap casing for a total of 1101.95'. Landed at 1100' K.B. c/w 1100 sax Perma Frost cement. Clobbered returns with 950 sax, clean returns with 1100 sax. Plug down 6:30 p.m. February 20, 1972.

2. GEOLOGICAL SUMMARY:(a) Formation Tops:

	<u>Sample</u>		<u>Log</u>	
	<u>Subsea</u>	<u>Depth</u>	<u>Subsea</u>	<u>Depth</u>
Lower Cretaceous (Aptian)	- 70'	250'		
Mississippian	- 530'	710'	- 528'	708'
Upper Devonian-Imperial	- 1757'	1937'	- 1715'	1895'
Upper Devonian-Canol	- 7237'	7417'	- 7216'	7396'
Middle Devonian-Hare Indian	- 7410'	7590'		
Middle Devonian-Hume	- 7450'	7630'	- 7324'	7504'
Devonian-Silurian-Gossage	- 7770'	7900'	- 7655'	7835'
Silurian-Ordovician-Ronning	- 9554'	9734'	- 9562'	9742'
TOTAL DEPTH	-10870'	11050'	-10861'	11041'

(b) Cored Intervals:

NIL

(c) Core Descriptions:

NIL

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions:

- 0- 78 No samples.
- 78- 80 Shale: grey, blocky to occasional fissile, micromicaceous, occasional silty, trace pyrite inclusions.
- 80- 90 Sandstone: light grey, very fine to trace fine grained, subrounded to subangular, poor sorting, quartzose, siliceous, glauconitic to very glauconitic, bituminous and micropyrritic in part, argillaceous to argillaceous in part, tight; minor Shale: as above.
- 90- 110 Shale: as above; minor Sandstone: as above but not very glauconitic.
- 110- 120 Sandstone: as above; trace to occasional Shale: as above; slight trace pyrite crystal fragments.
- 120- 130 Sandstone: as above; Shale: as above; Siltstone: light to occasional medium grey, glauconitic to slightly glauconitic, argillaceous in part, micropyrritic and bituminous in part, grades in part to Sandstone: as above; trace pyrite crystal fragments.
- 130- 140 Sandstone: as above grading to Siltstone: as above; occasional Shale: as above; trace pyrite crystal fragments and angular fragments.
- 140- 150 Siltstone: as above; minor Sandstone: as above; trace pyrite, as above; very slight trace fossil fragments.
- 150- 190 Siltstone: as above, interbedded with Sandstone: as above.
- 190- 200 Shale: medium to dark grey, blocky, micromicaceous, glauconitic to very glauconitic; Sandstone: light grey, very fine to occasional fine grained, subrounded to subangular, poor to occasional fair sorting, quartzose, siliceous, glauconitic to very glauconitic in part, argillaceous to argillaceous in part, tight; minor Siltstone: light grey, sandy in part, argillaceous, slightly glauconitic; trace pyrite fragments; slight trace fossil fragments.
- 200- 250 Poor Samples but assume from cavings and geolograph interbedded Shale and Sandstone: as above with stringers Siltstone: as above, except that clastics are slightly glauconitic to glauconitic in part.

LOWER CRETACEOUS (APTIAN) 250' (- 70')

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 250- 270 Poor Samples but assume from cavings and geolograph Shale: as above with stringers of Sandstone; and minor Siltstone: as above.
- 270- 320 Shale: medium to dark grey, micromicaceous, fissile to blocky in part, slightly glauconitic, occasional micropyritic to pyritic, occasional to trace carbonaceous inclusions, trace to occasional silty, slight trace sandy; trace to occasional Sandstone: as above grading in part to Siltstone: as above.
- 320- 330 Shale: as above; minor Siltstone: as above.
- 330- 340 Shale: as above; occasional Siltstone and Sandstone: as above.
- 340- 350 Shale: as above; minor Siltstone: as above; trace Sandstone: as above.
- 350- 360 Shale: as above; occasional Siltstone: as above.
- 360- 370 Shale: as above; trace Siltstone and Sandstone: as above.
- 370- 390 Shale: as above.
- 390- 450 Shale: dark to occasional medium grey, fissile to occasional blocky, micromicaceous, slightly glauconitic in part, slightly micropyritic to very slightly pyritic, slightly carbonaceous and bituminous inclusions; occasional stringers Siltstone and Sandstone: as above; trace pyrite fragments.
- 450- 500 Shale: light to medium grey, blocky to occasional fissile, micromicaceous in part, silty to sandy in small part, occasional Sandstone: light greyish, salt and pepper, very fine to fine grained, subangular to angular, poor to fair sorting, quartzose, siliceous, argillaceous in part, glauconitic in small part, bituminous and sideritic inclusions, tight.
- NOTE: Poor samples from 500' to 710' but will assume following from cavings and geolograph.
- 500- 510 As above; slight trace conglomeratic Sandstone: fine to medium occasional coarse grained, subrounded to subangular, very poor sorting, siliceous, quartzose, slightly cherty to cherty, sideritic in part, carbonaceous in part, slightly pyritic, tight.
- 510- 530 As above with trace conglomeratic Sandstone: as above.
- 530- 550 As above with slight trace conglomeratic Sandstone: as above.
- 550- 610 As above with trace to slight trace conglomeratic Sandstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

610- 680 Shale: as above; trace to occasional Sandstone: as above.

680- 710 Shale: as above with trace to occasional conglomeratic Sandstone: as above.

MISSISSIPPIAN 710' (- 530')

710- 730 Sandstone: light grey to salt and pepper to trace buff, fine to medium grained, subangular to angular, poor sorting, quartzose, conglomeratic in part, siliceous, argillaceous to argillaceous in part, very slightly glauconitic, slightly sideritic, slightly iron stained, cherty to cherty in part, slightly carbonaceous, slightly pyritic, tight; occasional Shale: as above, very slight trace Chert fragments; slight trace pyrite fragments.

730- 750 Sandstone: light grey-white, fine to occasional very fine to medium grained, subrounded to subangular, poor to fair sorting, quartzose, siliceous, argillaceous in part, slightly silty in part, bituminous in part, very slightly glauconitic, slightly sideritic, tight; occasional Chert fragments: grey to green to grey-green to blue grey, angular to trace rounded; slight trace to trace conglomeratic Sandstone: as above.

750- 790 Poor Samples but assume as above.

790- 800 Sandstone: light greyish salt and pepper, very fine to fine grained, subangular to angular, poor sorting, quartzose, siliceous, cherty in part, argillaceous to argillaceous in part, slightly glauconitic, bituminous and sideritic, tight; interbedded with Chert: varicoloured, angular fragments, slightly pyritic; trace pyrite.

800- 810 Chert: as above; minor Sandstone: as above.

810- 830 Sandstone: as above; minor Chert: as above.

830- 860 Interbedded Chert and Sandstone: as above.

860- 940 Chert: varicoloured, coarse to very coarse, angular fragments to occasional nodules, slightly pyritic; slight trace poor vuggy porosity; trace to slight trace Sandstone: as above.

940- 960 Chert: as above; interbedded with Sandstone: as above.

960- 970 As above with Sandstone having poor to fair intergranular porosity.

970-1020 Chert: as above; minor Sandstone: as above.



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 1020-1030 Sandstone: white to light grey white, fine grained, subrounded to subangular, poor to occasional fair sorting, quartzose, siliceous, cherty to cherty in part, slightly sideritic and pyritic in part; tight to trace poor intergranular porosity; interbedded with minor Chert fragments and pebbles.
- 1030-1050 Chert: varicoloured, brecciated angular fragments, occasional nodular fragments, trace rounded pebbles, occasional iron stained, occasionally pyritic, trace to occasional bituminous, very slight trace vuggy porosity; interbedded with minor Sandstone: as above; trace pyrite fragments and partings.
- 1050-1080 Chert: as above; interbedded with Sandstone: as above with trace to occasional intergranular porosity.
- 1080-1090 Sandstone: as above, with bituminous in part and trace fair to good intergranular porosity; Chert: as above; minor Siltstone: light grey, bituminous in part, sandy grading to Sandstone: as above; occasional Shale: medium to dark grey, micromicaceous, fissile, slightly silty and bituminous and micro-pyritic; trace iron stained conglomeratic Sandstone: as above.
- 1090-1115 Shale: as above; occasional Siltstone: as above; occasional to trace Sandstone and Chert: as above.
- 1115-1150 Sandstone: white to occasional light grey white, fine to occasional very fine grained, subrounded to subangular, fair sorting, quartzose, siliceous, slightly cherty to cherty in part, argillaceous in small part, trace carbonaceous streaks, slightly bituminous and micro-pyritic, tight; interbedded with minor Shale: light to medium grey, blocky to occasional fissile, micromicaceous, silty in small part, trace carbonaceous partings and infillings, brittle; occasional Chert: as above; trace pyrite crystalline fragments.
- 1140-1150 As above but interval is more carbonaceous; trace Coal: slightly micro-pyritic to pyritic.
- 1150-1180 Interbedded Sandstone and Shale: as above; occasional Chert: as above, slight trace pyrite fragments.
- 1180-1190 Shale: light to medium grey, blocky to occasional fissile, micromicaceous, tough to occasional brittle, slightly silty; interbedded with Sandstone: light grey white, very fine to occasional fine grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, argillaceous to argillaceous in part, slightly cherty and bituminous, silty grading in part to Siltstone: light grey, argillaceous in part, tight.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 1190-1220      Shale: as above; minor Sandstone: as above.
- 1220-1380      Interbedded Sandstone and Shale: as above with Sandstone grading in small part to Siltstone; trace to slight trace Chert fragments; very slight trace pyrite pebbles and fragments.
- 1380-1390      Sandstone: as above grading in part to Siltstone: light grey, siliceous, carbonaceous in part, argillaceous in part; minor Shale: as above; occasional Chert: varicoloured, coarse to very coarse, fractured, angular to subangular, unconsolidated, sandstone matrix in part.
- 1390-1400      Chert: as above with matrix of Sandstone: light grey, white to light grey, very fine to occasional fine grained, subangular to angular, fair sorting, siliceous, quartzose, cherty in part, slightly bituminous, argillaceous to silty in part, tight; trace Shale: as above.
- 1400-1410      Chert: as above with abundant orange; occasional Sandstone: light grey white to light to medium grey to occasional brown, very fine grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, slightly bituminous, cherty in part, argillaceous in part, iron stained in part, silty in part, tight.
- 1410-1420      Sandstone: light grey to light grey white, very fine grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, silty in part, argillaceous in part, slightly bituminous, slightly cherty, tight; grades in part to Siltstone: light grey, sandy in part, argillaceous in part; interbedded with Shale: as above; occasional Chert: as above.
- 1420-1430      Shale: as above; minor Sandstone: as above; occasional Chert: as above.
- 1430-1440      Sandstone: as above; minor Shale: as above; occasional Sandstone: grey brown to brown, very fine grained, subangular, poor sorting, slightly siliceous, quartzose, silty, iron stained in part, bituminous in part, grades in part to Siltstone: tight; occasional Chert: as above.
- 1440-1490      Sandstone: light grey white to occasional white, subrounded to subangular, fair sorting, siliceous, quartzose, silty in part, slightly cherty and bituminous, tight, grades in small part to Siltstone: light grey, sandy in part, very slightly bituminous; interbedded with Shale: medium to occasional light grey, fissile to occasional blocky, micromicaceous, silty in small part, very slightly carbonaceous; occasional Chert: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 1490-1500 Interbedded Sandstone and Shale: as above; abundant Chert: as above.
- 1500-1590 Chert Conglomerate: varicoloured, coarse to very coarse to granule, subrounded to subangular to angular to trace rounded, fractured, unconsolidated, slightly iron stained, slightly micropyrritic, with a Sandstone matrix: salt and pepper to trace brown to grey, fine to medium grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, cherty, bituminous in part, very slightly iron stained and micropyrritic in part.
- 1590-1600 Chert: coarse to very coarse, as above; occasional Chert conglomerate: as above.
- 1600-1620 Chert: as above; trace Chert Conglomerate: as above.
- 1620-1660 Chert: as above with occasional Chert Conglomerate: as above.
- 1660-1680 Chert: varicoloured, coarse to very coarse, unconsolidated, subrounded to subangular to angular to trace rounded, fractured; interbedded with Sandstone: salt and pepper to light grey to grey brown, fine to medium grained, subangular to subrounded, siliceous, quartzose, cherty, argillaceous in part, bituminous in part, slightly iron stained and micropyrritic, tight; Shale: medium to dark grey, blocky to occasional fissile, micromicaceous, tough, slightly carbonaceous and bituminous in part, slightly pyritic, slightly silty.
- 1680-1780 Shale: as above.
- 1780-1790 Shale: as above; occasional Sandstone: white to occasional light grey white to slight trace brown, very fine to fine grained, subrounded to subangular, fair sorting, siliceous, quartzose, slightly cherty to cherty in part, very slightly bituminous, trace iron staining, tight.
- 1790-1810 Shale: light to medium grey, fissile to trace blocky, micromicaceous, silty in small part, brittle, very slightly carbonaceous and micropyrritic; interbedded with Sandstone: as above; occasional Chert: varicoloured, coarse to occasional very coarse, subangular to angular; occasional subrounded to trace rounded.
- 1810-1820 Interbedded Shale and Sandstone: as above with abundant Chert: as above.
- 1820-1830 Chert: as above; occasional Shale and Sandstone: as above.
- 1830-1890 Chert: as above interbedded with minor Sandstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 1890-1910      Interbedded Chert and Sandstone: as above.
- 1910-1930      As above; occasional Shale: as above.
- 1930-1937      Shale: light to medium grey, blocky to fissile, micromicaceous, carbonaceous streaks and partings in small part, slightly bituminous, slightly silty to silty in part, brittle to occasional hard Sandstone: light grey white to light grey, very fine to occasional fine grained, subrounded to subangular, fair sorting, siliceous, quartzose, cherty in part, bituminous in small part, carbonaceous partings in small part, argillaceous in part, silty in part, tight; grades to Siltstone: light grey, slightly bituminous and carbonaceous, slightly sandy to sandy in part, argillaceous in part; occasional Chert: as above.
- UPPER DEVONIAN (IMPERIAL) 1937' (-1757')
- 1937-1950      Shale: as above; Sandstone: as above; occasional Siltstone: as above; trace Chert: as above.
- 1950-1960      Shale: as above; minor Sandstone: as above; occasional Siltstone: as above; trace Chert: as above.
- 1960-1970      Shale: as above; Sandstone: as above; minor Siltstone: as above; slight trace Chert: as above.
- 1970-2010      Shale: as above; minor to occasional Sandstone: as above; slight trace Chert: as above.
- 2010-2100      Shale: medium to occasional light and dark grey, blocky to fissile, micromicaceous, tough to occasional brittle, slightly silty in part, slightly carbonaceous in small part.
- 2100-2140      Shale: as above; occasional Sandstone: light to medium grey to salt and pepper, to trace brown, very fine to fine grained, subrounded to subangular, poor sorting, siliceous, quartzose, argillaceous, silty, cherty in part, bituminous in part, tight; trace to occasional Siltstone: light grey, sandy in part, argillaceous; slight trace Chert: as above.
- 2140-2160      Shale: dark to occasional medium grey, blocky to occasional fissile, micromicaceous, tough, very slightly silty and bituminous.
- 2160-2230      Shale: medium to dark grey, blocky to fissile, micromicaceous, tough, very slightly silty and bituminous; trace to occasional Sandstone: as above.
- 2230-2250      Shale: light to medium grey, fissile, micromicaceous, tough, very slightly silty.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 2250-2260 Shale: as above; minor Sandstone: light grey white to light grey, very fine grained, subrounded to subangular, siliceous, quartzose, silty, argillaceous, slightly cherty, tight; grades in part to Siltstone: light grey, sandy, argillaceous.
- 2260-2270 Shale: as above; occasional to minor Sandstone: as above.
- 2270-2290 Shale: as above; occasional Sandstone: light grey white to light grey to trace brown, very fine to fine grained, subrounded to subangular, poor sorting, siliceous, quartzose, argillaceous and silty in part, cherty, trace iron stained, tight; trace Chert fragments: as above.
- 2290-2350 Shale: as above; occasional Sandstone: as above; slight trace Chert: as above.
- 2350-2370 Shale: medium to dark grey, fissile to occasional blocky, micromicaceous, tough, bituminous in small part, very slight carbonaceous streaks, very slightly silty to sandy; occasional Sandstone: as above; trace Chert fragments: as above.
- 2370-2390 Shale: medium to occasional light to dark grey, fissile to occasional blocky, micromicaceous, tough, very slightly silty; trace Sandstone: as above.
- 2390-2400 Shale: as above; minor Sandstone: as above.
- 2400-2440 Shale: as above; occasional Sandstone: as above; slight trace Chert fragments.
- 2440-2450 Shale: light to medium grey, fissile to occasional blocky, micromicaceous, brittle to occasional tough; minor Sandstone: light grey white to occasional light grey, very fine to occasional fine to trace medium grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, silty in part, slightly cherty in part, slightly carbonaceous and bituminous in part, iron stained in small part, tight; slight trace angular white Chert fragments.
- 2450-2500 Interbedded Shale and Sandstone: as above; slight trace to trace Chert: as above.
- 2500-2520 Shale: as above; occasional Sandstone: as above; slight trace Chert: as above.
- 2520-2580 Shale: light to occasional medium grey, blocky to fissile, micromicaceous, brittle to occasional tough.
- 2580-2620 Shale: light to medium to trace dark grey, blocky to fissile, micromicaceous, slightly bituminous in part, slightly silty in part; trace very fine grained Sandstone: as above; grading in

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- part to Siltstone: light grey, sandy in part, argillaceous in part.
- 2620-2670 Interbedded Shale: as above with Sandstone: as above with argillaceous in part; minor to occasional Chert: white to grey white to trace varicoloured, very coarse to occasional coarse, subrounded to subangular to angular fragments.
- 2670-2740 Sandstone: as above; minor Shale: as above; occasional Chert: as above.
- 2740-2750 Sandstone: light grey, very fine to trace fine and medium grained, subrounded to subangular, fair sorting, siliceous, quartzose, silty to silty in part, argillaceous in part, slightly cherty in small part, very slightly bituminous, tight, grades in part to Siltstone: light grey, argillaceous, sandy in part; occasional Shale: as above; slight trace Chert fragments.
- 2750-2760 Sandstone: light grey white to occasional light grey, very fine to occasional fine to trace medium grained, subrounded to subangular, fair sorting, siliceous, quartzose, silty in part, argillaceous in small part, slightly cherty, very slightly bituminous, tight; occasional Shale: as above; occasional Chert: as above.
- 2760-2770 Sandstone: as above; minor Shale: as above; trace Sandstone: brown, very fine grained, subrounded to subangular, fair sorting, siliceous, silty, bituminous, tight, grades in part to Siltstone: slight trace Chert: as above.
- 2770-2780 Sandstone: white to light grey white, fine to occasional medium grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, cherty to cherty in part, tight; minor Shale: as above; minor Siltstone: light grey, argillaceous; occasional Chert fragments: as above.
- 2780-2790 Sandstone: as above; minor Shale: as above; occasional Siltstone: as above; occasional Chert: as above.
- 2790-2800 Sandstone: as above; minor Shale: as above; occasional Chert: as above.
- 2800-2810 Sandstone: as above; occasional Shale: as above; occasional Chert: as above.
- 2810-2860 Chert: as above; interbedded with occasional Sandstone: as above.
- 2860-2890 Chert: as above; interbedded with minor Sandstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 2890-2900 Shale: medium to dark grey, blocky to occasional fissile, micromicaceous, slightly silty in small part, brittle to tough in small part; occasional interbedded Chert and Sandstone: as above.
- 2900-2910 Shale: as above.
- 2910-2920 Sandstone: as above; minor Chert: as above.
- 2920-2930 Sandstone: as above; occasional Chert: as above.
- 2930-2950 Shale: as above; trace Sandstone: as above; trace Chert: as above.
- 2950-3080 Shal as above; trace Siltstone: grey, argillaceous, arenaceous in part.
- 3080-3120 Shale: as above; Sandstone: light grey white to occasional white, very fine to fine to trace medium grained, subrounded to subangular, fair sorting, siliceous, quartzose, cherty in part, very slightly bituminous, tight; trace Chert: as above; trace Siltstone: grey to light grey, argillaceous, arenaceous in part.
- 3120-3130 Sandstone: as above; Shale: as above; occasional Chert: as above.
- 3130-3140 As above with trace Sandstone: brown, very fine grained, subangular, fair sorting, siliceous, bituminous, tight to trace poor intergranular porosity.
- 3140-3160 Sandstone: as above; occasional Chert: as above; trace brown Sandstone: as above; trace Siltstone: as above.
- 3160-3180 Sandstone: as above; occasional Chert: as above.
- 3180-3190 Sandstone: as above; Shale: as above; trace Siltstone: as above; trace Chert: as above.
- 3190-3250 Shale: light to medium grey, fissile to occasional blocky, micromicaceous, brittle, silty in small part; interbedded with Sandstone: light grey to light grey white, very fine to occasional fine grained, subrounded to subangular, fair sorting, quartzose, siliceous, argillaceous in part, silty in part, slightly cherty, very slightly bituminous, tight, grading in part to Siltstone: light to medium grey, argillaceous, silty in part; trace Chert: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 3250-3270 Shale: as above; minor Sandstone: as above grading in part to Siltstone: as above; slight trace Chert: as above.
- 3270-3300 Shale: medium to dark to occasional light grey, fissile to blocky, micromicaceous brittle to tough, very slightly silty, very slightly bituminous.
- 3300-3310 As above; trace pyrite fragments.
- 3310-3330 Shale: medium to dark grey, fissile to blocky, micromicaceous, tough to brittle.
- 3330-3500 Shale: medium to occasional light to trace dark grey, blocky to occasional fissile, tough to trace brittle.
- 3500-3520 Shale: as above; occasional Sandstone: light grey to occasional light grey white, very fine to trace fine grained, subrounded to subangular, fair sorting, siliceous, silty, argillaceous in part, tight, grading in part to Siltstone: light to medium grey argillaceous, arenaceous in part.
- 3520-3540 Shale: as above; trace Sandstone: as above.
- 3540-3560 Shale: medium to dark to occasional light grey, fissile to occasional blocky, micromicaceous, brittle to tough, slightly bituminous, silty in small part.
- 3560-3590 Shale: as above; occasional Sandstone: as above.
- 3590-3600 Shale: as above; minor Sandstone: medium to occasional light greyish salt and pepper, very fine to occasional fine grained, subrounded to subangular, poor to fair sorting, siliceous, quartzose, slightly cherty in part, carbonaceous, slight trace micro-pyritic, tight; grading in small part to Siltstone: medium grey arenaceous, argillaceous in part.
- 3600-3620 Shale: medium to dark grey, fissile to blocky, micromicaceous, tough to brittle, silty in small part; occasional Sandstone: as above.
- 3620-3630 Shale: as above; trace Sandstone: as above.
- 3630-3650 Shale: medium to occasional light to trace dark grey, fissile to occasional blocky, tough to trace brittle, micromicaceous, silty in small part.
- 3650-3680 Shale: medium to occasional dark to trace light grey, blocky to occasional fissile, tough, micromicaceous; trace Sandstone and Siltstone: as above.



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 3680-3750 Shale: light to medium to dark grey, fissile to blocky, micromicaceous, tough to brittle, trace Sandstone: as above.
- 3750-3760 Shale: light to medium grey, fissile to blocky, micromicaceous, tough to occasional brittle; occasional Siltstone: light to medium grey, arenaceous, argillaceous in part; grading in part to Sandstone: light grey to light greyish salt and pepper, very fine grained, subrounded to subangular, poor to fair sorting, siliceous, argillaceous in part, silty in part, slightly bituminous and cherty, tight.
- 3760-3780 Shale: medium to dark grey, fissile to blocky, micromicaceous, tough to brittle; occasional Siltstone and Sandstone: as above.
- 3780-3800 Shale: medium to dark to occasional light grey, fissile to blocky, micromicaceous, tough; trace Sandstone: as above.
- 3800-3900 Shale: as above; trace Siltstone: as above; grading to Sandstone: as above.
- 3900-3990 Shale: as above; trace to occasional Siltstone: as above; grading to Sandstone: as above.
- 3990-4050 Shale: as above but dark to medium; minor stringers of Sandstone: as above grading to Siltstone: as above.
- 4050-4080 Shale: as above; trace Sandstone: as above; trace Siltstone: as above.
- 4080-4090 Shale: as above; occasional Sandstone: as above grading to Siltstone: as above.
- 4090-4110 Shale: as above; trace Sandstone and Siltstone: as above.
- 4110-4190 Shale: medium to light to occasional dark grey, blocky to occasional fissile, micromicaceous, tough to occasional brittle, silty in small part; trace Siltstone: as above grading to Sandstone: as above.
- 4190-4310 Shale: medium to occasional light to trace dark grey, blocky to fissile, micromicaceous, tough, slightly silty in part; trace Siltstone: as above; grading to Sandstone: as above.
- 4310-4320 Shale: as above; occasional Sandstone: as above.
- 4320-4390 Shale: as above interbedded with Sandstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 4390-4410 Shale: as above; occasional Sandstone: as above.
- 4410-4420 Shale: as above; minor Sandstone: as above.
- 4420-4450 Shale: as above; occasional Sandstone: as above grading to Siltstone: as above.
- 4450-4460 Shale: as above; minor Sandstone: as above.
- 4460-4500 Shale: as above; occasional Sandstone: as above; grading to Siltstone: as above.
- 4500-4510 Shale: light to medium to occasional dark grey, fissile to blocky, tough, micromicaceous, silty in small part; minor Sandstone: as above; grading in part to Siltstone: as above; trace Siltstone: grey brown, very argillaceous; slight trace pyrite fragments.
- 4510-4520 Shale: as above grading to Siltstone: as above; trace Sandstone: as above.
- 4520-4530 Shale: light to medium grey, fissile to blocky, micromicaceous, tough, very silty in part; grading to Siltstone: light grey to light brown, very argillaceous; trace Sandstone: as above.
- 4530-4540 Sandstone: grey salt and pepper, very fine to fine grained, subangular to subrounded, well sorted, argillaceous in part, appears tight; trace Sandstone: as above.
- 4540-4550 Shale: light to medium grey, fissile to blocky, micromicaceous, silty in part, trace Siltstone and Sandstone: as above.
- 4550-4560 Shale: as above, light grey, very silty in part grading to Siltstone: light grey to light brown, very argillaceous; trace Sandstone: as above; trace pyrite.
- 4560-4580 Siltstone: as above grading to Sandstone: as above; trace Shale: as above.
- 4580-4590 Shale: light to medium grey, fissile to blocky, micromicaceous, hard, trace Siltstone: and very fine grained Sandstone: as above.
- 4590-4600 Shale: as above becoming very silty and grading to Siltstone: light grey to medium grey brown, very fine to fine grained, subangular to subrounded, well sorted, very silty, appears tight.
- 4600-4610 Sandstone: as above; with Siltstone and Shale: as above.

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

- 4610-4620 Sandstone: medium to dark grey, rest as above; Siltstone: as above; trace Shale: medium grey, fissile to blocky, micromicaceous, hard; trace pyrite.
- 4620-4630 Siltstone: medium grey to brown, very argillaceous; grading in small part to very fine to fine grained Sandstone: as above. Also trace Shale: as above.
- 4630-4640 Sandstone: medium grey to brown, very fine to occasionally fine grained, subangular to subrounded, well sorted, very argillaceous, appears tight; trace Sandstone: as above, fine to medium grained, cherty (cavings ??); trace Shale and Siltstone: as above.
- 4640-4650 Sandstone: light to medium brown, very argillaceous, rest as above; grading in part to Siltstone: light to medium brown as above.
- 4650-4670 Siltstone: as above grading to Shale: light to medium grey, micromicaceous, blocky to fissile, hard; trace Sandstone: as above.
- 4670-4700 Siltstone: light to medium grey; grading to Shale: light to medium grey as above; trace Sandstone: as above, increasing with depth.
- 4700-4720 Sandstone: light to medium brown, very fine to fine to occasionally medium grained, subangular to subrounded, well sorted, very argillaceous, appears tight. Siltstone: light to medium brownish grey, as above; trace Shale: as above.
- 4720-4730 Shale: light to medium grey, micromicaceous, very silty; grading to Siltstone: as above.
- 4730-4740 Siltstone: as above, grading in part to Sandstone: light grey to brown, salt and pepper, very fine to fine grained, subangular to subrounded, well sorted, very silty, argillaceous, tight.
- 4740-4750 Shale: as above with trace Siltstone: as above.
- 4750-4760 All as above with trace sandstone: as above.
- 4760-4780 Sandstone: light grey, very fine to fine grained, rest as above, trace Siltstone: as above.
- 4780-4790 Siltstone: as above with trace Shale and Sandstone: as above.
- 4790-4800 Sandstone: light grey brown, very fine to fine grained, rest as above, appears tight; trace Siltstone: as above; trace Shale: as above.

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

- 4800-4810 Sandstone: medium grey, very fine to fine grained, rest as above, appears tight; trace Siltstone and Shale: as above.
- 4810-4820 Sandstone: medium brown to grey, fine grained, subangular to subrounded, well sorted, very argillaceous, tight; Siltstone and Shale: as above.
- 4820-4840 Shale: light to medium grey, micromicaceous, fissile to blocky, hard; trace Siltstone: as above; trace Sandstone: as above.
- 4840-4850 Sandstone: light to medium brown, very fine to fine grained, subangular to subrounded, well sorted, very argillaceous, tight; grading to Siltstone and Shale: as above.
- 4850-4867 Siltstone: light grey brown; grading to Sandstone: light grey to brown, very fine to fine grained, subangular to subrounded, well sorted, very argillaceous, silty, tight; trace Shale: light grey brown, very silty in part.
- 4860-4870 Sandstone: light grey brown, fine grained, quartzitic, occasionally cherty, rest as above; minor Siltstone: as above.
- 4870-4890 Siltstone: light brownish grey; grading to Shale: very silty, as above; Sandstone stringers: as above.
- 4890-4910 Sandstone: very fine to fine grained, rest as above; Shale and Siltstone stringers: as above.
- 4910-4920 Siltstone: light grey to light brown; grading to Sandstone: very fine to fine grained, rest as above; trace Shale: light to medium grey, as above.
- 4920-4940 Sandstone: light to medium grey, very fine to fine grained, subangular to subrounded, well sorted, appears very silty, appears tight; grading to Siltstone: as above; trace Shale: also as above.
- 4940-4950 Shale: light to medium grey, blocky to fissile, micromicaceous, very silty; grading to Siltstone: as above; trace Sandstone: as above.
- 4950-4970 Siltstone: as above; grading to Sandstone: also as above, very silty, very fine to fine grained, tight; Shale stringers: as above.
- 4970-4990 Sandstone: as above, very soft and friable, very silty, rest as above; also Shale and Siltstone stringers: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 4990-5020 Sandstone: light brownish grey, very fine to fine grained, subangular to subrounded, well sorted, argillaceous, very silty, tight; grading to Siltstone and Shale: as above.
- 5020-5040 Siltstone: light grey to brown, as above; grading to very silty Shale: as above; and very fine grained, silty Sandstone: also as above.
- 5040-5060 Shale: light to medium grey, very silty, micromicaceous, blocky to fissile; grading to Siltstone: as above; trace Sandstone: as above.
- 5060-5070 Siltstone: light to medium grey, as above; grading to Sandstone: light to medium grey, very fine to fine grained, subangular to subrounded, well sorted, very silty, tight; trace Shale: as above.
- 5070-5090 Shale: as above; grading to Siltstone: as above; trace Sandstone: very fine to fine grained, as above.
- 5090-5100 Sandstone: as above, very silty; grading to Siltstone and Shale: as above.
- 5100-5130 Siltstone: light brownish grey; grading to Shale: light grey, silty, blocky to fissile; trace very fine grained, very silty Sandstone: as above.
- 5130-5140 Siltstone: as above; grading to Sandstone: light grey, very fine to fine grained, subangular to subrounded, very silty, friable in part, tight; minor Shale: as above.
- 5140-5180 Shale: light to medium grey, micromicaceous, very silty, blocky to fissile; grading to Siltstone: as above and Sandstone stringers: as above, throughout.
- 5180-5220 Siltstone: light grey, as above; grading to Sandstone and Shale: as above.
- 5220-5230 Shale: light to medium grey, micromicaceous, very silty; grading to Siltstone: light grey as above and occasionally very fine grained Sandstone: also as above.
- 5230-5240 Sandstone: light grey to brown, very fine to fine grained, subangular to subrounded, well sorted, very silty, tight; grading to Siltstone: as above and Shale: as above.
- 5240-5250 Sandstone: light to medium grey brown, fine to occasionally medium brown, rest as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 5250-5270 Shale: light to medium grey, micromicaceous, blocky to fissile, very silty; grading to Siltstone: as above.
- 5270-5280 Shale: as above with numerous Siltstone and Sandstone stringers: as above, throughout.
- 5280-5290 Siltstone: light to medium grey; grading to Shale and Sandstone: as above.
- 5290-5310 Sandstone: light grey to brown, salt and pepper, fine grained, subangular to subrounded, well sorted, very silty, appears tight; Shale and Siltstone: as above.
- 5310-5320 Shale: light to medium grey, blocky to fissile, micromicaceous, silty; grading in part to Siltstone: as above.
- 5320-5330 Shale: as above with increasing Siltstone: also as above; trace Sandstone: as above.
- 5330-5340 Sandstone: light grey, salt and pepper, very fine to fine grained, subangular to subrounded, well sorted, very silty, appears tight; trace Siltstone and Shale: as above.
- 5340-5350 Shale: as above; with Sandstone and Siltstone stringers: as above.
- 5350-5370 Sandstone: as above, very silty in part; grading to Siltstone: as above.
- 5370-5380 Sandstone: as above, fine to occasionally medium grained, appears tight, as above.
- 5380-5390 Sandstone: salt and pepper, very fine to fine grained, subangular to subrounded, well sorted, very silty, appears tight.
- 5390-5420 Sandstone: as above; with Shale stringers: as above, throughout.
- 5420-5430 Siltstone: light grey, as above; grading to Shale: and very fine grained Sandstone: also as above.
- 5430-5440 Sandstone: light grey brown, very fine to fine grained, subangular to subrounded, well sorted, very silty, appears tight; grading to Siltstone: light grey; trace Shale: light grey, micromicaceous, very silty, as above.
- 5440-5450 Siltstone: as above; grading to Shale: as above.
- 5450-5470 Shale: light to medium grey, micromicaceous, very silty; grading to Siltstone: as above; with occasional Sandstone stringers: as above throughout.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 5470-5500 Shale and Siltstone: as above; trace Sandstone: also as above.
- 5500-5520 Sandstone: light brownish grey, very fine to fine grained, subangular to subrounded, well sorted, very silty, appears tight; trace Siltstone and Shale: as above.
- 5520-5530 Siltstone: light grey, as above; grading to Shale: as above.
- 5530-5540 Shale: light grey, very silty; grading to Siltstone: as above; trace Sandstone stringers: as above.
- 5540-5560 Sandstone: light grey, salt and pepper, very fine to fine, subangular to subrounded, very silty, well sorted, very argillaceous, appears tight; grading to Siltstone: as above.
- 5560-5570 Sandstone: as above; with increasing Siltstone:
- 5570-5580 Siltstone: as above; grading to Sandstone and Shale: as above.
- 5580-5600 Sandstone: light grey, very fine to fine, salt and pepper, well sorted, very silty, tight; minor Siltstone: as above; trace Shale: as above.
- 5600-5610 Siltstone and Shale: as above; slight trace Sandstone: as above.
- 5610-5670 Sandstone: light brownish grey, very fine to fine, subangular to subrounded, very silty, tight; trace Siltstone stringers: throughout.
- 5670-5680 Siltstone: light grey; grading to Shale: as above.
- 5680-5690 Sandstone: light grey, very fine to fine, very silty, as above, tight; minor Siltstone: grading to Shale: as above.
- 5690-5700 Shale: light grey, micromicaceous, very silty; grading to Siltstone: as above; trace Sandstone: as above.
- 5700-5720 Siltstone: light grey, as above; grading to Sandstone: as above.
- 5720-5740 Shale: light grey, micromicaceous, very silty; grading to Siltstone: as above; trace Sandstone: as above.
- 5740-5780 Poor Samples due to trip - Shale and Siltstone: as above.
- 5780-5800 Siltstone: light grey, as above; grading to Sandstone: light grey, salt and pepper, very fine to fine grained, very silty.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- tight; grading to Shale: light to medium grey, micromicaceous.
- 5800-5810 Shale: as above; grading to Siltstone: as above; trace Sandstone: as above, tight.
- 5810-5820 Siltstone: light grey; grading to Sandstone: light grey, very fine to fine, silty, as above.
- 5820-5860 Siltstone: as above; grading to Sandstone: very fine to fine, tight, as above; with Shale stringers: throughout, as above.
- 5860-5880 Sandstone: light grey, very fine to fine grained, subangular to subrounded, well sorted, very silty, tight; grading to Siltstone: as above.
- 5880-5890 Siltstone: as above; with Sandstone stringers: as above, throughout; trace Shale: as above.
- 5890-5900 Siltstone: light to medium grey, rest as above.
- 5900-5910 Sandstone: light to medium grey, very fine to fine grained, subangular to subrounded, well sorted, very silty; grading to Siltstone: as above.
- 5910-5940 Sandstone: as above; with occasional Shale stringers: throughout.
- 5940-5960 Siltstone: light to medium grey, as above; grading to Shale: as above; trace Sandstone.
- 5960-5970 Shale: light to medium grey, micromicaceous, as above; minor Siltstone: as above.
- 5970-6010 Siltstone: light to medium grey, as above; grading to Sandstone: as above in part; minor Shale: as above.
- 6010-6030 Siltstone: as above; with Sandstone: as above; with Shale stringers: throughout.
- 6030-6040 Shale: light to medium grey, micromicaceous, very silty; grading in large part to Siltstone: as above; also trace Sandstone: as above.
- 6040-6080 Siltstone: light to medium grey brown; grading to Sandstone: light to medium grey brown, very fine to fine grained, very silty, appears tight, numerous Shale stringers: throughout, as above.
- 6080-6090 Siltstone: medium grey brown, as above; with Shale: medium grey, very silty, as above.



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 6090-6100 Shale and Siltstone: as above; with Sandstone: light to medium grey, very fine grained, tight, as above.
- 6100-6110 All as above; with increased Shale: as above.
- 6110-6130 Siltstone: light grey brown; grading to Sandstone: light grey, very fine to fine grained, as above; minor Shale: throughout.
- 6130-6140 All as above; with increased Shale: as above.
- 6140-6150 Siltstone: light to medium brownish grey; grading to Sandstone: light to medium grey, as above; minor Shale: as above.
- 6150-6170 Poor Samples - sample box screwed - appears same as above.
- 6170-6200 Siltstone: as above; grading to Sandstone: in part; Shale stringers: as above.
- 6200-6220 Shale: light grey, micromicaceous, very silty; grading to Siltstone: light grey to brown, as above; also Sandstone: light grey, very fine to fine grained, very silty, appears tight, as above.
- 6220-6230 Siltstone: as above; grading to Sandstone: as above; minor Shale: as above.
- 6230-6250 All as above, with numerous Shale stringers: as above throughout.
- 6250-6270 Intermittent Shale and Siltstone stringers: as above.
- 6270-6280 Siltstone: medium brown to grey; grading to Shale: medium grey, micromicaceous, very silty, as above; trace Sandstone: medium brown to grey, very fine to fine grained, very silty, appears tight, as above.
- 6280-6300 Siltstone: light to medium grey; grading to Sandstone: light to medium grey, as above; trace Shale: as above.
- 6300-6330 All as above with Shale stringers: throughout.
- 6330-6340 Siltstone: as above; grading to Sandstone: as above, in part; minor Shale: as above.
- 6340-6380 Siltstone: light to medium grey brown, as above; trace Shale: light to medium grey, very silty, as above; trace Sandstone: very fine to fine grained, very silty, as above.
- 6380-6400 Siltstone: as above; with Sandstone and Shale stringers: as above, throughout.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 6400-6410 Sandstone: light grey brown, very fine to fine grained, very silty, appears tight; minor Siltstone: light grey, as above; trace Shale: as above.
- 6410-6420 Siltstone: light grey brown, as above; trace Sandstone: as above; minor Shale: light to medium grey, micromicaceous, silty.
- 6420-6430 Siltstone: as above; grading in large part to Sandstone: very fine to fine grained, as above; minor Shale: as above.
- 6430-6490 Shale: light to medium grey, micromicaceous, very silty; grading to Siltstone in part, light to medium grey brown; trace Sandstone stringers: as above.
- 6490-6510 Siltstone: light grey brown; grading to Sandstone: as above in part; appears tight; minor Shale: as above.
- 6510-6520 Shale: dark grey to occasional dark brownish grey to trace medium grey, subfissile to blocky, micromicaceous, tough, slightly bituminous, silty in small part; minor Sandstone: greyish salt and pepper to brownish grey, very fine grained, subrounded to subangular, fair sorting, siliceous, argillaceous in part, silty to very silty in part, very slightly cherty and carbonaceous, tight.
- 6520-6550 Interbedded Shale and Sandstone: as above.
- 6550-6560 Shale: as above; minor Sandstone: as above.
- 6560-6620 Shale: as above; occasional Sandstone: as above.
- 6620-6660 As above; with trace Siltstone: light to medium grey, argillaceous, slightly sandy.
- 6660-6700 Shale: as above; minor Sandstone: as above.
- 6700-6720 Shale: as above; occasional to trace Sandstone: as above.
- 6720-6740 Shale: as above; occasional to minor Sandstone: light to occasional medium greyish salt and pepper, very fine grained, subrounded to subangular, fair sorting, siliceous in part, silty, argillaceous in part, tight, grading in part to Siltstone: light to medium grey, argillaceous in part, arenaceous to arenaceous in part.
- 6740-6800 Interbedded Shale and Sandstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

- 6800-6850 Shale: dark to medium grey to occasional dark brownish grey, blocky to subfissile, micromicaceous, tough to brittle in small part, slightly bituminous in part, silty in small part, interbedded with medium to occasional light grey, argillaceous, arenaceous to arenaceous in part; occasional Sandstone: as above.
- 6850-6860 Shale: as above; occasional Siltstone: as above.
- 6860-6870 Shale: as above; minor Siltstone: as above grading in part to Sandstone: medium grey, very fine grained, subrounded to sub-angular, fair sorting, silty, argillaceous in part, slightly siliceous, slightly carbonaceous in part, tight.
- 6870-6980 Shale: as above; occasional to minor Siltstone: as above.
- 6980-7110 Shale: as above interbedded with Siltstone: light to occasional medium grey, argillaceous in part, arenaceous, grading in small part to Sandstone: as above.
- 7110-7120 Siltstone: as above; minor Shale: as above.
- 7120-7140 Shale: as above; Siltstone: as above.
- 7140-7150 Shale: as above; Siltstone: as above grading in part to Sandstone: as above.
- 7150-7160 Shale: as above; minor Siltstone: as above.
- 7160-7200 Shale: dark to medium grey to dark brown to dark brown grey, subfissile to occasional blocky, micromicaceous, tough, silty in small part.
- 7200-7330 Shale: as above; occasional Siltstone: medium to occasional light grey, slightly arenaceous, argillaceous, very slightly calcareous, grading in small part to Sandstone: medium to occasional light grey, very fine grained, subrounded to sub-angular, fair sorting, slightly carbonaceous, tight.
- 7330-7360 Shale: as above; trace Siltstone: as above.
- 7360-7380 Shale: as above; occasional Siltstone: as above.
- 7380-7417 Shale: dark grey to dark grey brown to occasional dark brown to occasional medium to occasional light grey, subfissile to blocky, micromicaceous, tough, silty in small part; minor Siltstone: dark brown to dark grey brown, argillaceous, slightly bituminous; grading to Shale: dark brown to dark grey brown, blocky, micromicaceous, tough, silty; trace Siltstone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

CANOL 7417 (-7237)

- 7417-7430 Shale: black to dark brown black to dark brown, blocky to occasional subfissile, slightly micromicaceous, very tough, siliceous, slightly cherty in small part, trace to occasional micropyrritic to pyritic.
- 7430-7460 As above with trace bitumen to slight trace pyrobitumen partings.
- 7460-7480 Shale: medium to dark grey to dark grey brown to black to black brown, subfissile to blocky, micromicaceous to micromicaceous in part, tough, siliceous in part, silty in small part; occasional Siltstone: medium to occasional light grey to trace brown grey, argillaceous in part, arenaceous in part, slight trace pyrite fragments.
- 7480-7510 Shale: black to dark brown black to occasional dark brown, subfissile to blocky, slightly micromicaceous, bituminous, tough, siliceous, very slight trace calcite veins, slightly micropyrritic to pyritic in part, trace bitumen to pyrobitumen partings.
- 7510-7520 Shale: as above; trace pyrite fragments.
- 7520-7530 Shale: black to dark brown black to occasional dark brown to occasional dark grey to dark grey black, subfissile to blocky, slightly micromicaceous to micaceous in part, bituminous to bituminous in part, siliceous to siliceous in part, occasional micropyrritic to pyritic in part; trace pyrite fragment; trace bitumen to pyrobitumen partings.
- 7530-7540 Shale: black to dark brown black to occasional dark brown to occasional dark grey black, subfissile to blocky, slightly micromicaceous, bituminous, siliceous, occasional micropyrritic to pyritic; occasional pyrite fragments; slight trace chert fragments: black, angular.
- 7540-7550 As above with trace chert: as above and slight trace fossil imprints.
- 7550-7560 Shale: black to dark brown black to occasional dark brown to trace dark grey black, subfissile to blocky, slightly micromicaceous, bituminous, siliceous, tough, trace micropyrritic to pyritic, slightly cherty in part; slight trace chert: as above; trace Limestone: dark brown buff to occasional light brown, cryptocrystalline to trace microcrystalline, argillaceous in part, slightly bituminous in part, slightly silty to arenaceous in part, dense; trace pyrite fragments.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

7560-7590 As above but trace Chert: as above.

HARE INDIAN 7590 (-7410)

7590-7610 Limestone: buff to occasional dark brown buff to occasional grey brown, cryptocrystalline to trace microcrystalline, argillaceous in part, bituminous in small part, slight trace calcite crystal infilling, slight trace fossiliferous, dense; minor Limestone: light brown to light brown cream, microcrystalline to occasional cryptocrystalline, chalky in part, slightly argillaceous in part, slight trace fossil imprints, very slight trace calcite crystal infilling, dense; interbedded with Shales: black to dark grey to trace dark brown grey, blocky to subfissile, micromicaceous in part, siliceous to siliceous in part, bituminous to bituminous in part, slightly calcareous in part, very slight trace calcite crystal clusters.

7610-7630 Limestone. buff to occasional dark brown buff to occasional grey brown, cryptocrystalline to microcrystalline, argillaceous in part, bituminous in very small part, trace calcite crystal infilling, trace fossiliferous, dense; minor Limestone: light brown to light brown cream, microcrystalline to occasional cryptocrystalline, chalky in part, slightly argillaceous in part, trace fossil imprints, slight trace calcite crystal infilling, dense; interbedded with Shale: black to dark grey to trace dark brown grey, blocky to subfissile, micromicaceous in part, siliceous to siliceous in part, bituminous to bituminous in part, slightly calcareous in part; trace calcite crystal clusters; trace pyrite fragments.

HUME 7630 (-7450)

7630-7660 Limestone: grey brown to buff brown, cryptocrystalline to trace microcrystalline, argillaceous to argillaceous in part, slight trace calcite crystal infilling, trace fossiliferous, dense; occasional Limestone: cream brown to tan to occasional light grey brown to occasional light grey, microcrystalline to trace very fine crystalline to trace cryptocrystalline, slightly chalky, bioclastic in part, trace organic (algae?), trace fossiliferous such as brachiopods, erinoids, and ostracods, very slightly oolitic, trace calcite crystal infilling, dense; slight trace calcite crystal clusters.

7660-7670 Darker Limestone: as above only occasional microcrystalline; minor lighter Limestone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 7670-7700 Limestone: grey brown to buff brown, cryptocrystalline to microcrystalline, argillaceous in part, occasional calcite crystal infilling, slightly bioclastic, fossiliferous with ostracods and stromatoporoids, dense; Limestone: cream brown to tan to light brown grey, microcrystalline to trace very fine crystalline, slightly chalky in part, bioclastic in part, organic (algae?) in part, trace fossiliferous, with ostracods, crinoids, and brachiopods, dense, slight trace calcite crystal clusters.
- 7700-7720 Limestone: grey brown to buff brown, cryptocrystalline to microcrystalline, argillaceous in part, occasional calcite crystal infilling, slightly bioclastic, fossiliferous with ostracods and possibly stromatoporoids, dense; minor Limestone: light to medium brown to grey brown to occasional mottled cream, microcrystalline, organic (algae?) in part, trace fossil imprints, trace ostracods, dense, occasional Limestone: cream brown to tan to cream, microcrystalline to trace very fine crystalline, slightly chalky in part, bioclastic in part, trace fossiliferous, dense.
- 7720-7750 Interbedded Limestones: as above with minor cream brown to tan to cream Limestone: as above.
- 7750-7770 Limestone: dark brown to dark brown buff to brown buff to occasional medium brown grey, cryptocrystalline to occasional microcrystalline, argillaceous to argillaceous in part, trace calcite crystal infilling, slightly bioclastic in part, slightly fossiliferous with stromatoporoids and corals. Limestone: medium to occasional light brown, microcrystalline to trace very fine crystalline, organic (algae?), trace fossil imprints, fossiliferous with ostracods, slightly argillaceous, dense, trace light brown cream to cream to tan Limestone: as above.
- 7770-7780 Limestone: dark brown to dark brown buff to occasional brown buff, cryptocrystalline to microcrystalline, argillaceous, slightly fossiliferous, trace calcite crystal infilling; minor Limestone: medium brown, microcrystalline to trace very fine crystalline, organic (algae?), argillaceous, slightly fossiliferous, dense; trace light brown cream to cream Limestone: as above.
- 7780-7790 Dark brown to dark brown buff to occasional brown buff Limestone: as above; minor Limestone: light to medium brown brown to cream to tan, microcrystalline to trace very fine crystalline, chalky in part, organic (algae?) in part, slightly argillaceous, slightly fossiliferous, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 7790-7830 Limestone: grey brown to dark grey brown to buff brown, cryptocrystalline to trace microcrystalline, argillaceous to argillaceous in part, trace crinoids and stromatoporoids, dense; interbedded with minor Limestone: light to medium grey, brown to occasional light grey brown to mottled cream to trace cream to cream white, microcrystalline to trace very fine crystalline, slightly argillaceous in part, to argillaceous in part, slightly silty in part, slightly bioclastic to bioclastic in part, slightly bituminous in part, trace calcite crystal veining and infilling, trace brachiopods, ostracods, and crinoids, dense; trace fossil fragments of corals and crinoids; slight trace calcite crystal clusters.
- 7830-7840 Interbedded Limestones: as above.
- 7840-7850 Dark Limestone: as above; occasional light Limestone: as above; Shale: dark grey to light to medium grey green to medium grey, blocky to subfissile, micromicaceous, tough to brittle in part, calcareous.
- 7850-7860 Dark Limestone: as above; minor Limestone: light to medium grey to occasional grey brown to mottled cream, microcrystalline to trace very fine crystalline, argillaceous to argillaceous in part, trace bioclastic, trace calcite crystal infilling, slightly fossiliferous, dense; occasional Shale: as above.
- 7860-7870 Limestones: as above; Shale: medium to occasional dark grey to grey green to occasional dark grey, blocky to subfissile, micromicaceous, tough, calcareous to very calcareous in part.
- 7870-7890 Shale: as above; minor dark Limestone: as above; occasional light Limestone: as above; trace Limestone: light grey to light brown grey to light grey cream, microcrystalline, bioclastic, oolitic in part, dense, trace pyrite fragments.
- 7890-7900 Shale: as above; dark Limestone: as above; Limestone: light to medium grey white to light to medium brown buff, cryptocrystalline to microcrystalline, slightly argillaceous, fossiliferous in part, slightly oolitic in part; trace fossil fragments; trace pyrite fragments.
- GOSSAGE 7900 (-7750)
- 7900-7950 Limestone: dark brown to occasional buff brown to occasional mottled cream, cryptocrystalline to trace microcrystalline, argillaceous, slightly bituminous in part; trace calcite crystal infilling, fossiliferous in part with ostracods, crinoids and possibly stromatoporoids, dense; minor Limestone:

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- light brown to occasional tan, to occasional mottled cream, microcrystalline to trace very fine crystalline, slightly argillaceous in part, slightly bioclastic in part, slight trace calcite crystal infilling, trace pelites and pellets, slight trace brachiopods and ostracods, dense.
- 7950-8000 Dark Limestone: as above; minor to occasional lighter Limestone: as above; trace fossil fragments and imprints.
- 8000-8010 Dark Limestone: as above; occasional light Limestone: as above.
- 8010-8060 Trip Samples: assume as above.
- 8060-8080 Dark Limestone: as above; occasional light Limestone: as above.
- 8080-8130 Limestone: dark brown to buff to dark brown buff, crypto-crystalline, argillaceous to very argillaceous in small part, slightly infilled calcite crystals in part, slight trace bitumen infilling, slight trace micropyrritic to pyrobituminous, slight trace fossiliferous, dense; interbedded with minor Limestone: cream to light brown cream to occasional tan, micro-crystalline to occasional cryptocrystalline, argillaceous in part, slightly silty in small part, slight trace calcite crystal infilling, trace pelletoidal, slight trace fossiliferous, dense.
- 8130-8140 As above; slight trace Limestone: light brown white to cream white, microcrystalline to occasional very fine crystalline, slightly dolomitic, pelletoidal in part, slight trace poor intercrystalline porosity, trace fossil imprints and fragments of brachiopods and ostracods.
- 8140-8200 As above, only dark Limestone is occasional, mottled, cream; trace pelletoidal Limestone: as above.
- 8200-8250 Interbedded dark and light limestones: as above; slight trace pelletoidal Limestone: as above.
- 8250-8280 Limestone: buff to occasional dark brown buff, cryptocrystalline, argillaceous in part, trace calcite crystal infilling, dense; minor Limestone: cream white to light brown cream to occasional mottled buff, cryptocrystalline to microcrystalline, very slightly fossiliferous, bioclastic in small part, dense; slight trace pelletoidal Limestone: as above.
- 8280-8310 Limestone: buff to occasional dark brown buff, cryptocrystalline to occasional microcrystalline, slightly argillaceous to argillaceous in part, slightly dolomitic in part, trace calcite



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- dolomite crystal infilling, dense; minor light Limestone: as above; slight trace fossil fragments.
- 8310-8360 Limestone: dark brown buff to buff to mottled cream, cryptocrystalline to slightly microcrystalline, argillaceous in part, slightly bioclastic, slight trace pelletoidal, dense; occasional Limestone: cream white to white, microcrystalline to trace very fine crystalline, dolomitic in small part, trace bioclastic, dense.
- 8360-8470 Dark Limestone: as above only becomes alternately, dolomitic to slightly dolomitic interbedded with minor Limestone: cream white to white, microcrystalline, chalky in part, slightly dolomitic in part.
- 8470-8480 Dark Limestone: as above; occasional light Limestone: as above; trace Dolomite: light grey to light grey brown to light brown buff, cryptocrystalline to microcrystalline, calcareous to slightly calcareous, dense.
- 8480-8490 Limestones: as above only dolomitic in part; occasional Dolomite: as above.
- 8490-8500 Dark Limestone: as above; Dolomite: as above; occasional light Limestone: as above.
- 8500-8530 Limestone: dark brown buff to buff to mottled cream, cryptocrystalline to microcrystalline, dolomitic to dolomitic in part, slightly argillaceous in part, dense; minor Dolomite: light grey to light brown buff, microcrystalline to trace very fine crystalline, slightly calcareous to calcareous in part, dense; occasional Limestone: cream white to white to tan white, microcrystalline to occasional cryptocrystalline, chalky in part, slightly dolomitic in part, slight trace pelletoidal, dense.
- 8530-8560 Darker Limestone: as above; minor Limestone: cream white to light brown buff, cryptocrystalline to microcrystalline, chalky in part, pelletoidal in small part, slightly dolomitic in part, dense; occasional Dolomite: as above.
- 8560-8570 Limestone: dark grey buff to dark brown buff to mottled cream to occasional buff, cryptocrystalline to occasional microcrystalline, argillaceous to slightly argillaceous in part, dolomitic, slight trace calcite crystal infilling, slight trace fossiliferous, dense; minor Limestone: cream to light grey cream to occasional buff cream, cryptocrystalline to occasional microcrystalline, chalky in part, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 8570-8590 Poor Samples but assume as above.
- 8590-8600 Poor samples but assume as above; with trace Dolomite: buff, cryptocrystalline to occasional microcrystalline, calcareous in part, dense.
- 8600-8610 Poor samples but assume: Dolomite: buff, cryptocrystalline to occasional microcrystalline, slightly calcareous in part, trace grey Shale partings, dense; occasional Limestone: brown buff to dark grey buff, cryptocrystalline, argillaceous to argillaceous in part, slightly dolomitic in part, dense; occasional Limestone: cream to cream buff, cryptocrystalline to microcrystalline, chalky in part, dense.
- 8610-8640 Dolomite: light grey buff to occasional buff to buff brown, microcrystalline to occasional cryptocrystalline, slightly calcareous in part, slight trace fossiliferous, dense; minor Limestone: medium to dark buff brown to occasional mottled cream, microcrystalline to occasional cryptocrystalline, argillaceous, dolomitic in part, dense; occasional silty slightly dolomitic Shale partings.
- 8640-8660 Poor samples but assume as above but Dolomite is calcareous to calcareous in part.
- 8660-8680 Limestone: dark brown to buff to occasional mottled cream, cryptocrystalline to occasional microcrystalline, argillaceous to argillaceous in part, dolomitic in part, dense; minor Limestone: cream white to light grey buff to buff brown, cryptocrystalline to microcrystalline, slightly chalky in part, dense; trace to occasional Dolomite: light grey buff to light grey white, microcrystalline to occasional cryptocrystalline, calcareous in part, dense; slight trace grey Shale partings.
- 8680-8700 Limestone: dark brown buff to dark grey buff to buff to trace mottled cream, cryptocrystalline to occasional microcrystalline, argillaceous to slightly argillaceous, dolomitic to dolomitic in part, slight trace fossiliferous, trace silty grey to grey green Shale partings, dense; occasional Limestone: cream to cream white to light grey, cryptocrystalline to occasional microcrystalline, chalky in part, slightly dolomitic in part, dense.
- 8700-8710 Limestone: dark brown buff to dark grey buff to buff to trace mottled cream, cryptocrystalline to occasional microcrystalline, argillaceous to slightly argillaceous, slightly dolomitic, very

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

slight trace fossiliferous, slight trace grey green Shale partings, dense; minor Limestone: light grey, white to cream to occasional buff cream, microcrystalline to occasional cryptocrystalline, chalky in part, dense; occasional Limestone: light grey buff to light grey white, cryptocrystalline to trace microcrystalline, dolomitic, dense.

- 8710-8720 Limestone: dark grey buff to dark brown buff to buff, cryptocrystalline to microcrystalline, argillaceous to argillaceous in part, dolomitic, slight trace fossiliferous, trace grey green silty dolomitic Shale partings, dense; minor Limestone: cream to light grey cream, microcrystalline to cryptocrystalline, chalky in part, dolomitic in part, dense.
- 8720-8740 Dolomite: buff to occasional light grey buff, microcrystalline to occasional cryptocrystalline, calcareous in part, slight trace grey Shale partings, dense; occasional Limestone: as above.
- 8740-8760 Dolomite: light grey buff to buff to light grey to occasional light brown grey, microcrystalline to trace cryptocrystalline to trace very fine crystalline, slightly calcareous to calcareous in part, argillaceous in small part, trace light grey Shale partings, trace bitumen infilling, slight trace dolomite crystal clusters, dense to trace poor intercrystalline porosity; occasional dolomitic dark Limestone: as above; occasional light Limestone: as above.
- 8760-8770 Dolomite: light to medium brown buff to buff to trace light grey buff, microcrystalline to occasional cryptocrystalline to trace very fine crystalline, slightly calcareous, trace grey Shale partings, slight trace bitumen infilling, slight trace Dolomite crystal clusters, dense to slight trace poor intercrystalline porosity; occasional dolomitic dark Limestone: as above; trace light Limestone: as above.
- 8770-8800 Dolomite: buff to occasional light grey to light brown buff, microcrystalline to occasional cryptocrystalline to trace to occasional very fine crystalline, calcareous to calcareous in part, trace grey green Shale partings, slight trace pyrite infilling, slight trace bitumen infilling, dense to trace poor intercrystalline porosity, occasional to trace dolomitic dark Limestone: as above; trace light Limestone: as above.
- 8800-8810 Limestone: light brown to buff to light grey cream to occasional cream, microcrystalline to occasional cryptocrystalline, slightly argillaceous in part, dolomitic in part, trace grey Shale partings, dense; trace dark Limestone: as above; trace chalky Limestone: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 8810-8820 Limestone: dark grey to buff to buff to light grey buff, cryptocrystalline to trace microcrystalline, argillaceous to slightly argillaceous in part, slightly dolomitic, trace fossiliferous with ostracods, slight trace pellets, slight trace grey Shale partings, dense; occasional Limestone: light grey cream to cream to light brown cream, cryptocrystalline to trace microcrystalline, chalky to chalky in part, dense.
- 8820-8830 Dark Limestone: as above with occasional mottled cream; minor light Limestone: as above.
- 8830-8850 Poor samples but assume as above.
- 8850-8870 Limestone: buff to cream buff to light grey buff to occasional mottled cream, cryptocrystalline to occasional microcrystalline, slightly dolomitic in part, slight trace grey green Shale partings, slightly chalky in part, slightly argillaceous in part, dense; trace dark Limestone: as above.
- 8870-8900 Limestone: as above; occasional dark Limestone: as above.
- 8900-8910 As above; slight trace fossil fragments (i.e. brachiopods).
- 8910-8940 Limestone: light grey to light brown to light grey to brown buff to occasional mottled cream to cream, cryptocrystalline to occasional microcrystalline, chalky in part, slightly argillaceous to argillaceous in part, very slightly fossiliferous, very slight trace calcite crystal infilling, dense; interbedded with minor Limestone: dark grey buff, cryptocrystalline, very argillaceous, very slight trace fossiliferous, slight trace pellets, dense.
- 8940-8950 Light Limestone: as above; slightly dolomitic in part; minor dark Limestone: as above; trace Dolomite: buff, microcrystalline to trace very fine crystalline, calcareous in part, dense.
- 8950-8960 Limestone: light grey to light brown to light grey to brown buff to occasional mottled cream to cream, cryptocrystalline to microcrystalline, chalky in part, slightly argillaceous, slightly dolomitic to dolomitic in part, very slightly fossiliferous, dense; interbedded with minor Limestone: dark grey buff, cryptocrystalline to occasional microcrystalline, very argillaceous, dolomitic in part, very slight trace fossiliferous, dense; occasional Dolomite: buff, microcrystalline to occasional very fine crystalline, slightly calcareous in part, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 8960-8970 As above with slight trace very fine to fine dolomite crystal clusters indicating slight trace very poor intercrystalline porosity.
- 8970-8980 Limestone: dark grey buff to buff to light grey cream to brown cream, cryptocrystalline to occasional microcrystalline, argillaceous to argillaceous in part, dolomitic to dolomitic in part, trace grey Shale partings, dense; occasional Dolomite: buff, cryptocrystalline to trace microcrystalline, calcareous in part, dense.
- 8980-8990 Limestone: as above; Dolomite: as above.
- 8990-9010 Limestone: as above, only slightly dolomitic to dolomitic in part; trace Dolomite: as above.
- 9010-9020 Limestone: dark grey buff to occasional brown grey buff, cryptocrystalline to occasional microcrystalline, argillaceous, reefoid, trace calcite crystal infilling and veining, slightly bituminous, slightly bioclastic, fossiliferous, occasional stromatoporoids, corals and brachiopod imprints, dense; Limestone: light to medium grey to occasional dark grey, calcilutite to calcisiltite, bioclastic in part, organic, fossiliferous, slight trace calcite veining and infilling, slightly argillaceous to argillaceous in part, occasional fossil fragments of crinoids and possibly algae, dense, trace Dolomite: as above.
- 9020-9030 Dark Limestone: as above; minor light Limestone: as above.
- 9030-9220 Limestone: dark grey buff to trace mottled brown, cryptocrystalline to occasional to trace microcrystalline, very argillaceous to argillaceous, slightly bituminous to bituminous in part, fossiliferous, reefoid, slight trace to trace calcite crystal infilling and veining, occasional traces of fossils and/or fragments of brachiopods, ostracods, corals, stromatoporoids and numerous imprints of them, dense; interbedded with minor Limestone: medium to occasional light and dark grey calcilutite to calcisiltite, organic, bioclastic in part, occasional to trace calcite infilling and veining, fossiliferous, slightly argillaceous to argillaceous in part, imprints and fragments of crinoids, and possibly algae, dense.
- 9220-9250 Trip samples: assume as above.
- 9250-9260 Limestone: dark grey buff to dark brown buff to occasional mottled cream buff, cryptocrystalline to trace microcrystalline, argillaceous to slightly argillaceous, very slightly fossilifer-

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- our, dolomitic in part, dense; minor Limestone: light brown to light brown cream, microcrystalline, slightly argillaceous, very slightly fossiliferous, slightly dolomitic in part, dense.
- 9260-9270 Limestone: dark grey buff to dark brown buff to occasional mottled cream buff, cryptocrystalline to trace microcrystalline to trace very fine crystalline, argillaceous to slightly argillaceous, very slightly fossiliferous, dolomitic, dense; minor Limestone: light brown to light brown cream, microcrystalline, slightly argillaceous, very slightly fossiliferous, slightly dolomitic to dolomitic in part, dense; Dolomite: dark grey buff to dark brown buff to occasional mottled cream buff, microcrystalline to trace very fine crystalline, argillaceous to slightly argillaceous, calcareous to slightly calcareous in part, dense, minor Dolomite: light brown to light brown cream, microcrystalline, calcareous, dense.
- 9270-9280 Dolomite: dark grey buff to dark brown buff to occasional mottled cream buff, microcrystalline to trace very fine crystalline, argillaceous to slightly argillaceous, calcareous to slightly calcareous in part, dense; minor Dolomite: light brown to light brown cream, microcrystalline, calcareous, dense; occasional Limestone: light brown to light brown cream, microcrystalline, dolomitic to dolomitic in part.
- 9280-9310 Dolomite: dark brown to dark grey to trace buff, microcrystalline, to very fine crystalline, slightly argillaceous, trace calcite crystals and Dolomite rhombs infilling, calcareous in part to slightly calcareous, dense to slight trace poor intercrystalline and microvuggy porosity; occasional to minor Dolomite: medium brown to mottled cream, microcrystalline, very slightly argillaceous, slight trace calcite crystal veining, calcareous in part, dense.
- 9310-9320 Dolomite: dark brown to dark grey to trace buff, microcrystalline to very fine crystalline, slightly argillaceous, trace calcite crystal infilling and Dolomite rhombs infilling, calcareous in part to slightly calcareous, dense to trace poor intercrystalline and microvuggy porosity; minor Dolomite: medium brown to mottled cream, microcrystalline, slightly argillaceous, calcareous in part, slight trace calcite crystal veining, dense; slight trace calcite crystal clusters.
- 9320-9340 Dolomite: dark brown to dark grey to trace buff, microcrystalline to very fine crystalline, slightly argillaceous, trace calcite crystal infilling, calcareous in part to slightly calcareous, dense to slight trace poor intercrystalline and microvuggy porosity; minor Dolomite: medium brown to mottled cream, microcrystalline, slightly argillaceous to argillaceous, calcareous in part, slight trace calcite crystal veining, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 9340-9370 Limestone: dark grey buff to dark brown buff to occasional mottled cream buff, cryptocrystalline to trace microcrystalline to trace very fine crystalline, argillaceous to slightly argillaceous, very slightly fossiliferous, dolomitic in part, dense; minor Limestone: light brown to light brown cream, microcrystalline, slightly argillaceous, very slightly fossiliferous, slightly dolomitic in part, dense; occasional Dolomite: dark brown to dark grey to trace buff, microcrystalline to very fine crystalline, slightly argillaceous, trace calcite crystal infilling, calcareous in part to slightly calcareous, dense to slight trace poor intercrystalline and microvuggy porosity; trace Dolomite: medium brown to mottled cream, microcrystalline, very slightly argillaceous, slight trace calcite crystal veining, calcareous in part, dense.
- 9370-9380 Limestones: as above; minor dark Dolomite: as above; occasional medium brown to mottled cream Dolomite: as above.
- 9380-9390 Limestones: as above; dark Dolomite: as above; minor medium brown to mottled cream Dolomite: as above.
- 9390-9420 Dolomite: dark grey to occasional mottled brown, microcrystalline to very fine to trace fine crystalline, slightly argillaceous, dense to trace poor intercrystalline and microvuggy porosity; occasional Dolomite: light to medium brown to trace mottled cream, microcrystalline to occasional very fine crystalline, calcareous in part, dense.
- 9420-9430 Dolomite: dark grey to medium brown to medium grey brown, microcrystalline to occasional very fine crystalline, slightly argillaceous in part, calcareous in part, dense; Limestone: dark to medium brown to medium grey brown, microcrystalline, slightly argillaceous in part, dolomitic in part, dense.
- 9430-9450 Dolomite: dark grey to occasional medium brown grey, microcrystalline to occasional very fine crystalline, slightly argillaceous, slightly calcareous, dense to slight trace poor intercrystalline porosity; occasional Limestone: medium to dark brown, microcrystalline, slightly dolomitic in part, dense.
- 9450-9470 Dolomite: dark grey to occasional medium brown grey, microcrystalline to occasional very fine crystalline, slightly argillaceous, calcareous, dense to slight trace poor intercrystalline porosity; Limestone: as above.
- 9470-9480 Limestone: dark grey to medium to dark brown to occasional mottled cream, microcrystalline, dolomitic in part, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 9480-9490 Limestone: medium to occasional light brown to occasional dark grey to occasional grey brown, microcrystalline to trace very fine crystalline, slightly argillaceous to argillaceous in part, dense.
- 9490-9510 Dolomite: light to medium brown to medium grey brown to trace dark grey, microcrystalline to trace very fine crystalline, slightly argillaceous in part, calcareous to slightly calcareous, very slightly fossiliferous, dense to very slight trace poor intercrystalline porosity; slight trace calcite crystal clusters.
- 9510-9550 Trip samples: assume as above.
- 9550-9560 Poor sample but assume: Dolomite: dark grey to dark grey buff to medium grey, microcrystalline, argillaceous, trace calcite crystal infilling, slightly calcareous, dense; occasional Dolomite: light brown to light grey brown, microcrystalline, slightly argillaceous, calcareous, trace calcite crystal infilling and veining, dense.
- 9560-9570 Limestone: dark grey to dark grey brown to buff, microcrystalline, dolomitic, argillaceous, trace calcite crystal infilling, dense; minor Limestone: light brown to light grey brown to occasional mottled cream, microcrystalline, slightly dolomitic to dolomitic in part, slightly argillaceous, dense; trace calcite crystal clusters.
- 9570-9580 Limestone: medium brown to dark grey brown to occasional light brown to trace buff, microcrystalline to occasional cryptocrystalline, argillaceous to slightly argillaceous in part, slightly dolomitic to slightly dolomitic in part, slight trace calcite crystal infilling, dense to very slight trace poor micro-vuggy and intercrystalline porosity; slight trace calcite crystal clusters.
- 9580-9590 As above only slightly dolomitic to dolomitic in part.
- 9590-9600 Dolomite: dark grey buff to dark grey brown to occasional medium brown to trace buff, microcrystalline to occasional cryptocrystalline, to occasional very fine crystalline, slightly calcareous to calcareous in part, slightly argillaceous, slight trace calcite crystal infilling, dense to trace poor micro-vuggy and intercrystalline porosity, slight trace calcite crystal clusters.
- 9600-9610 Limestone: dark grey buff to occasional buff brown to occasional medium brown, microcrystalline to occasional cryptocrystalline, argillaceous to slightly argillaceous, very slightly dolomitic to dolomitic in part, slight trace calcite crystal infilling,



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 9480-9490 Limestone: medium to occasional light brown to occasional dark grey to occasional grey brown, microcrystalline to trace very fine crystalline, slightly argillaceous to argillaceous in part, dense.
- 9490-9510 Dolomite: light to medium brown to medium grey brown to trace dark grey, microcrystalline to trace very fine crystalline, slightly argillaceous in part, calcareous to slightly calcareous, very slightly fossiliferous, dense to very slight trace poor intercrystalline porosity; slight trace calcite crystal clusters.
- 9510-9550 Trip samples: assume as above.
- 9550-9560 Poor sample but assume: Dolomite: dark grey to dark grey buff to medium grey, microcrystalline, argillaceous, trace calcite crystal infilling, slightly calcareous, dense; occasional Dolomite: light brown to light grey brown, microcrystalline, slightly argillaceous, calcareous, trace calcite crystal infilling and veining, dense.
- 9560-9570 Limestone: dark grey to dark grey brown to buff, microcrystalline, dolomitic, argillaceous, trace calcite crystal infilling, dense; minor Limestone: light brown to light grey brown to occasional mottled cream, microcrystalline, slightly dolomitic to dolomitic in part, slightly argillaceous, dense; trace calcite crystal clusters.
- 9570-9580 Limestone: medium brown to dark grey brown to occasional light brown to trace buff, microcrystalline to occasional cryptocrystalline, argillaceous to slightly argillaceous in part, slightly dolomitic to slightly dolomitic in part, slight trace calcite crystal infilling, dense to very slight trace poor micro-vuggy and intercrystalline porosity; slight trace calcite crystal clusters.
- 9580-9590 As above only slightly dolomitic to dolomitic in part.
- 9590-9600 Dolomite: dark grey buff to dark grey brown to occasional medium brown to trace buff, microcrystalline to occasional cryptocrystalline, to occasional very fine crystalline, slightly calcareous to calcareous in part, slightly argillaceous, slight trace calcite crystal infilling, dense to trace poor micro-vuggy and intercrystalline porosity, slight trace calcite crystal clusters.
- 9600-9610 Limestone: dark grey buff to occasional buff brown to occasional medium brown, microcrystalline to occasional cryptocrystalline, argillaceous to slightly argillaceous, very slightly dolomitic to dolomitic in part, slight trace calcite crystal infilling,

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- dense to slight trace poor microvuggy and intercrystalline porosity.
- 9610-9620 As above only dolomitic to slightly dolomitic.
- 9620-9630 Dolomite: medium to dark brown to grey buff to occasional light brown to trace dark grey buff, microcrystalline to trace very fine crystalline, slightly argillaceous, slightly calcareous to calcareous, in part, slight trace calcite crystal veining and infilling, dense to slight trace poor microvuggy and intercrystalline porosity; slight trace calcite crystal clusters.
- 9630-9640 Dolomite: medium to dark brown to grey buff to light brown to trace buff, microcrystalline to occasional very fine crystalline, slightly argillaceous, calcareous, dense to trace poor microvuggy and intercrystalline porosity.
- 9640-9650 Limestone: dark grey buff to medium to dark brown to occasional light brown to trace buff, microcrystalline to trace very fine crystalline to trace cryptocrystalline, slightly argillaceous to argillaceous in part, dolomitic to slightly dolomitic, dense to slight trace poor porosity.
- 9650-9660 Limestone: dark grey buff to medium to dark brown to occasional light grey brown to trace buff, microcrystalline to occasional cryptocrystalline, slightly argillaceous to argillaceous in part, slightly dolomitic, dense to very slight trace poor porosity.
- 9660-9670 Limestone: dark grey buff to dark brown to occasional medium grey brown to trace buff, microcrystalline to occasional cryptocrystalline, argillaceous to slightly argillaceous in part, slightly dolomitic, dense.
- 9670-9680 Dolomite: dark grey buff to dark brown buff to occasional buff to light grey brown, microcrystalline to occasional very fine crystalline, argillaceous to slightly argillaceous in part, calcareous to calcareous in part, slight trace calcite crystal infilling, dense to trace poor microvuggy and intercrystalline porosity; trace Shale: grey green, blocky, micromicaceous, dolomitic.
- 9680-9690 Dolomite: light to medium grey brown to tan to trace dark grey to trace cream, microcrystalline to occasional very fine crystalline, argillaceous to slightly argillaceous, slightly calcareous in part, dense to slight trace poor intercrystalline porosity; slight trace calcite crystal clusters; trace Shale: as above.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 9690-9700 Dolomite: medium to dark grey brown to tan to trace buff, microcrystalline to trace very fine, argillaceous to argillaceous in part, calcareous to slightly calcareous, slightly silty in small part, dense; trace Shale: dark grey, blocky, micromicaceous, dolomitic.
- 9700-9710 Dolomite: as above; occasional Limestone: medium to dark brown grey, microcrystalline, argillaceous, dense; occasional Shale: medium to dark green to medium to dark grey, blocky, micromicaceous, dolomitic; trace Dolomite: light grey green to light grey buff, cryptocrystalline, shaly in part, dense.
- 9710-9720 Dolomite: light grey to light grey green to occasional light grey white, cryptocrystalline to occasional microcrystalline, shaly in part, dense; occasional Dolomite: as above; trace Limestone: buff brown to medium to dark brown, cryptocrystalline to microcrystalline, slightly argillaceous to argillaceous in part, slightly dolomitic in part, dense; slight trace Shale: as above.
- 9720-9734 Dolomite: light grey to light grey white to occasional light grey green, cryptocrystalline to occasional microcrystalline, shaly in small part, slightly micropyrritic to pyritic in part, dense; occasional Limestone: as above; occasional Dolomite: as above; trace Shale: as above.
- SILURIAN-ORDOVICIAN RONNING 9734 (-9554)
- 9734-9760 Dolomite: light grey to light grey white to trace light grey green, cryptocrystalline to occasional microcrystalline, very slight micropyrritic, very slight trace fossiliferous, dense.
- 9760-9770 Dolomite: light grey white to light grey to buff to trace white to trace light grey green, cryptocrystalline to occasional microcrystalline, slightly argillaceous in part, slightly calcareous in small part, very slight trace micropyrritic, slight trace fossiliferous, slight trace in-filled quartz grains, trace green Shale partings, dense.
- 9770-9780 Dolomite: light grey to light grey white to occasional buff to trace light grey green, cryptocrystalline to occasional microcrystalline, slightly argillaceous in part, slightly calcareous in small part, very slight trace fossiliferous, very slight trace micropyrritic, slight trace green Shale partings, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 9780-9790 Dolomite: light grey white to occasional light tan to buff to slight trace light grey green, cryptocrystalline to occasional microcrystalline, slightly calcareous in small part, dense; occasional Limestone: cream white to white, calcilutite, chalky, trace fossiliferous, dense.
- 9790-9810 Dolomite: light grey white to light tan to buff, cryptocrystalline to microcrystalline, calcareous in part to slightly calcareous, slightly fossiliferous in part, dense; minor Limestone: white to light grey white, microcrystalline to occasional cryptocrystalline, chalky, slightly fossiliferous, slightly dolomitic in part, dense.
- 9810-9830 Limestone: as above; occasional calcareous Dolomite: as above.
- 9830-9860 Dolomite: light grey to light tan to occasional light grey white to trace medium grey, cryptocrystalline to occasional microcrystalline, very calcareous to calcareous, dense; Limestone: cream white to light grey white to occasional medium grey to light tan, microcrystalline to occasional cryptocrystalline, chalky to chalky in part, slightly fossiliferous, dense.
- 9860-9880 Dolomite: light grey white to light tan to buff to occasional light to trace medium grey, cryptocrystalline to occasional microcrystalline, calcareous to very calcareous in part, slightly argillaceous in part, dense; occasional Limestone: as above.
- 9880-9900 Dolomite: light grey white to light tan to buff to trace medium grey, cryptocrystalline to occasional microcrystalline, calcareous to very calcareous, dense; minor Limestone: as above.
- 9900-9920 Dolomite: light tan to buff to cream white to trace medium grey, cryptocrystalline to microcrystalline, very calcareous to calcareous, dense; Limestone: cream white to white, calcilutite, chalky, slightly fossiliferous in part, dense.
- 9920-9940 Dolomite: light tan to buff to occasional medium grey, cryptocrystalline to occasional microcrystalline, calcareous to slightly calcareous, dense; occasional Limestone: as above.
- 9940-9970 Dolomite: light to medium grey to buff to trace dark grey brown to trace cream white, cryptocrystalline to trace microcrystalline, slightly argillaceous to argillaceous in part, calcareous in part to slightly calcareous in part, dense; very slight trace calcite crystal clusters.

2. GEOLOGICAL SUMMARY, CONT'D.(1) Sample Descriptions - Cont'd.

- 9,970-10,030 Dolomite: light to medium grey to occasional buff to trace dark grey brown, cryptocrystalline to trace microcrystalline, slightly silty in small part, slightly calcareous in part, dense.
- 10,030-10,070 Dolomite: light to medium grey to occasional buff to trace dark grey brown, cryptocrystalline, slightly calcareous in part, dense.
- 10,070-10,220 Dolomite: medium grey to minor grey buff to buff to slight trace to trace dark grey brown, cryptocrystalline to trace microcrystalline, slightly calcareous in part, dense.
- 10,220-10,240 Dolomite: medium grey to buff to occasional light tan to trace cream, cryptocrystalline to occasional microcrystalline to slight trace very fine crystalline, calcareous in small part to slightly calcareous in part.
- 10,240-10,260 Dolomite: medium to occasional light to trace dark grey brown to buff, cryptocrystalline to occasional microcrystalline, slightly calcareous, slightly silty in part, very slightly argillaceous, dense; minor Dolomite: cream white to light tan to occasional buff, cryptocrystalline to microcrystalline to trace very fine crystalline, slightly calcareous in part, dense to very slight trace poor porosity; slight trace calcite crystal clusters.
- 10,260-10,280 Dolomite: cream white to light tan to buff, cryptocrystalline to microcrystalline to slight trace very fine crystalline, slightly calcareous in part, dense; abundant grey Dolomite: as above.
- 10,280-10,310 Dolomite: buff to light tan to occasional cream white, cryptocrystalline to occasional microcrystalline, slightly calcareous in part, dense; minor Dolomite: medium to occasional light grey to trace dark grey brown, cryptocrystalline, argillaceous in small part, slightly silty in small part, dense.
- 10,310-10,350 Dolomite: medium to occasional light grey to trace dark grey brown, cryptocrystalline, slightly argillaceous, slightly calcareous in part, dense; Dolomite: buff to light tan to occasional cream white, cryptocrystalline to occasional microcrystalline, slightly calcareous to calcareous in small part, dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 10,350-10,410 Dolomite: light to medium grey to buff, cryptocrystalline to occasional microcrystalline, slightly calcareous to calcareous in part, dense; occasional Dolomite: cream to cream buff, microcrystalline, calcareous to very calcareous in part, dense.
- 10,410-10,44 Dolomite: light to medium grey to buff, cryptocrystalline to trace microcrystalline, slightly calcareous in part, dense; trace Dolomite: cream to cream buff, microcrystalline, calcareous to very calcareous, dense.
- 10,440-10,450 Dolomite: white to light grey white to light grey to buff to occasional medium grey, cryptocrystalline to microcrystalline to trace very fine crystalline, dense; very slight trace calcite crystal clusters.
- 10,450-10,460 Dolomite: light to medium to trace dark grey to buff to trace cream white, cryptocrystalline to occasional microcrystalline, dense; very slight trace calcite crystal clusters.
- 10,460-10,490 Dolomite: light to medium to occasional dark grey to buff to trace cream white, cryptocrystalline to occasional microcrystalline to trace very fine crystalline, argillaceous in part to slightly argillaceous in part, slightly silty in part, slightly calcareous in part, dense; slight trace calcite crystal clusters.
- 10,490-10,500 Dolomite: light to medium to trace dark grey to buff to occasional light grey cream, cryptocrystalline to occasional microcrystalline to trace very fine crystalline, argillaceous in part to slightly argillaceous in part, calcareous to slightly calcareous, very slightly silty in small part, dense to slight trace poor intercrystalline porosity; slight trace calcite crystal clusters.
- 10,500-10,510 Dolomite: light to medium grey to trace dark grey to light grey buff to trace buff, cryptocrystalline to trace microcrystalline, argillaceous in part to slightly argillaceous in part, silty in small part, very slight trace calcite crystal infilling, dense; trace Dolomite: buff, very fine to occasional microcrystalline, very slightly silty, dense to occasional poor intercrystalline porosity.
- 10,510-10,520 Dolomite: light grey buff to light to medium grey to trace dark grey, cryptocrystalline to occasional microcrystalline, slightly argillaceous to argillaceous in part, slightly silty in part, calcareous in part to slightly

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

- calcareous in part, dense; minor Dolomite: buff, microcrystalline to very fine crystalline to trace cryptocrystalline, slightly argillaceous in small part, dense to occasional poor to fair intercrystalline porosity; very slight trace calcite crystal clusters.
- 10,520-10,540 Dolomite: light grey buff to light to medium grey to trace dark grey, cryptocrystalline to occasional microcrystalline, slightly argillaceous to argillaceous in part, slightly silty in part, calcareous in part to slightly calcareous in part, slight trace cherty, slight trace micropyrritic, dense; occasional Dolomite: buff, microcrystalline to occasional cryptocrystalline to occasional very fine crystalline, dense to slight trace poor intercrystalline porosity; very slight trace calcite crystal clusters.
- 10,540-10,550 Dolomite: light grey buff to light to occasional medium grey to trace dark grey, cryptocrystalline to microcrystalline, slightly argillaceous to argillaceous, slightly silty in part, calcareous to slightly calcareous, dense; occasional Dolomite: buff, microcrystalline to very fine crystalline, slightly argillaceous in small part, dense to occasional poor to fair intercrystalline porosity.
- 10,550-10,560 Grey Dolomite: as above; Dolomite: buff, microcrystalline to occasional very fine crystalline to occasional cryptocrystalline to trace fine crystalline, slightly argillaceous in small part, dense to slight trace poor intercrystalline porosity.
- 10,560-10,570 Dolomite: light grey buff to light to occasional medium grey to slight trace dark grey to occasional buff to trace cream white, cryptocrystalline to occasional microcrystalline, slightly argillaceous in part, slightly calcareous in part, dense; slight trace buff Dolomite: as above, slight trace calcite crystal clusters.
- 10,570-10,580 Dolomite: as above; slight trace calcite crystals.
- 10,580-10,590 Dolomite: as above; minor Dolomite: buff to cryptocrystalline to occasional microcrystalline to trace very fine crystalline, dense to very slight trace poor intercrystalline porosity; slight trace calcite crystals.

2. GEOLOGICAL SUMMARY, CONT'D.

(d) Sample Descriptions - Cont'd.

- 10,590-10,600 Dolomite: light grey buff to light grey to occasional medium grey to slight trace cream white, cryptocrystalline to occasional microcrystalline to trace very fine crystalline, slightly argillaceous in small part, dense; slight trace calcite crystals.
- 10,600-10,620 Dolomite: light to medium to dark grey to occasional mottled cream to occasional buff to occasional light grey cream, cryptocrystalline to microcrystalline, argillaceous in part to slightly argillaceous in part, slightly calcareous in part to calcareous in small part, slightly silty in small part, dense.
- 10,620-10,640 Dolomite: light to medium to occasional dark grey to buff to trace light grey cream to cream white, cryptocrystalline to occasional microcrystalline to trace very fine crystalline, slightly argillaceous in part to argillaceous in small part, slightly silty in small part, slightly calcareous in part, slightly micropyrictic in small part, slight trace grey green Shale partings, dense; slight trace calcite crystals.
- 10,640-10,690 Dolomite: medium to light grey to occasional light grey buff to occasional mottled cream to trace dark grey, cryptocrystalline to microcrystalline to trace very fine crystalline, argillaceous to slightly argillaceous, calcareous to slightly calcareous, slightly silty in part, dense.
- 10,690-10,710 Dolomite: light to medium grey to trace dark grey to occasional mottled cream to trace buff, microcrystalline to cryptocrystalline to slight trace very fine to fine, slightly argillaceous, slightly calcareous in part to calcareous in part, dense.
- 10,710-10,730 Dolomite: light to medium grey to slight trace dark grey to mottled cream to trace buff, microcrystalline to occasional cryptocrystalline to slight trace very fine to fine crystalline, slightly argillaceous, slightly calcareous to calcareous in part, silty in part, dense.
- 10,730-10,740 Dolomite: light to medium to trace dark grey to trace mottled cream to trace buff, cryptocrystalline to occasional microcrystalline to trace very fine crystalline, slightly argillaceous in part to argillaceous in small part, slightly calcareous to calcareous in part to very calcareous in part, slightly silty in part, slight trace sandy, dense.



2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 10,740-10,760 Dolomite: light to medium to slight trace dark grey to trace light grey cream to cream white to slight trace mottled cream, cryptocrystalline to occasional microcrystalline to trace very fine crystalline to slight trace fine crystalline, slightly calcareous in part to calcareous in part to very calcareous in small part, slightly argillaceous in part, dense, slight trace calcite crystal clusters.
- 10,760-10,770 Dolomite: light to medium to trace dark grey to trace light grey cream to trace cream white, microcrystalline to occasional cryptocrystalline, slightly calcareous in part, slightly argillaceous, slightly silty in part, dense.
- 10,770-10,790 Dolomite: medium to dark to occasional light grey to trace mottled cream, cryptocrystalline to trace microcrystalline to trace very fine to trace fine crystalline, slightly argillaceous, slightly silty in small part, slightly calcareous in part to calcareous in small part, very slight trace calcite veining, dense; interbedded with Dolomite: light to medium grey to occasional grey green, fine to medium crystalline, subhedral, slightly glauconitic in part, slightly silty in part, very slightly micropyrritic in part, dense; trace medium to coarse calcite crystal clusters.
- 10,790-10,820 Dolomite: light to medium to occasional dark grey to occasional mottled cream to trace cream white, cryptocrystalline to trace microcrystalline to trace very fine crystalline, slightly silty in part, slightly argillaceous in small part, slightly calcareous in part to calcareous in part, very slight trace calcite veining, dense; minor Dolomite: light to medium grey to occasional grey, green to trace white, fine to medium to trace very fine crystalline, subhedral to occasional euhedral, silty in part to slightly silty in part, slightly argillaceous in small part, slightly glauconitic in part, slightly micropyrritic in part, dense; slight trace calcite crystal clusters.
- 10,820-10,830 Dolomite: as above; occasional fine to medium crystalline; Dolomite: as above; Dolomite: cream white to light grey cream, microcrystalline, very calcareous to calcareous in part, chalky in part, slightly argillaceous, dense.
- 10,830-10,870 Dolomite: light grey to light grey cream to occasional cream white to trace medium grey, microcrystalline, slightly chalky to chalky in part, very calcareous to calcareous, slightly argillaceous, slight trace fossiliferous (oolitic), dense.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 10,870-10,880 Dolomite: light grey to light grey cream to occasional medium grey, microcrystalline to trace cryptocrystalline, slightly chalky in part to slightly calcareous to calcareous in part to very calcareous in small part, slightly argillaceous, dense; very slight trace green Shale partings.
- 10,880-10,890 Dolomite: light grey to light grey cream to occasional medium grey, microcrystalline to occasional cryptocrystalline, slightly calcareous in part to calcareous in part, slightly argillaceous, dense.
- 10,890-10,910 Dolomite: light grey to light grey cream to occasional medium to dark grey to trace buff brown, microcrystalline to trace cryptocrystalline, slightly argillaceous to argillaceous in part, slightly calcareous to calcareous in part to very calcareous in part, slightly silty in part, dense.
- 10,910-10,920 Dolomite: light to medium buff grey to light to medium to occasional dark grey to trace light grey cream, microcrystalline to occasional cryptocrystalline, slightly argillaceous to argillaceous in part, slightly calcareous to calcareous in part, slightly silty in part, dense.
- 10,920-10,940 Dolomite: light to medium grey cream to medium to dark grey brown to trace light grey cream, microcrystalline, slightly argillaceous to argillaceous, slightly calcareous to calcareous, slightly silty in small part, slightly chalky in small part, very slight trace dark grey Shale partings, dense.
- 10,940-10,950 Dolomite: light grey brown to brown buff, microcrystalline to trace cryptocrystalline, silty, slightly calcareous, dense; interbedded with minor Dolomite: medium to occasional dark grey brown, microcrystalline, slightly argillaceous to argillaceous in part, slightly calcareous, slightly silty in part, slightly sandy in small part, slight trace fossiliferous (oolitic), dense; occasional Shale: dark grey, blocky, micromicaceous, slightly calcareous to calcareous to dolomitic, dense.
- 10,950-10,960 Dolomite: medium to dark grey brown to occasional buff to occasional light to medium grey, microcrystalline to trace fine to medium crystalline, argillaceous in part to slightly argillaceous, slightly calcareous to calcareous in part, dense to very slight trace poor intercrystalline porosity, slight trace euhedral to subhedral fine to medium crystalline; Dolomite crystal clusters indicating slight trace poor intercrystalline to vuggy porosity, slight trace pyrite fragments.

2. GEOLOGICAL SUMMARY, CONT'D.(d) Sample Descriptions - Cont'd.

- 10,960-10,980 Dolomite: medium to dark grey brown to occasional light grey brown to trace buff, microcrystalline to trace very fine crystalline to trace fine crystalline, argillaceous to slightly argillaceous, slightly calcareous to calcareous in part, very slightly silty in part, slight trace Shale partings, dense to slight trace poor intercrystalline porosity; slight trace subhedral to euhedral fine to medium Dolomite crystal clusters indicating, slight trace poor intercrystalline porosity.
- 10,980-11,000 Dolomite: medium to dark to occasional light grey brown, very fine to fine to trace medium to occasional microcrystalline, slightly argillaceous, dense to slight trace to trace poor intercrystalline porosity; very slight trace subhedral to euhedral fine to medium Dolomite crystal clusters, slight trace calcite crystal clusters.
- 11,000-11,020 As above but trace poor intercrystalline porosity.
- 11,020-11,040 Dolomite: dark to minor medium grey brown to occasional light grey brown, microcrystalline to very fine to occasional fine to trace medium crystalline, argillaceous, slightly calcareous to calcareous in part, dense to slight trace poor intercrystalline porosity; slight trace fine to medium poor intercrystalline porosity; slight trace fine to medium Dolomite crystal clusters indicating slight trace poor porosity; slight trace calcite crystal clusters.
- 11,040-11,050 Dolomite: medium to dark brown grey to occasional light grey brown, microcrystalline to occasional very fine to occasional fine to trace medium crystalline, argillaceous, slightly calcareous to calcareous, slight trace calcite veining, slightly silty in part, dense; slight trace poor porosity; trace calcite crystal clusters.

TOTAL DEPTH 11,050 (-10,870)

(e) Paleontological Determinations:

Nil.

3. ENGINEERING SUMMARY:

(a) Drill Stem Tests:

DST #1: 10890-11050 (Ronning) April 15/72.  
90-50-60. GIP on VO, SAB decr. to FAB. No  
GTS. Rec'd 450' drilling mud, 4554' slightly  
gassy salt water, 360' slightly gassy muddy  
salt water, 30' gasified mud at top of tool.  
HP 5299/5142, SI 5103/5018, FP 2363/4128.

DST #2: 9620-9780 (Gossage) April 15/72.  
60-60-60. WIP, WB on PF with slight incr.  
and decr. to FB in 20 min. Rec'd 186'  
heavy mud.  
HP 4746/4638, SI 4433/4239, FP 713/741.

DST #3: 8950-9170 (Gossage) April 16/72.  
Misrun - could not set packers.  
HP 4496/4463.

DST #4: 1428-1630 (Mississippian) April 17/72.  
Misrun - could not set packers.  
HP 704/713.

DST #5: 9110-9320 (Gossage) April 18/72.  
45-65-0. WAB on PF and FF. No GTS. Rec'd  
210' drilling mud.  
HP 4586/4461, SI 3917/(-), FP 431/468.

DST #6: 1500-1630 (Mississippian) April 19/72.  
45-60-45. SAB on PF, decr. to WAB on FF.  
Rec'd 895' muddy water.  
HP 714/714, SI 490-484, FP 247/451.

(b) Casing Records:

Conductor Ran 50' of 20" - 74# c/w 150 sax.  
Surface casing: Ran and set 14 JTS - 13 3/8"  
- 54.5#. Ran and set 20 JTS - 13 3/8"  
- 61# ST & C 8 RND Jap casing for a total  
of 1101.95'. Landed at 1100' K.B. c/w  
1100 sax Perma Frost cement. Clobbered  
returns with 950 sax, clean returns with  
1100 sax. Plug down 6:30 p.m. February  
20, 1972.

(c) Bit Record:

See Page 48

(d) Mud Record:

See Pages 49, 50

(e) Deviation Record:

See Page 51

5. ENGINEERING SUMMARY, CONT'D.(c) Bit Record:

Date 1972	Bit No. Type	Size	Depth		Footage	Hours		Weight	RPM	Remarks
			in	Out		On	Btm			
Feb.	13 1A	S3J	12 1/4	0	470	20.75	4-10	120		
	14 2A	S3TJ	12 1/4	470	771	16.00	8-20	120-150		
	15 3A	DSJ	12 1/4	770	937	7.75	20	100-120		
	16 4A	DSJ	12 1/4	937	1023	6.00	20	150		
	16 5A	S4TJ	12 1/4	1023	1115	7.75	10-30	90		
	17 1B	H.O.	17 1/2	0	380	22.75	5-20	120-130		Reaming 12 1/4" hole to 17 1/2"
	18 2B	H.O.	17 1/2	378	578	28.00	15-20	90-120		
	18 2B	H.O.	17 1/2	578	1100	25.00	30	50		
	23 1	XIG	8 3/4	1100	1505	31.00	30-35	100-110		Lost 1 cone, fished and recovered same
	24 2	J-44	8 3/4	1505	2289	27.25	40-45	40- 50		
	25 3	H74GJ	8 3/4	2289	2432	8.75	40-45	50- 64		
	26 4	S-88	8 3/4	2432	3383	27.25	40-50	50- 52		
	27 5	M-88	8 3/4	3383	3937	21.50	50	50- 52		
	28 6	4JS	8 3/4	3937	4493	39.75	45-12-15	40- 52		
Mar.	1 7	M-88	8 3/4	4493	5042	37.75	25-40	42- 60		
	3 8	H.W.	8 3/4	5042	5210	13.25	40	50- 52		
	4 9	M-88	8 3/4	5210	5740	32.25	40-48	40- 52		
	6 1RR	XIG	8 3/4	5740	7172	102.75	50	50		Reaming bridges 3170-3210, 3620-3680.
	11 10	J55	8 3/4	7172	7990	66.75	50	50- 52		
	14 11	X55R	8 3/4	7990	8582	592	49.00	50		
	17 12	J55	8 3/4	4711				50		Work tight hole.
	17 13	M4NJ	8 3/4				10	60		Ream bridges 5270-6088.
	19 14	M4NJ	8 3/4	8582	8637	55	8.50	45	50- 60	Ream bridges 5330-5570.
	20 15	J-55	8 3/4	8637	9224	587	54.00	50	50- 52	
	23 16	X55R	8 3/4	9224	9519	295	28.25	50	50	
	25 17	H-88	8 3/4	9519	9519					Cleaning hole, sluffed #4400.
	26 18	XIG	8 3/4	9519						Cleaning hole, reaming bridges 5272-8238.
	29 17RRH-88		8 3/4	9519	9690	171	24.75	40-50	50	Cleaning hole.
	31 19	H-88	8 3/4	9690	9880	190	48	50	50	
Apr.	1 20	X55R	8 3/4	9880	10253	373	33.25	50	50	
	2 21	PRG7XJ	8 3/4	10253	10428	175	26.75	50	50	
	5 22	H88	8 3/4	10428	10701	273	50.25	40	50	
	8 23	M88	8 3/4	10701	11050	349	53.00	50	40- 50	

T.D.

3. ENGINEERING SUMMARY, CONT'D.(d) Mud Record:

Date 1972	Depth	Viscosity	Weight	W/Loss	PH	PV	YP	AV	Gels	Remarks
Feb. 14	233	48	9.0							Mud is water, drilling 12 1/4" hole.
15	615	55	9.2							
16	920	40	9.5							
17	1115	57	10.2							
18	380	68	10.7							Reaming 12 1/4" to 17 1/2"
19	795	43	9.9							Reaming 12 1/4" to 17 1/2". Ran 13 3/8" casing.
20	1100	65	9.6							
23	1380	36	8.4							
24	1560	35	8.8	9.2	9.0					Lost 150 B/M @ 1671
25	2265	36	8.9	10.0	9.0					Lost 125 B/M @ 2286.
26	2432	38	9.0	8.0	8.0					
27	3190		9.0	9.8	8.0					
28	3684		9.0	7.8	8.5					
29	4065		9.0	9.4	8.5					
Mar. 1	4358	39	9.0	7.8	8.0					
2	4525	39	9.0	7.6	9.0	13	7			
3	4870	38	9.0	7.2	9.0	12	8			
4	5077	48	9.1							
5	5320	42	9.1	7.2	9.5	15	11			
6	5663	38	9.1	7.0	9.5	16	0			
7	5901	38	9.1	7.2	9.5	14	9			Reaming bridges.
8	6222	42	9.0	7.0	8.5	20	8			
9	6542	45	9.0	6.2	9.5	20	18			
10	6855	47	9.0	6.0	9.0	20	6			
11	7150	47	8.9	6.0	8.5	20	13			
12	7275	45	9.0	5.8	9.0	20	13			
13	7575	45	8.9	6.0	10.5	28	7			
14	7871	60	8.9	5.8	9.5	25	23			
15	8050	65	9.0	5.6	9.0	35	5			
16	8337	52	9.0	5.2	9.0	22	29	36		
17	8582	56	8.9	6.0	10.0	28	18	38		
18	8582	57	9.1			26	20	36		
19	8582	87	9.3	4.8	8.5	40	35	57		Reaming.
20	8602	95	9.4	5.8	10.0	44	39	63		
21	8670	157	9.3	5.2	8.5	65	45	87		
22	8827	100	9.4	4.8	10.0	48	44	70	8/12	
23	9165	83	9.2	5.0	9.5	35	30	50	9/14	
24	9246	68	9.2	4.4	8.5	40	28	52	4/8	
25	9504	61	9.1	5.2	9.5	34	22	45	8/12	



3. ENGINEERING SUMMARY, CONT'D.(e) Deviation Record:

<u>Depth ' </u>	<u>Dev. °</u>	<u>Depth ' </u>	<u>Dev. °</u>	<u>Depth ' </u>	<u>Dev. °</u>
90	3/4	4303	3 1/8	7045	1 1/2
200	3/8	4332	3 1/8	7110	1 1/2
264	1/4	4358	2 7/8	7140	1 1/2
385	3/4	4390	2 1/2	7200	3/4
416	3/4	4422	2	7306	1/2
552	3/4	4453	2	7369	1
677	1/4	4485	2	7400	1
760	3/4	4556	1 1/4	7431	1
770	3/4	4640	1	7455	1/2
790	3/4	4700	1	7664	1/2
823	1 1/4	4836	1 1/8	7710	1/2
854	3/4	4918	1 1/2	7741	1/2
916	7/8	4950	1 3/4	7772	1/2
947	7/8	4990	1 3/4	7830	1/2
979	3/4	5025	1 1/4	7896	1/2
1095	1	5102	1 1/2	7925	1/2
1137	1	5210	1	7958	1
1317	1/2	5281	1	7975	3/4
1380	1/2	5320	1/2	8022	1
1540	1 1/2	5420	3/4	8050	1
1630	1 1/2	5530	1/2	8110	1
1723	1 1/2	5653	1/2	8135	1
1848	1 1/2	5710	0	8196	1
1880	2	5777	0-1/2	8266	1/2
2087	1 1/2	5885	1/2	8392	1
2190	1 1/2	6016	3/4	8422	1
2289	1 1/2	6088	1	8445	1
2304	2 1/2	6150	1/2	8475	1
2398	1 1/4	6240	1/2	8508	1
2594	1 1/2	6367	1	8547	1/2
2708	1 1/2	6398	1	8580	1
2865	1	6429	1	8908	2
3000	1/2	6522	1/2	9175	2
3155	1	6640	1/2	9370	2
3217	1	6677	1/2	9400	2
3383	1 1/8	6708	1/2	9430	2
3486	1	6740	1/2	9665	2 1/4
3673	1	6770	1/2	9960	3
3890	1 1/8	6800	1/2	10250	3
3937	1 1/8	6830	1/2	10428	3 3/4
4088	1 1/8	6864	1/2	10701	2 3/4
4232	3 1/2	6895	1/2	11050	3
4263	3 3/4	6926	1		



3. ENGINEERING SUMMARY, CONT'D.

(f) Abandonment Plugs:

April 19, 1972 (Plug down 11:30 a.m.) -  
Plug #1: 11050-10860 (190'), 100 sacks.

April 19, 1972 (Plug down 12:30 p.m.) -  
Plug #2: 9770-9660 (110'), 58 sacks, felt  
plug at 9635 at 6:30 p.m. April 19, 1972.

April 19, 1972 (Plug down 7:45 p.m.) -  
Plug #3: 7400-7550 (150'), 102 sacks.

April 20, 1972 (Plug down 3:30 a.m.) -  
Plug #4: 1750-1950 (200'), 106 sacks.

April 20, 1972 (Plug down 4:30 a.m.) -  
Plug #5: 1050-1150 (100'), 104 sacks, felt  
plug at 1030 at 11:30 a.m. April 20, 1972.

(g) Lost Circulation Zones:

February 24, 1972 - 1671' - Lost 150 barrels  
mud.

February 25, 1972 - 2286' - Lost 125 barrels  
mud.

(h) Report of Blowouts:

NIL.

4. LOGGING SUMMARY:

(a) Logs:

SIDEWALL NEUTRON POROSITY - Run #1, 50' to  
11041', run April 11, 1972.

DUAL INDUCTION LATEROLOG - Run #1, 1098' to  
11036', run April 11, 1972.

FORMATION DENSITY - Run #1, 1098' to 11041',  
run April 11, 1972.

BOREHOLE COMPENSATED SONIC - Run #1, 1098' to  
11041', run April 11, 1972.

MICROLOG CALIPER - Run #1, 1098' to 11044',  
run April 11, 1972.

(b) Surveys:

VELOCITY SURVEY - Run #1, 0' to 11050', run  
April 13, 1972.

5. ANALYSES:

(a) Core Analysis:

NIL

(b) Gas Analysis:

NIL

(c) Oil Analysis:

NIL

(d) Water Analysis:

#933-2537 - April 15, 18, 19/72.  
10890-11050 (DST's 1, 2, 5, 6)

6. COMPLETION SUMMARY:

(a) Tubing Record:

NIL

(b) Perforation Record:

NIL

(c) Cementation Record:

See Section 3 (f)

(d) Acidization and Fracturing Record:

NIL

(e) Back Pressure and Production Tests:

NIL

## 7. DAILY DRILLING SUMMARY

<u>Date - 1972</u>	<u>Depth</u>	<u>Footage</u>	<u>Remarks</u>
February 3			Ran conductor pipe.
14	233	233	Drilling, spud 8:00 p.m. February 13. K.B. - Grd. 18.5'.
15	614	381	Drilling 12 1/4" hole, hole condition good.
16	920	306	Drilling.
17	1115	195	Drilling, removing 12" Hydril.
18	1115		Reaming 12 1/4" to 17 1/2".
19	1115		Reaming 12 1/4" to 17 1/2".
20	1115		Preparing to run casing.
21	1115		Waiting on cement, ran 13 3/8" casing to 1100' K.B. <b>cemented</b> with 1100 sax Perma Frost cement.
22	1115		Preparing to drill out, welded on casing b. vl and made up flare lines.
23	1380	265	Drilling 8 3/4" hole.
24	1660	280	Drilling, lost and recovered one cone.
25	2265	605	Drilling, lost 150 barrels of mud at 1671.
26	2432	167	Tripping for bit, hole condition good, lost 125 barrels of mud at 2286', holding good since.
27	3190	758	Drilling.
28	3684	494	Drilling, cleaned fill from 3772-3848.
29	4065	381	Drilling.
March 1	4358	293	Drilling.
2	4525	167	Drilling, cleaned 60' fill.
3	4870	345	Drilling.
4	5077	207	Drilling.
5	5320	243	Drilling, hit bridge 80' off bottom.
6	5663	343	Drilling.
7	5901	238	Drilling, reamed bridges 3170-3210, 3620-3680, cleaned 185' to bottom.
8	6222	321	Drilling.
9	6542	320	Drilling.
10	6855	313	Drilling.
11	7150	295	Drilling.
12	7275	125	Drilling, cleaned out 95' fill.
13	7575	300	Drilling.
14	7871	296	Drilling.
15	8050	179	Drilling, cleaned out 54' fill.
16	8337	287	Drilling.
17	8582	245	Drilling.
18	8582		Reaming tight hole and cleaning bridge from 4650 to 4900.
19	8582		Make dummy trip, clean bridges 4909-6088.
20	8602	20	Drilling, cleaned hole from 5330-5570.
21	8670	68	Drilling, reamed bridges at 7050-7179.
22	8827	157	Drilling.

## 7. DAILY DRILLING SUMMARY - CONT'D.

<u>Date - 1972</u>	<u>Depth</u>	<u>Footage</u>	<u>Remarks</u>
March 23	9165	338	Drilling.
24	9246	81	Drilling, ream 75' to bottom.
25	9504	258	Drilling.
26	9519	15	Cleaning out sluffed hole, hole bridged 4795-5050.
27	9519		Cleaning out sluffed hole, hole bridged 5050-5272.
28	9519		Cleaning out sluffed hole, hole bridged 5817-5932, 5932-6214, 6214-6890.
29	9519		Circulating and conditioning hole, hole bridged 6890-7174, 7174-7493.
30	9636	117	Drilling, cleaned out fill from 9375-9519.
31	9700	64	Drilling, cleaned out 50' fill.
April 1	9802	102	Drilling.
2	9880	78	Drilling.
3	10095	215	Drilling.
4	10253	158	Drilling.
5	10365	112	Drilling, cleaned out 21' fill.
6	10454	89	Drilling, cleaned out 18' fill.
7	10585	131	Drilling.
8	10698	113	Drilling.
9	10770	72	Drilling, cleaned out 4' to bottom.
10	10893	123	Drilling.
11	11050 TD	157	Drilling, circulate and condition hole to log.
12	11050		Logging.
13	11050		Logging.
14	11050		Circulating and conditioning hole to test.
15	11050		Testing - DST #1: 10890-11050.
16	11050		Pulling out with test tool, ran DST #2: 9620-9780.
17	11050		Pulling test tool, ran DST #3: 8950-9170.
18	11050		Testing - DST #5: 9110-9320, Ran DST #4: 1428-1630.
19	11050		Preparing to run plugs. Ran DST #6: 1500-1630.
20	11050		Laying down drill pipe. Ran plugs 1-5. Cut off casing bowl, welded on plate, attached well sign.
21	11050		Tearing out rig. Rig released 7:00 p.m. April 20, 1972.