Natural Resources and Environment

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WELL SUMMARY

SNAPPER-1 (W519)

1 Folio No.	2 Referred to	3 Date	4 Clearing Officer's Initials	1 Folio No.	2 Referred to	3 Date	4 Clearing Officer's Initials

SNAPPER-1 (W519)

Well Summary Report

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ATTACHMENT

CORE PHOTOGRAPH REPORT PE905020

519

NEW FIELD DISCOVERY
AND
WELL COMPLETION REPORT

SNAPPER 1

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ILLUSTRATIONS

WELL STATISTICS - SNAPPER 1

Purpose of Well: The Snapper 1 well was drilled to evaluate the hydrocarbon potential of sandstones of the Latrobe Delta Complex located on the crest of a large closed topographic and anticlinal anomaly.

Location:
Latitude 38° 12' 03" S
Longitude 148° 00' 50" E
Shot Point 2896, Line EC 121
Zone 7
Gippsland Basin, Victoria, Aus.

Elevation: Mean Sea Level, Rotary table above Sea Level

Discoverer II	Ocean Digger
31'	99

Water Depth: 180'

Spudded: 9 May, 1968

Completed: 7 January, 1969

Total Depth: 12,320'

Well Status: Plugged and suspended as a discovery oil and gas well.

Casing:
30" at 327'
20" at 1682'
13 3/8" at 4775'
9 5/8" at 9316'
7 5/8" liner at 9177' to 11,523'

Perforations: 9295-9325' Schlumberger depth, 9225-9255' Welex depth
30' 4 SPF
4577-4580' (Schlumberger depth)

Plugs:

No. 1	11,950-11,672	65 sacks cement
No. 2	11,668-11,000	160 sacks cement
No. 3	Retainer set at 9945,	110 sacks cement below and 40 sacks cement above retainer
No. 4	9300-8800	155 sacks cement
No. 5	8700-8300	140 sacks cement
No. 6	7941-7541	140 sacks cement
No. 7	7410-7210	75 sacks cement
No. 8	6590-6260	116 sacks cement
No. 9	5900-5700	75 sacks cement
No.10	5400-5025	140 sacks cement

Cores: Thirty-one conventional cores were cut in the Latrobe Delta Complex.

Core No.	Interval	Cut	Rec.
1	4060-4090	30'	8"
2	4090-4115	25'	18'
3	4115-4145	30'	21'
4	4135-4160	25'	22'
5	4160-4186	26'	9'
6	4186-4228	42'	6"
7	4228-4258	30'	27'
8	4258-4288	30'	21'
9	4288-4314	30'	21'
10	4314-4344	30'	24'
11	4344-4368	24'	21'
12	4368-4399	31'	31'
13	4399-4427	28'	6"
14	4427-4437	10'	0
15	4445-4474	29'	23'
16	4474-4502	28'	3'
17	4502-4546	44'	22'
18	4546-4577	31'	15'
19	4577-4607	30'	14'
20	4607-4642	35'	24'
21	4642-4676	34'	15'
22	5884-5915	31'	31'
23	6746-6755	9'	9'
24	7448-7477	29'	26'
25	8467-8497	30'	30'
26	9241-9257	16'	16'
27	9259-9290	31'	31'
28	9882-9903	21'	21'
29	10,389-10,415	26'	25'
30	10,485-10,513	28'	28'
31	10,979-11,009	30'	30'

A total of 365 sidewall cores were shot in the interval 3390-12,285 with 265 recovered.

Mud Logs: Snapper 1 was logged by Baroid over the interval 1800-11,130 (Welex depth K.B. 31') and by Exploration Logging from 11,200-12,320 (Schlumberger depth K.B. 99').

ELECTRIC LOGS

Welex	Induction Electric	327-10,855
	Formation Density	1682-4823 & 9314-10,860

	Gamma Ray-Neutron	3800-10,860
	FORXO Log (MLL)	4650-9367
	Acoustic Velocity-Caliper	327-10,858
	Dip Meter	327-10,855
	Velocity Survey	4805
Schlumberger	Induction Electric	9384-12,318
	Formation Density - Gamma Ray	9384-12,318
	Borehole Compensated Sonic	10,500-12,319
	Gamma Ray-Neutron	3900-12,318
	Cement Bond Log	3900-11,524
	Dip Meter	9384-11,518

WIRELINE FORMATION TESTS

Welex Depths

Test No. 1,	4547 feet,	Misrun, choke valve plugged.
Test No. 2,	4547 feet,	Recovered 40.5 cubic feet gas, 95 cc condensate 150 cc mud (gravity 67° API). Sampling pressure 1875 psi, sampling time 19 min., shut-in pressure 1875 psi, shut-in time 2 min., hydrostatic pressure 2750 psi.
Test No. 3,	4568 feet,	Recovered 4220 cc oil (gravity 46.3° API, pour point 67° F), 21.5 cubic feet gas, 350 cc mud, sampling pressure 1900 psi, sampling time 18 min, shut-in pressure 1900 psi, shut-in time 3 min, hydrostatic pressure 2800 psi.
Test No. 4,	4596 feet,	Recovered 9700 cc water plus a scum of oil, Rrf 1.32 at 58°, sampling pressure 1900 psi, sampling time 18 min, shut-in pressure 1975 psi, shut-in time 2 min, hydrostatic pressure 2700 psi.
Test No. 5,	4205 feet,	Recovered 16.6 cubic feet gas, 185 cc condensate and 185 cc mud, sampling pressure 1820 psi, sampling time 18 min, shut-in pressure 1875 psi, shut-in time 2 min, hydrostatic pressure 3000 psi.
Test No. 6,	4590 feet,	Misrun, left tool in hole.
Test No. 7,	9252 feet,	Recovered 300 cc mud, Rrf 1.28 at 62° F, sampling pressure 0, sampling time 20 min, shut-in pressure 0 shut-in time 1 min, hydrostatic pressure 5400 psi.
Test No. 8,	9146 feet,	Misrun, packer failure.
Test No. 9,	7912 feet,	Recovered 60 cubic feet gas, 150 cc condensate (57° gravity at 68° F), GOR 63,400, 1410 cc mud and water, 2200 ppm NaCl equiv., sampling pressure 2650 psi, sampling time 13 min, shut-in pressure 3510 psi, shut-in time 2 min, hydrostatic pressure 4570 psi.
Test No. 10,	9196 feet,	Misrun, seal failure after 28 min, recovered 0.2 cubic feet gas, 10,000 cc filtrate, 4500 cc mud, thin oil scum.

Test No. 11,	8850 feet,	Recovered 0.2 cubic feet gas, 10,000 cc filtrate and mud, thin scum of oil, Rrf 1.22 at 70° F, 4800 ppm NaCl equiv., sampling pressure 700 psi, sampling time 15 min, shut-in pressure 3785 psi, shut-in time 1 min, hydrostatic pressure 5180 psi.
Test No. 12,	5684 feet,	Recovered 54.7 cubic feet gas, 45 cc condensate (gravity 50.5° at 76° F), GOR 182,600, 10 cc mud, sampling pressure 2470 psi, sampling time 10 min, shut-in pressure 2470 psi, shut-in time 1 min, hydrostatic pressure 3300 psi.
Test No. 13,	9254 feet,	Misrun, hydraulic seal failure.
Test No. 14,	7804 feet,	Misrun, hydraulic seal failure.
Test No. 15,	7809 feet,	Misrun, hydraulic seal failure.
Test No. 16,	7806 feet,	Recovered 10,000 cc mud filtrate, Rrf 1.42 at 69° F, 4100 ppm NaCl equiv., sampling pressure 1350 psi, sampling time 15 min, shut-in pressure 3950 psi, shut-in time 1 min, hydrostatic pressure 4500 psi.
Test No. 17,	7444 feet,	Misrun, packer seal failure.
Test No. 18,	5714 feet,	Recovered 8800 cc mud filtrate, Rrf 1.56 at 78° F, 3700 ppm NaCl equiv., sampling pressure 2200 psi, sampling time 4 min, shut-in pressure 0 psi, lost pad seal, hydrostatic pressure 3300 psi.
Test No. 19,	5705 feet,	Misrun, lost pad seal.
Test No. 20,	5708 feet,	Recovered 8500 cc mud filtrate, 3500 ppm NaCl equiv., trace of oil scum, sampling pressure 2400 psi, sampling time 21 min, shut-in pressure 2500 psi, shut-in time 3 min, hydrostatic pressure 3290 psi.
Test No. 21,	6655 feet,	Misrun.
Test No. 22,	9253 feet,	Recovered 1500 cc mud filtrate, Rrf 1.15 at 68°, 3300 ppm NaCl equiv., sampling pressure 100 psi, sampling time 20 min, shut-in pressure 400 psi, shut-in time 3 min, hydrostatic pressure 5350 psi.
Test No. 23,	8344 feet,	Misrun.
Test No. 24,	8383 feet,	Misrun.
Test No. 25	10,082 feet,	Misrun, chamber would not open.
Test No. 26,	10,082 feet,	Misrun, "0" rig failure, short in electric circuit.
Test No. 27,	10,082 feet,	Misrun, packer seal failure.
Test No. 28,	9506 feet,	Misrun, packer seal failure.
Test No. 29,	9400 feet,	Flow line plugged with sand, no pressures recorded. Recovered 35 cc mud, 2500 ppm NaCl equiv., 5 cc oil (questionable gravity 24.5° API).

Schlumberger Depths

Test No. 30,	11,428 feet,	Misrun, lost packer seal.
Test No. 31,	11,244 feet,	Misrun, lost packer seal.

Test No. 32,	11,522 feet,	Misrun, circuits shorted by mud.
Test No. 33,	11,485 feet,	Misrun, packer failed to seal.
Test No. 34,	11,439 feet,	Misrun, packer failed to seal.
Test No. 35,	11,490 feet,	Misrun, mechanical failure.
Test No. 36,	11,490 feet,	Recovered 1.5 cubic feet gas, 5000 cc mud and trace of sand. Rrf 0.90 at 78° F, 6700 ppm NaCl equiv., flowing pressure 0 psi, tool open 21.5 min, final shut-in pressure 6880 psi, shut-in time 15 min, hydrostatic pressure 8520 psi.
Test No. 37,	11,382 feet,	Recovered 308 cubic feet gas, 33,000 cc mud with a trace of condensate, flowing pressure 6550 psi, tool open 76.5 min, final shut-in pressure 6550 psi, shut-in time 25.5 min, hydrostatic pressure 8520 psi, surf pressure 2700 psi.
Test No. 38,	11,297 feet,	Recovered 15 cubic feet gas, 29,000 cc mud with trace of condensate, flowing pressure 580 psi, tool open 62.5 min, final shut-in pressure 2500 psi, shut-in time 23.8 min, hydrostatic pressure 8570 psi, surface pressure 200 psi.
Test No. 39,	11,144 feet,	Recovered 17.3 cubic feet gas, 14,000 cc water, Rrf .32 at 71° F, NaCl equiv. 20,000 ppm, 5000 cc mud, trace of condensate, flowing pressure 200 psi, tool open 50.5 min, final shut-in pressure 3950 psi, shut-in time 35 min, hydrostatic pressure 8270 psi, surface pressure 200 psi.
Test No. 40,	10,388 feet,	Recovered 13.4 cubic feet gas, and 19,000 cc mud, with trace of condensate, Rrf .81 at 74° F, NaCl equiv. 7000 ppm, flowing pressure 2840 psi, tool open 21.5 min, final shut-in pressure 4670 psi, shut-in time 7 min, hydrostatic pressure 7330 psi, surface pressure 1600 psi.
Test No. 41,	10,154 feet,	Recovered 1.1 cubic feet gas and 50 cc water, Rrf 1.07 at 72° F, NaCl equiv. 3400 ppm, flowing pressure 200 psi, tool open 36 min, final shut-in pressure 300 psi, shut-in time 18.3 min, hydrostatic pressure 7700 psi.
Test No. 42,	10,036 feet,	Recovered 0.4 cubic feet gas and 3000 cc of mud, flowing pressure 100 psi, tool open 62.5 min, final shut-in pressure 4420 psi, tool shut-in time 29 min, hydrostatic pressure 7380 psi.
Test No. 43,	9984 feet,	Recovered 2000 cc mud, flowing pressure 200 psi, tool open 52.5 min, final shut-in pressure 200 psi, shut-in time 17.5 min, hydrostatic pressure 7400 psi.
Test No. 44,	9054 feet,	Recovered 6.4 cubic feet gas, 42,000 cc mud, flowing pressure 200 psi, tool open 16.5 min, final shut-in pressure 500 psi, shut-in time 9.5 min, hydrostatic pressure 6780 psi, surface pressure 100 psi.
Test No. 45,	9104 feet,	Recovered 12 cubic feet gas, 25,000 cc mud, flowing pressure 320 psi, tool open 19 min, final shut-in pressure 2620 psi, final shut-in time 14 min, hydrostatic pressure 6740 psi, surface pressure 100 psi.

Test No. 46,	8920 feet,	Recovered 1500 cc mud and water, flowing pressure 220 psi, tool open 23 min, final shut-in pressure 4200 psi, final shut-in time 14 min, hydrostatic pressure 6730 psi.
Test No. 47,	8686 feet,	Recovered 1.7 cubic feet gas, 3000 cc mud, final shut-in pressure 3900 psi, tool shut-in 2 min, hydrostatic pressure 6500 psi.
Test No. 48,	8499 feet,	Misrun, flow line plugged, final shut-in pressure 3750 psi, shut-in time 3 min.
Test No. 49,	7876 feet,	Misrun, packer failed to set.
Test No. 50,	7876 feet,	Recovered 166 cubic feet gas, 15,000 cc oil, gravity 46° API, pour point 71° F, GOR 710, 22,000 cc water, Rrf 1.03 at 78° F, NaCl equiv. 5200 ppm, flowing pressure 3200 psi, tool open 2.1 min, final shut-in pressure 3460 psi, final shut-in time 5.4 min, hydrostatic pressure 5710 psi, surface pressure 1800 psi.
Test No. 51,	7683 feet,	Recovered 130 cubic feet gas, 35,750 cc water with a trace of condensate, Rrf 1.05 at 78° F, NaCl equiv. 5250 ppm, flowing pressure 3400 psi, tool open 8.6 min, final shut-in pressure 3400 psi, final shut-in time 4.9 min, hydrostatic pressure 5800 psi, surface pressure 1800 psi.
Test No. 52,	7303 feet,	Recovered 259 cubic feet gas, 200 cc condensate, and 5500 cc mud, Rrf 1.76 at 70° F, NaCl equiv. 3600 ppm, flowing pressure 3130 psi, tool open 0.3 min, final shut-in pressure 3130 psi, final shut-in time 4.7 min, hydrostatic pressure 5310 psi, surface pressure 1800 psi.
Test No. 53,	6274 feet,	Recovered 101.3 cubic feet gas, 70,000 cc gas cut oil, gravity 39.5° API, pour point 77° F, 7000 cc mud, flowing pressure 2770 psi, tool open 1.8 min, final shut-in pressure 2770 psi, final shut-in time 2.7 min, hydrostatic pressure 4840 psi, surface pressure 1300 psi.
Test No. 54,	5775 feet,	Recovered 12 cubic feet gas, 62,600 cc water with a scum of oil, Rrf 0.54 at 68° F, NaCl equiv. 11,700 ppm, flowing pressure 500 psi, tool open 0.9 min, final shut-in pressure 2510 psi, final shut-in time 3.6 min, hydrostatic pressure 4120 psi, surface pressure 900 psi.
Test No. 55,	5355 feet,	Recovered 2.8 cubic feet gas, 66,250 cc water with a scum of oil, Rrf .89 at 74° F, NaCl equiv. 6700 ppm, flowing pressure 1000 psi, tool open 0.5 min, final shut-in pressure 2360 psi, final shut-in time 4.5 min, hydrostatic pressure 4020 psi, surface pressure 900 psi.
Test No. 56,	8501 feet,	Recovered 12.5 cubic feet gas, 61,250 cc water with a scum of oil, Rrf 0.83 at 78° F, NaCl equiv. 6400 ppm, flowing pressure 3500 psi, tool open 28 min, final shut-in pressure 3500 psi, shut-in time 3.5 min, hydrostatic pressure 6400 psi, surface pressure 900 psi.

Test No. 57,	7903 feet,	Recovered 24,500 cc water with a trace of oil and some gas, Rrf 1.25 at 68° F, NaCl equiv. 4800 ppm flowing pressure 3330 psi, tool open 2.4 min, final shut-in pressure 3330 psi, shut-in time 1.7 min, hydrostatic pressure 5650 psi, surface pressure 400 psi.
Test No. 58,	6552 feet,	Recovered gas (no meter) and 18,000 cc gas and oil cut mud, Rrf 1.98 at 76° F, NaCl equiv. 2400 ppm, flowing pressure 2980 psi, tool open 0.7 min, final shut-in pressure 2980 psi, final shut-in time 0.8 min, hydrostatic pressure 4960 psi, surface pressure 1050 psi.
Test No. 59,	6286 feet,	Recovered gas (no meter) and 21,000 cc of gas cut mud with trace of oil, Rrf 0.92 at 76° F, NaCl equiv. 6000 ppm, flowing pressure 2660 psi, tool open 1 min, final shut-in pressure 2660 psi, final shut-in time 1.4 min, hydrostatic pressure 4670 psi, surface pressure 400 psi.
Test No. 60,	5894 feet,	Recovered gas (no meter), 4000 cc water and a trace of condensate, Rrf 1.17 at 79° F, NaCl equiv. 4500 ppm, flowing pressure 2700 psi, tool open 0.3 min, final shut-in pressure 2700 psi, shut-in time 27 min, hydrostatic pressure 4400 psi, surface pressure 2000 psi.

PRODUCTION TESTS

Production Test - 1

The interval 9295-9325 (Schlumberger) = 9225-9255 (Welex) was tested through perforations (4 SPF). On a 12 hour test the well flowed at the rate of 1099 Mcf gas plus 5 barrels of oil per day through a ½" choke with a tubing pressure of 350 psi. Gravity of the oil was 38.8° API, and the pour point was 85° F. The GOR was 219,800 and a bottom hole shut-in pressure of 3927 psi.

Production Test - 2

A production test of casing perforations 4577-4580 (Schlumberger) in the upper Latrobe gas reservoir flowed at a daily rate of 4.8 mmcf gas and 61 barrels of condensate on a 3/8" choke. Gravity of the condensate was 61° API with a tubing pressure of 1600 psi. Bottom hole shut-in pressure was 2014 psi, and separator pressure was 710 psi.

HYDROCARBONS

A thick hydrocarbon column was encountered at the top of the Latrobe Delta Complex, which consists of a thick gas column and a thin oil column. The top of the Latrobe was encountered at 3982 (-3951) and was accompanied by a good show of gas on the mud-gas analyser. Coring was commenced at 4060 and was almost continuous through the oil-water contact. Core recovery was poor because of the friable nature of the sands. Summary of the analysis of cores, logs and wireline formation tests are as follows:

TOP LAT 3982

Top Latrobe Delta Complex		3982 (-3951)
Gas-oil contact		4563 (-4532)
Gross gas column	581'	
Net effective gas sand	368' (64%)	
Average Porosity (logs and cores)	30%	

Oil-water contact		4592 (-4561)
Gross oil column	29'	
Net effective oil sand	20' (70%)	
Average Porosity (logs and cores)	30%	

Area at oil-water contact 25 sq.miles.

Oil recovered on tests was 44.8° API, with a pour point of 70° F. Wax content was 11.25% and the sulphur content was .40%. Properties of the gas are being determined.

This structure is complicated by faulting and these faults might affect the gas-oil and possibly the oil-water contacts.

Following is a tabulation of the numerous oil and gas reservoirs and sands having shows of hydrocarbons, which were encountered below the Upper Latrobe pay section in Snapper 1. This tabulation takes into consideration all of the test data available on the respective zones.

The borehole was badly washed out during drilling operations and wireline test operations in the open hole were for the most part unsuccessful. Fortunately, 9 5/8" casing was set at 9384' (Schlumberger) and a 7 5/8" liner from 9177 - 11,523'. Wireline and production testing through the casing and liner did yield valuable information concerning the oil or gas potential of numerous zones.

The possibility of deep invasion and formation damage must be given careful consideration in interpreting test results. Large amounts of mud as well as gas were recovered from various zones and the possibility exists that oil may well be present in some of the sands classified as gas productive.

In an effort to "classify" the various zones of interest the sands have been placed in three categories:

Proved Productive - sands considered to be productive of oil or gas from wireline or production testing data.

Probably Productive - sands considered productive on the basis of electrical logs, mud logs, sidewall and/or conventional cores.

Show Zones - sands which are indicated to have shows of hydrocarbons, but are considered to be possibly impermeable or water wet.

All of the sands are listed from the deepest to the shallowest depths. A summary is then included of only the known proved productive and probable productive zones. The porosities shown were computed by EPRCo and Esso Australia. These porosities are weighted averages of only the net effective pay. Sands having a porosity of less than 10% were omitted from the "Net Pay" calculations.

Overall Sand Interval	Effective Net Gas	Effective Net Oil	Weighted Ave. Porosity (%)	Remarks
Schlumberger Depths				
11,470-11,502		22' Probable-Tight	16.6	Oil show in sidewal cores. Overpressured FIT No. 36
11,434-11,442		5' Probable-Tight	18.5	Oil show in side-wall cores

	Net gas	Net oil		
11,330-11,389	55' Proved		16.6	Overpressured; FIT No. 37
11,278-11,310	14' Proved-Tight		14.2	FIT No. 38
11,248-11 255	5' Probable-Tight		18.5	Mud Log Show
11,212-11,222	10' Probable-Tight		15.1	Mud Log Show
10,930-10,954	? Show		-	Mud Log Show
10,840-10,850	? Show		-	Mud Log Show
10,730-10,745	4' Show		11.5	Mud Log Show
10,664-10,675	6' Show		13.5	Mud Log Show
10,531-10,555	7' Show		13.9	Mud Log Show
10,428-10,471	10' + Probable		13.5	Mud Log Show
10,380-10,403	3' Proved		18.5	FIT No. 40
10,132-10,160	7' Show-Tight		14.6	FIT No. 41
10,030-10,041	5' Show		12.4	Impermeable or possible water FIT No. 42
9937-9988	8' Show		19.0	Impermeable or possible water FIT No. 43
9778-9800	3' Probable		22.5	Electrical log and mud log sho
9460-9522		38' Probable	19.0	Possible low permeability. FIT No. 29 (Welex)
9406-9432	16' Probable		21.2	Possible low permeability
<u>Welex Depths</u>				
9269-9304	15' Probable-Tight		13.8	Possible low permeability
9172-9259	87' Proved-Tight		16.7	Production Tes trace of oil - Low permeabili or formation damage. Oil sa ration in core
9143-9150	7' Probable		24.0	Possible low permeability.
9026-9039	8' Proved-Tight		14.9	Possible low permeability; FIT No. 45

gas oil

8965-9006	19' Proved-Tight		20.7	Possible low permeability; FIT No. 44
8834-8934	80' Probable-Tight		16.0	Possible low permeability; FIT No. 46
8783-8816	10' Show		17.0	Mud Log Show
8684-8700	12' Show		20.7	Mud Log Show
8662-8771	9' Show		20.0±	Mud Log Show
8612-8627	6' Proved		22.0	Good pressures. FIT No. 47
8573-8590	14' Probable-Tight		15.0	Possible low permeabilit
8529-8536	7' Show		19.0±	Mud Log Show
8510-8518	6' Show		19.0±	Mud Log Show
8441-8455	8' Probable		19.8	Possible low permeability
8421-8432	11' Proved		19.2	Possible low permeability; FIT No. 56
8382-8389	7' Show		20.9	Possible low permeability
7900-7920	20' Proved		24.5	FIT No. 9 (Welex)
7822-7842		19' Probable	20.0	FIT No. 57
7795-7816		16' Proved	21.7	FIT No. 50
7604-7620	14' Proved		22.1	FIT No. 51
7436-7450		3' Show	22.0	Sidewall cores
7218-7242	12' Proved		22.5	Gas/water at 7238' FIT No. 52
7102-7144	4' Show		15.2	Probably low permeability
6474-6520		14' Probable	23.3	FIT No. 58
6193-6222		16' Proved	23.2	FIT No. 53 O/W @ 6212
5883-5922	10' Probable		26.0	Core; G/W @ 5894
5804-5858	21' Proved		26.0	G/W @ 5844; FIT No. 60
5774-5794	7' Probable		30.0	Note: Sands fr 5774-5858 almo massive
5670-5730	25' Proved		27.0	G/W @ 5700'; FIT No. 13 (Welex) and FIT No. 54

Summary.

Interval	Proved Prod. Net Gas	Oil
11,330-11,389	55	
11,278-11,310	14	
10,380-10,403	3	
9172-9259	87 (Prod. Test)	
9026-9039	8	
8965-9006	19	
8612-8627	6	
8421-8432	11	
7900-7920	20	
7795-7816		16
7604-7620	14	
7218-7242	12	
6193-6222		16
5804-5858	21	
5670-5730	25	
14 Zone:	295'	32'
	Probable Prod.	
11,470-11,502		22
11,434-11,442		5
11,248-11,255	5	
11,212-11,222	10	
10,428-10,471	10+	
9778-9800	3	
9460-9522		38
9406-9432	16	
9269-9304	15	
9143-9150	7	
8834-8934	80	
8573-8590	14	
8441-8455	8	
7822-7842		19
6474-6520		14
5883-5922	10	
5774-5794	7	
	185'	98'

STRATIGRAPHY

Formation	Top	Thickness
Gippsland Formation	-	+3700'
Lakes Entrance Formation	Missing	
Latrobe Delta Complex	3982 (-3951)	+8338'

Miocene

Gippsland Formation: The upper 1800 feet of the Gippsland formation is interpreted to contain interbedded skeletal limestone, micritic limestone and marls. No samples were caught over this interval. From 1800 to 3000 the section consist of mudstone with an occasional very thin micritic limestone. Below 3000 feet the section consists entirely of mudstone.

Mudstone

Light grey to brown, calcareous, silty, soft, with occasional foram and skeletal debris.

Micritic limestone

Light grey to brown, very argillaceous soft to firm, with minor skeletal debris.

Oligocene

Lakes Entrance Formation: The Oligocene, Lakes Entrance formation is missing over the Snapper structure due to non deposition. The Lakes Entrance thins by onlap around this structural feature, which was apparently not covered until early Miocene time indicating structural growth or topography during Oligocene time.

Eocene, Paleocene, Upper Cretaceous Latrobe Delta Complex

Snapper 1 penetrated 8338' of Latrobe Delta Complex sediments between 3982 and a total depth of 12,320'. This section consisted almost entirely of non-marine sediments which included sandstone, shale, coal and siltstone.

From the top of the Latrobe to approximately 8700' the section contained a high percentage of sandstones with good to excellent porosity and permeability. The sands are primarily braided stream and point bar (porosity 20-30%, permeability 100-1000 md.) with some crevasse shaly sandstones. The crevasse shaly sandstones have good porosity. The permeability, however, varies from 50 md to nil because of the high content of clay matrix material (10-25%). In general, the sandstones of the braided stream and point bar environments are described as: light grey to brown, medium to coarse grained, well to poorly sorted, sub-rounded to sub-angular, commonly friable to poorly cemented with good to excellent porosity and permeability. The crevasse shaly sandstones are in general light grey, very fine to medium grained, sub-angular to sub-rounded, poorly sorted, with abundant clay matrix material. Also included in this part of the section is shale and coal. The shales are medium grey to brown grey, carbonaceous and soft. The coal is black to brown with a dull earthy to vitreous luster and sub-conchoidal fracture.

From 8700' to a total depth of 12,320' the section becomes less sandy and crevasse shaly sandstones become the predominant coarse clastic material, though braided stream and point bar sandstone do occur. The remainder of the section includes shales, siltstones and coals. Sandstones in this part of the section are similar to those described above except that they are not quite so coarse, and the braided stream and point bar sandstones have a fairly high clay matrix content, up to 25%, which greatly reduces the permeability.

Maximum porosity in this zone is about 20% and is as low 10%; again generally decreasing with depth. Of special concern is the high clay content of the sandstones which are believed to have been deposited in a high energy environment. If this interpretation is correct, the clays may be secondary. Currently, a petrographic and X-Ray study of these sandstones is being made to determine the origin of the clays.

The shales and coals present in this part of the section are similar to those described above, but becoming increasingly hard with depth.

Zonation

Foraminiferal zonation by David J. Taylor.

Age	Zone	Top (drilled depths)
Upper Miocene	A, B, C	Prob. Present. No samples above 1800'. No diagnostic forams between 1800-2400.
Middle Miocene	D	2400
	E	2900
Lower Miocene	F	3570
	G	3900
	H	Missing
Oligocene	I	Missing
	J	Missing

Palynology by P.R. Evans.

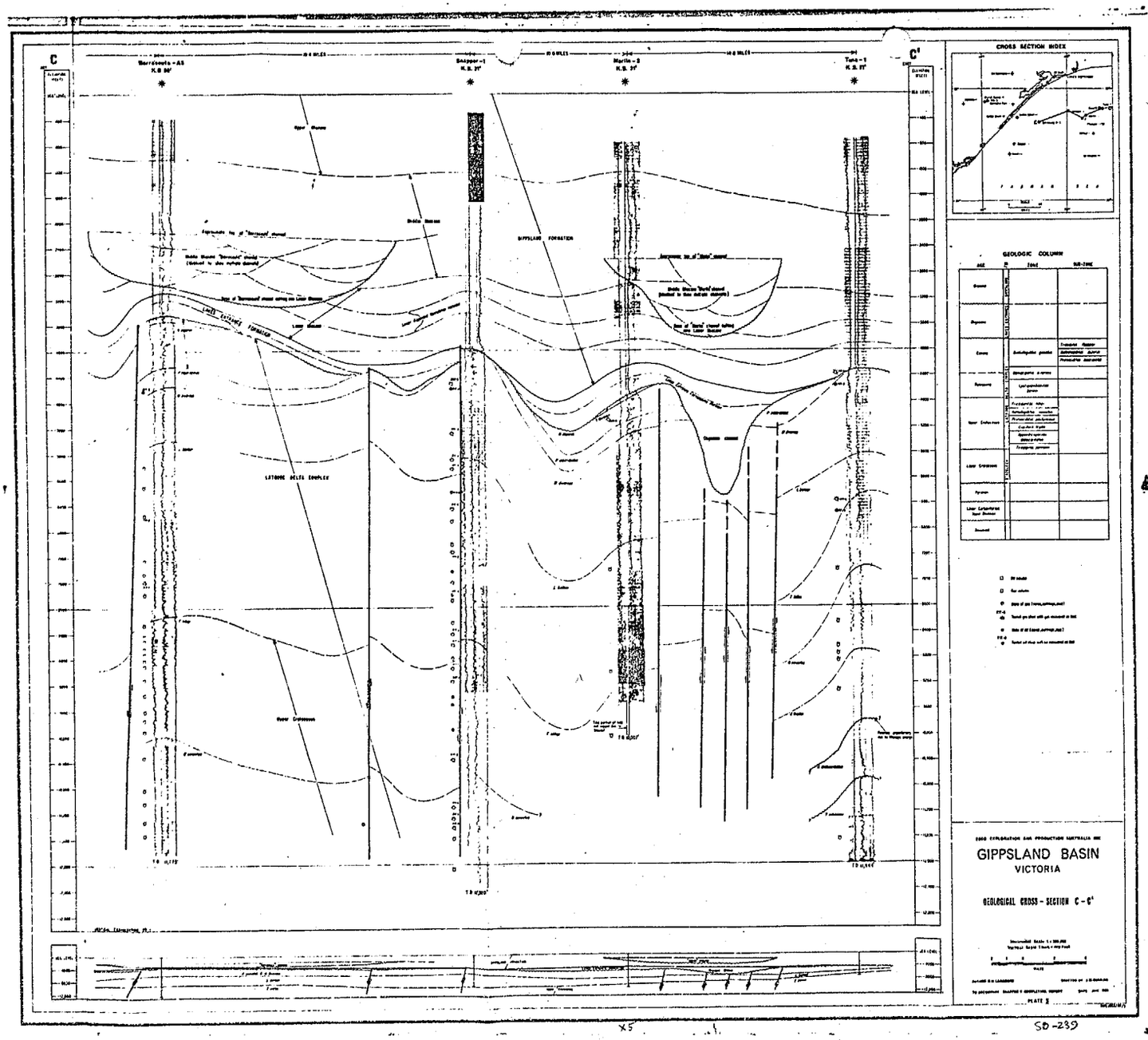
Paleocene-Eocene	M. diversus	3982
Paleocene	L. balmei	5623
Upper Cretaceous	T. lilliei	8492
	N. senectus	9900

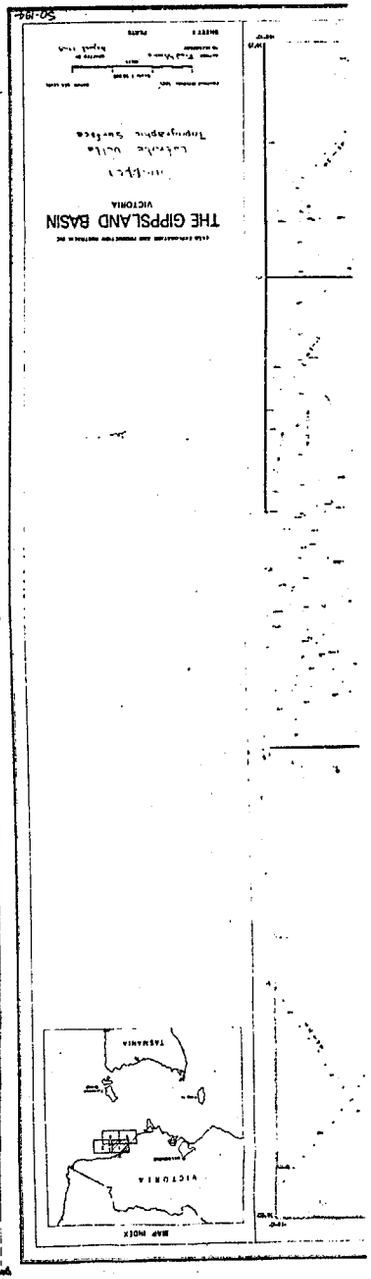
GEOLOGY

Snapper 1 is located on the Barracouta-Snapper anticlinal trend. This trend strikes ENE-WSW and is about 30 miles long. The regional map on the Latrobe Delta Topographic Surface reveals a large local high on each end of this structural feature. A third, smaller anticlinal culmination is present between Snapper and Barracouta.

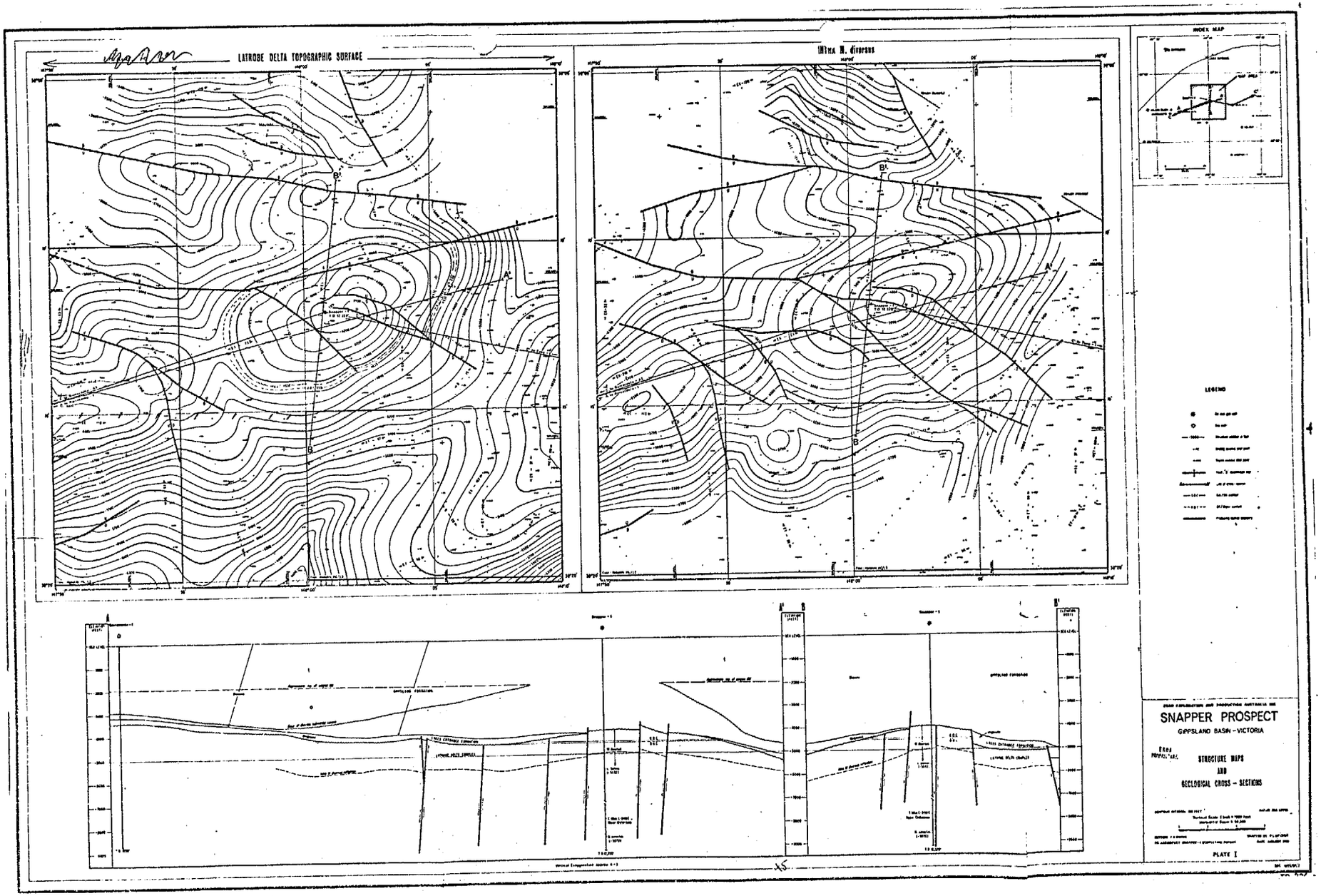
Snapper 1 is located near the crest of the easternmost culmination approximately 21 miles east of Barracouta (Plate 1). A large anticline is mapped on the Latrobe topographic surface trending ENE-WSW with a normal, down to the north fault which is north of and trends parallel with the anticlinal axis. Displacement on this fault varies from 550 to 750' in the vicinity of the Snapper field. This fault forms the northern seal for hydrocarbons at this horizon with the Latrobe sand being in juxtaposition with Oligocene Lakes Entrance mudstones. The Oligocene is missing over the crest of the structure. A series of normal faults trending northwest-southeast, and down to the southwest divide this anticline into at least three segments. Displacement on these faults is small, approximately 100. In addition, the faults do not interrupt the Latrobe Delta topographic surface everywhere, but become more pronounced with depth. From experience with similar faults associated with a thin oil column at Marlin it is quite likely these faults will have a marked affect on the oil column.

Structure mapped on an intra-Latrobe reflection (Plate 1) generally conforms with the structure at the Latrobe Delta topographic surface. Seismic data below the mapped intra-Latrobe horizon is generally poor. North dip from the anticlinal axis affords closure even if the fault zone is not sealed.

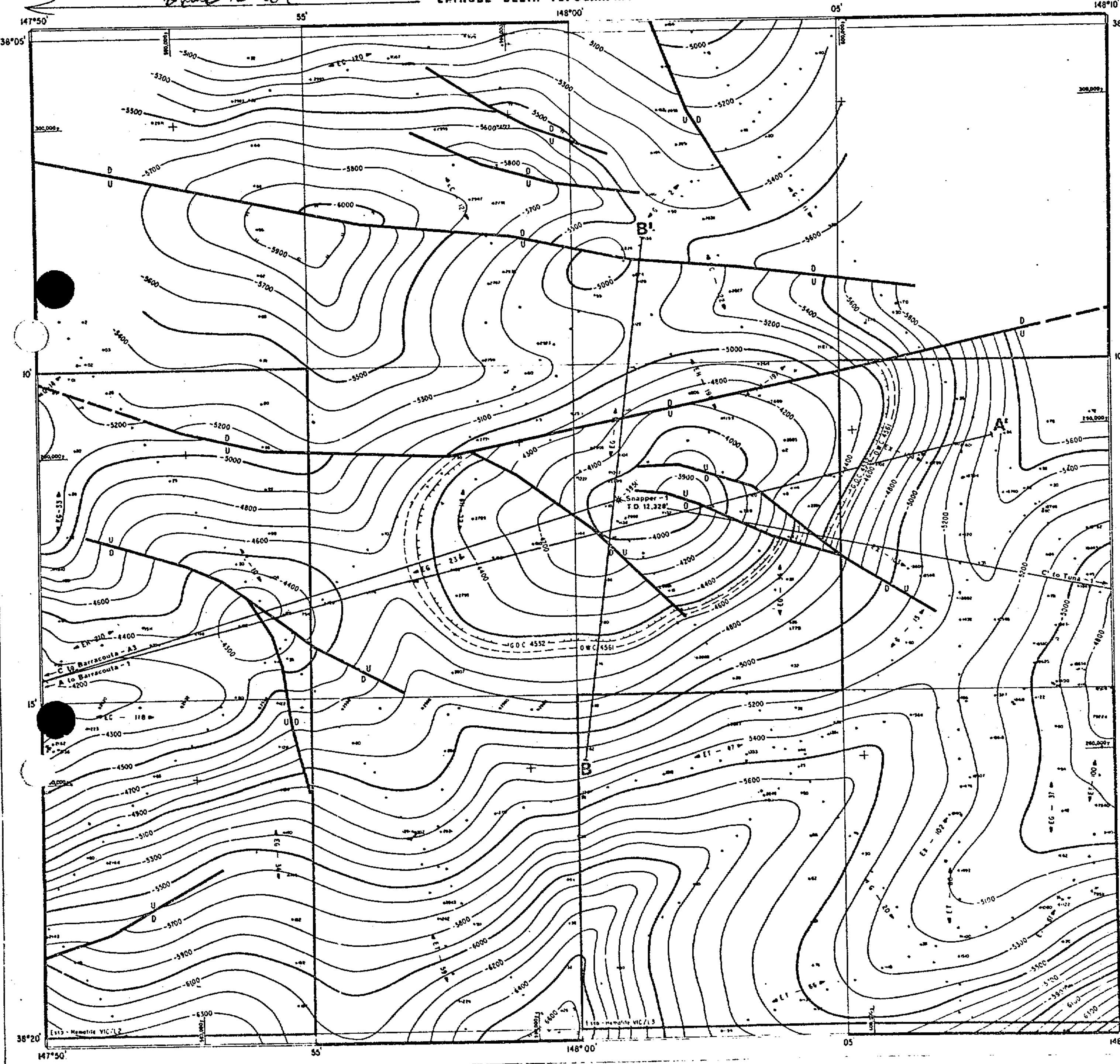

C
C'
Barracouta - A5
Snapper - 1
Marlin - 3
Tuna - 1
Upper Latrobe
Middle Latrobe
Lower Latrobe
GIPPSLAND FORMATION
LATROBE DELTA COMPLEX
Upper Cretaceous
CROSS SECTION INDEX
GEOLOGIC COLUMN
GIPPSLAND BASIN
VICTORIA
GEOLOGICAL CROSS - SECTION C - C'
PLATE 3

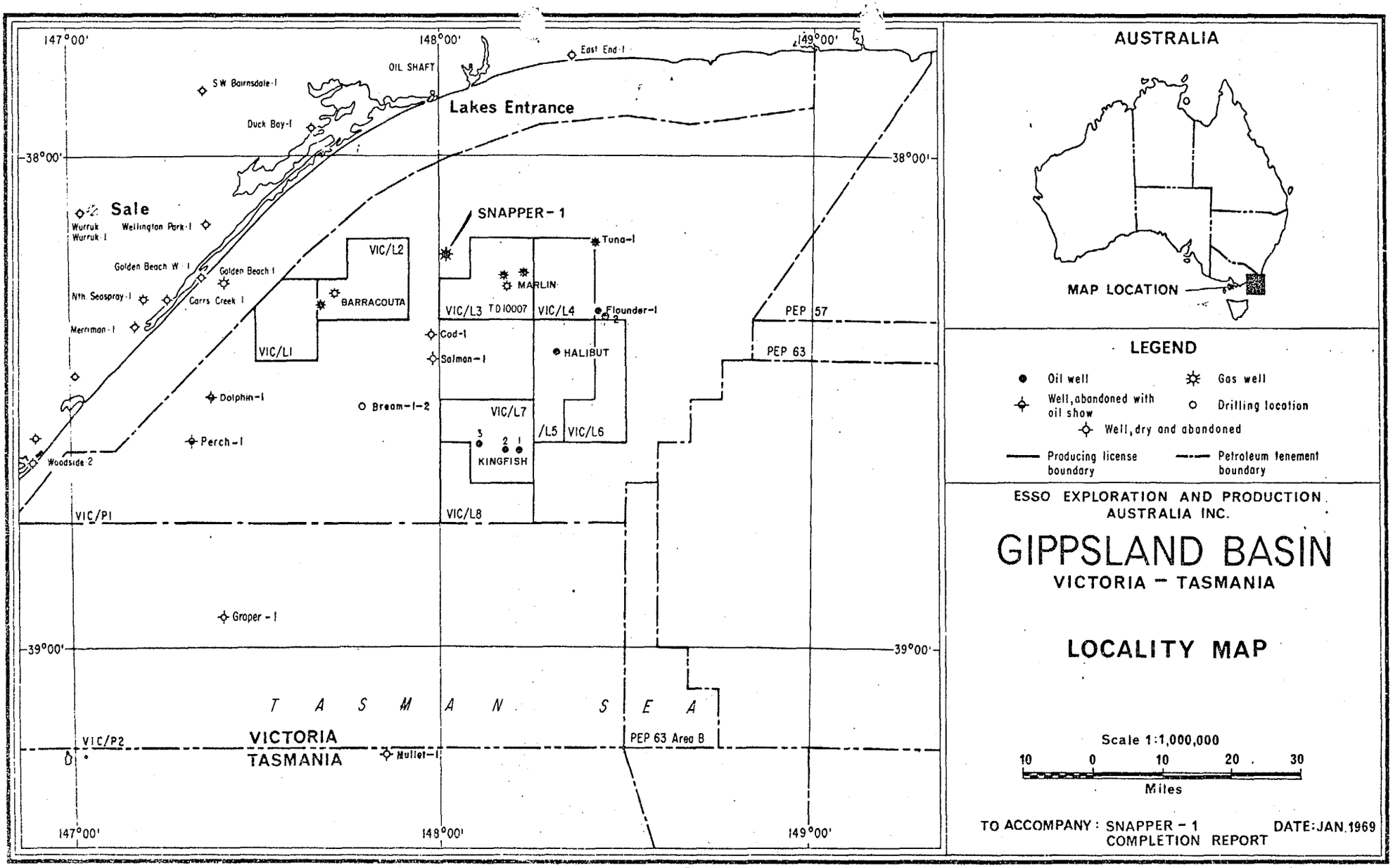

THE GIPPSLAND BASIN
VICTORIA
TASMANIA
VICTORIA
MAP INDEX

SD-239


LATROBE DELTA TOPOGRAPHIC SURFACE
INTRA N. dispersus
INDEX MAP
LEGEND
SNAPPER PROSPECT
GIPPSLAND BASIN - VICTORIA
STRUCTURE MAPS
AND
GEOLOGICAL CROSS - SECTIONS
PLATE I

LATROBE DELTA TOPOGRAPHIC SURFACE





AUSTRALIA

LEGEND

- Oil well
- Gas well
- Well, abandoned with oil show
- Drilling location
- Well, dry and abandoned
- Producing license boundary
- Petroleum tenement boundary

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

GIPPSLAND BASIN

VICTORIA – TASMANIA

LOCALITY MAP

Scale 1:1,000,000

10 0 10 20 30

Miles

TO ACCOMPANY: SNAPPER – 1 COMPLETION REPORT

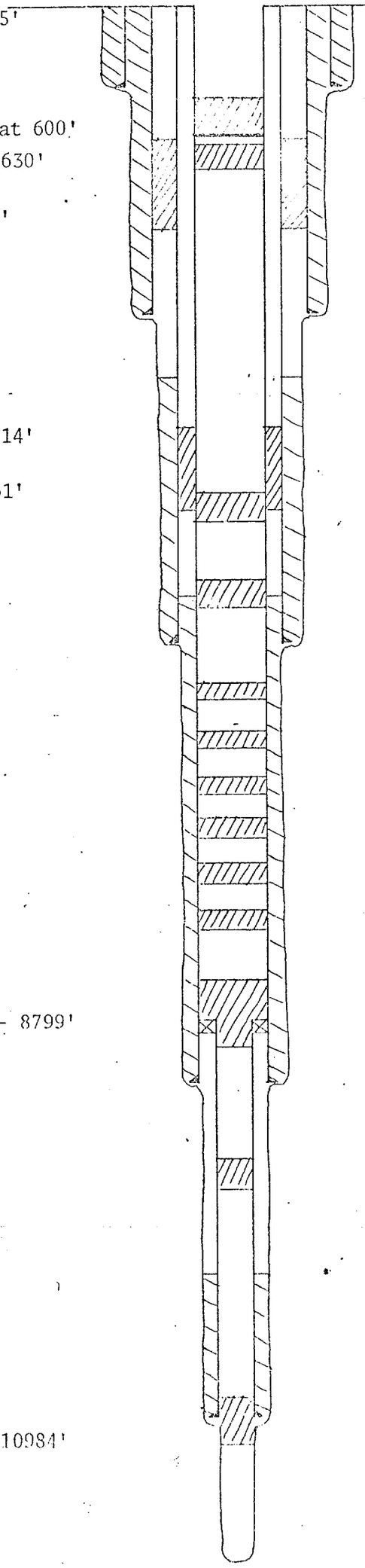
DATE: JAN. 1969

FIGURE 1

So-238 DWG 1055/OP/1

DOWNHOLE SCHEMATIC OF SNAPPER-1 WELL AS ABANDONED

All depths measured relative to Kelly Bushing on the Ocean Endeavour



Wellhead recovered at 315'

Sea floor at 263'

30" casing at 379'
Cemented to sea floor

Cement plug 600' - 400'
Baker Model 'D' packer at 600'
Perforations at 632' - 630'

Annular plug top at 630'

20" casing at 1734'
Cemented to sea floor

Annular plug 3984' - 3114'

Cement plug 4032' - 3861'

13-3/8" casing at 4827'
Cemented to 2122'

Cement plug 9296' - 8799'

Liner top at 9161'

9-5/8" casing at 9368'
Cemented to 4452'

7-5/8" liner at 11,507'

Cement plug 11652' - 10984'

SNAPPER-1 DATA RECORD

DISCOVERY, OIL & GAS WELL.

SNAPPER-1 ESSO.

SPUD. 9-5-1968.
COMP. 7-1-1969.
T.D. 12,320'.
W.D. 180'.

519

38° 22' 03.5"
148° 00' 50"E
DISCOVER II R.T.
OCEAN DIGGER K.B.

I.E.S. SCHLUMBERGER. R1. 9384'-11533'. SEPARATE LOGS 2" AND 5".
" . WELEX R1. 327 — 1804. " " 2" " 5".
" " R2. 1683 — 4800 " " 2 " 5".
" " R3. 4773 — 9370 " " 2 " 5".
" " R4. 9314 — 10855 " " 2 " 5".
" . SCHLUM. R1+2. WELEX R1,2+3. 327'-12318'.
B.H.C.S. SCHLUM R1 10500 — 11509. SEPARATE LOGS 2" AND 5".
" " R2. 11524-12319. " " 2" " 5".
ACOUSTIC VELOCITY. WELEX. R1. 327 — 1804. " " 2" " 5".
" " " R2. 1640 - 4802. " " 2" " 5".
" " " R3. 4773 - 9369. " " 2" " 5"
" " " R4. 9300 -10858. " " 2" " 5"
F.D.C. SCHLUM. R1. 9384 - 11533 " " 2" " 5"
" " R2. 11524 - 12318. " " 2" " 5".
DENSITY LOG. WELEX. R2 1682 - 4805. " " 2" " 5"
" " " R3. 9314 - 10860. " " 2" " 5".
GR/N. SCHLUM. R1. 3900 - 9384 " " 2" " 5"
" " R2 11524 - 12318. " " 2" " 5".
RADIOACTIVITY LOG WELEX. R1. 3800 - 4804. " " 2" " 5"
" " " R2. 4650 - 9373 SEPARATE LOGS 2" AND 5"
" " " R3. 9300 - 10560. " " 2" " 5"
CEMENT BOND LOG. SCH. R1. 3900 - 9384. " " 2" " 5
" " " " R2 9350 - 11524. " " 2" " 5"
FORXO LOG. WELEX. R1 4650 - 9367 " " 2" " 5"
C.D.M. SCHLUMBERGER. R1. 5" & 2". 10500 - 11518.
F.I.T. SCHLUM. R1. TESTS 1-5. R2. 1-5. R3. 1-4. R4, 1-17. SEPT
F.I.T. WELEX TESTS 1-6. TESTS 7-10. SEPERATE LOGS.
BARIOD MUDLOG. 1800'-11133'.
S.W.C. DESCRIPTIONS. * VITRINITE REFLECTANCE BY AMOCO. 22046.
CORE " . 1-31. ESSO.
" ANALYSIS RESULTS. B.M.R.
" " REPORT. 1-31. BARIOD. 2 FORMS.
CUTTING DESCRIPTIONS. 2160 - 12,320.
TIME DEPTH CURVE.
WELL SUMMARY.
PALYNOLOGY SHEET BY W.K. HARRIS
2 different

P.T.O.

SNAPPER - 1 CONTINUED.

IES. COMPLETION LOG.

MICROPALAEONTOLOGICAL REPORT BY D. TAYLOR.

PETROGRAPHIC DESCRIPTION OF VOLCANICS 10,820'-10850'.

HYDROCARBONS ENCOUNTERED IN WELL.

" REPORT - SUBSURFACE OIL. EPR 68 - PS118. (J. LEPAGE)

" " " " EPR 69 - PS55. (" ")

COMPOSITE REPORT.

" IES. WELEX.

WEEKLY REPORTS.

WELL COMPLETION REPORT.

CORES. 2-12, 15-27. RECEIVED. 31 CUT.

CUTTINGS. 1800'-4440', 4550'-6510' & 11201'-12320' RECEIVED.

No Radioactivity Log Welesc. Run 1. 2". Coverdale.

NO PALYNOLOGICAL REPORT. T.L.

no Weekly Report 2/9/68. 30/12/68.

may not be one ↑

INTERPRETATIVE

SNAPPER ~~A1~~ WELL

An examination of the logs of the interval 4775-9360 feet with respect to testing of this interval.

Zones which indicated "Sand" on the S. P., Gamma Ray, and Caliper curves, and contained high resistivities were listed and examined:-

4835' - 4890'	By Sonic log - coaly
4990' - 5015'	" " " " and tight
5310' - 5320'	" " " "
5595' - 5605'	" " " "
5680' - 5715'	Test planned for 5700' - 5710'
6840' - 6860'	By Sonic log and Neutron log - tight
6925' - 6940'	" " " " " " " (possibly)
6960' - 6975'	" " " " " " "
7015' - 7055'	" " " " " " "
7110' - 7140'	" " " " " " "
7435' - 7450'	" " " " " " " (possibly)
7800' - 7810'	Test planned for 7800'-7810'
7900' - 7920'	Wire-line test recovered gas and condensate at 7912'
8840' - 8860'	" " " " " oil scum at 8850'
8910' - 8935'	Sonic/Resistivity plot indicate SW = 100%
9025' - 9040'	" " " " SW = 100%
9160' - 9300'	Test planned for 9175' - 9250'

The tight zones should be confirmed with the FoRxo log when this is received.

It is suspected that these tight zones are dolomite or dolomitically cemented sandstone. This can be verified by the individual sample descriptions which we do not have.

P. W. Bollen,
23rd August, 1968.

The FoRxo log was received on the 29th August, 1968, and examined. This log confirmed the tight zones given above.

GEOTRACK

PETROGRAPHY OF EIGHTEEN CORE SAMPLES FROM VARIOUS GIPPSLAND BASIN WELLS:

TUNA-1
TUNA-4
KIPPER-2
SUNFISH-1
WAHOO-1
FLATHEAD-1
SNAPPER-1

A report prepared for the
Esso Australia Ltd
Sydney, Australia

Report prepared by: I.R. Duddy
Petrography by: I.R. Duddy

JULY 1990

REPORT FILED IN TUNA-1 BOX

GEOTRACK REPORT #255

Telephone:

National (03) 344 7214
International 613 344 7214

Facsimile 613 347 5938

Telex AA36185 UNIMEL

Geotrack International Pty Ltd
PO Box 4120
Melbourne University
Victoria 3052
Australia

Samples to:

Room 225
Earth Sciences Bldg
University of Melbourne
Cnr Swanston and Elgin St

SNAPPER FIELD

Snapper Gas Field

Gippsland Basin, Victoria

Owners
Esso Exploration and Prod. Aust. Inc. – 50% – Operator
Hematite Petroleum Pty. Ltd. (B.H.P.)) 50%

Royalties and overrides
6% to Victorian Government, 4% to Commonwealth Government; and 2½% O.R.R. to Lewis G. Weeks.

Lease No.
Exploration Permit for Petroleum (offshore) VIC/P1.

Location
12 mi (19 kms) northwest of Marlin Gas and Oil Field, and 30 mi (48 kms) offshore.

Discovery well
Snapper No. 1

Coordinates:	38° 12' 03" S; 148° 00' 49" E.
Discovery date:	August, 1968.
Drilled by:	"Discoverer II" to 11,740 ft; "Ocean Digger" to 12,320 ft and tested well.
Water depth:	174 ft (53.0 m)
Total depth:	12,320 ft (3,755.1 m)

Productive interval and maximum flow rates
4,477–4,480' (3'):
FARO 4.86 MMcfd plus 13 BC/MMcfg.
9,295–9,325' (30'):
FARO 1.1 MMcfd plus 5 BOPD (39° API), 1/2" t.c., 12 hour test.

Method of location
Reflection seismic.

GEOLOGICAL FACTORS

Producing zone
Latrobe Group

Age
Eocene

Environment of deposition
Non-marine; alluvial-deltaic plain with multiple braided stream systems and deltaic deposits.

Reservoir rock description
Sandstone.

Source rock
Lakes Entrance Formation, and intra-Latrobe shale and coal.

Cap rock
Lakes Entrance Formation (Oligocene) – marine mudstone.

Type of trap
Structural; anticlinal closure at Lakes Entrance unconformity.

Regional setting
Located in north-central portion of offshore Gippsland basin.

Relation to unconformities
Pay sands are directly below a regional unconformity.

Oldest formation penetrated
N.A.

FIELD DESCRIPTION AND DEVELOPMENT DATA

Estimated ultimate recoverable reserves: (Victorian Ministry of Fuel and Power, 1972)
(Gas) 3.2 trillion CF (90.6 billion m^3)
(NGL) 42 ± million bbls (6.7 ± million kls)*

Productive area
sq mi; 17,000 acres; 68.8 sq kms.
Length: 9 mi (14.5 km)
Width: 3.5 mi (5.6 km)

Maximum vertical closure
N.A.

Depth to top of pay zones
Snapper No. 2 well: -3,940 ft (-1,200.9 m)

Interfaces
Gas/water contact -4,565 (-1,391.4 m)

Total hydrocarbon column
(Gas) 625 ft (190.5 m)

Number of wells
Oil – nil, gas – 3, dry – nil; Total – 3.

RESERVOIR DATA

Net pay thickness
N.A.

Number of reservoir beds
Several

Acre-feet
N.A.

Porosity (intergranular)
Good

Permeability
Good

Water saturation
N.A.

Reservoir temperature
N.A.

Initial reservoir pressure
N.A.

Probable drive mechanism
Water drive

Recovery factor
(Gas) N.A.
(NGL) 13 ± bbls/MMcfg

FLUID PROPERTIES

OIL

Gravity: 39° API at 60°F.
Sulphur (% wt): "Low"
Initial G.O.R.:
Pour point:
Viscosity:
Specific gravity: 0.8300

GAS (non-associated)

	% Volume	(4,477 to 4,480 ft)	
Methane	84.3	Hexanes +	1.55
Ethane	6.3	Nitrogen	0.8
Propane	3.2	Oxygen	–
Isobutane	0.8	Carbon dioxide	1.2
N-butane	1.1	Hydrogen sulphide	22 ppm
Isopentane	0.4	Specific gravity	0.702 *
N-pentane	0.4	BTU/cu ft (gross)	1197 *

CONDENSATE

Gravity (°API):
bbls/MMcfg: 13 ±
Specific gravity:

PRODUCTION DATA

No development plans for the field have been announced.

COSTS

Not available, see Marlin and Barracouta Fields.

REMARKS

1. Snapper drilling and detailed seismic surveys were not subsidized, consequently data and results are 'company confidential'.
2. Snapper Gas Field was declared commercial in June, 1969.
3. In Snapper No. 1 small shows of gas and/or oil in thin tight sands reported below 5,600 ft (1,707 m). Non-commercial gas shows were also present in a sand at 9,295 ft (2,833 m).

REFERENCES

Konecki, M.C. and K. Blair, 1970.
Ministry of Fuel and Power of Victoria, 1971 and 1972.
Robinson, K., and W.J. Stewart, 1970.
Stratton, M.A., 1971 and 1972.

FOOTNOTES

* Editor's estimate.

SAMPLE DESCRIPTIONS

Sample Descriptions

2160-90	100% Mudstone; grey, silty, soft-fissile (non-calcareous) trace of fossil fragments. When dry becomes white and very adhesive to tongue. 100 grams in retort - cooked out 45 grams water.
2190-2340	As above.
2340-70	As above, with trace of sand and chert, clear-red, angular, medium grained.
2370-2440	As above.
2440-2470	As above, with trace marl, grey, silty.
2470-2500	As above.
2500-2520	As above, with trace fossil fragments; limestone, white angular, coarse grained, sand and chert, medium-coarse grained, white-red.
2520-50	As above. 100% Mudstone, grey, silty, soft-fissile - firm, (non-calcareous). When dry becomes white and very adhesive to tongue. Trace fossil fragments.
2550-2580	As above, trace fossil fragments, trace limestone, white, coarse grained, angular, trace of chert, trace glauconite.
2580-2800	As above.
2800-2860	As above.
2860-2890	As above.
2890-3020	As above.
3020-30	Mudstone: grey, slightly silty, non calcareous, soft-firm, with trace calcareous mudstone and trace fossiliferous fragments, trace hert.
3030-40	As above, very little sample coming over shaker.
3040-50	As above, with trace of limestone, white, buff, very coarse grains, angular.
3050-60	As above, slight increase in limestone fragments. Still less than 1%.
3060-70	As above.
3070-90	As above.
3090-3100	As above, with slight increase in calcareous mudstone. Less than 1%.
3100-3110	As above.
3110-3120	As above, with trace of sandstone, light grey, fine grained with grey calcitic clay matrix - large angular chert fragment.
3120-3160	As above.
3160-3170	Mudstone; grey, slightly silty, non calcareous, soft-firm, as above, with trace calcareous mudstone, trace fossil fragments, and few limestone fragments.
3170-80	As above; chert fragments.
3180-3210	As above.
3210-20	As above; trace fossil fragments, limestone, chert.

3220-30	As above; trace sandstone with dolomitic clay matrix. Very poor volume of samples over shaker.
3230-40	As above; no accessories; mudstone with grey-light grey colour.
3240-3290	As above.
3290-3300	Found 100' depth discrepancy. Adjusted samples up to 3390'. Believed the error occurred at

NOTE: _____ Probably the missing section is mudstone.

3390-3420	As above; trace fossil fragments
3420-30	Mudstone; grey-light grey, slightly silty, soft-firm, non calcareous, as above. Trace fossil fragments, trace calcareous mudstone.
3430-40	100% as above.
3440-60	100% mudstone as above.
3460-70	As above; changed from sea water to mud concentrate 3537±.
3470-80	As above; with one chip of greenish grey calcareous mudstone.
3480-90	Lithologic change. Mudstone; light grey-brown, calcareous, silty, soft to hard, fossiliferous.
3490-3500	As above; 3480-90, with fragments of chert, limestone, trace pyrite and glauconite, trace sand, medium grained, clear, angular to rounded, and calcarenite.
3500-3510	As above.
3510-20	As above.
3520-30	Mudstone; grey-greenish grey, silty, calcareous, calcarenite. Highly fossiliferous, angular, coarse grained fragments, chert and sand.
3530-40	As above, with aggregates of pyrite.
3540-50	As above; sample slightly affected by mud.
3550-80	As above.
3580-3600	Samples very poor due to mud. Sample volume small. Won's wash easily. As above.
3600-10	Due to mud - sample impossible to describe. Complained to Esso engineer. He ignored complaint. Sample quality and volume into wash and dry very poor.
3610-90	As above.
3690-3700	Mudstone; grey-green, slightly silty, very calcareous. Calcarenite, buff, fine grained, trace of glauconite and pyrite, fossiliferous.
3700-10	As above.
3710-20	As above.
3720-30	Mudstone; grey-green, silty, very calcareous; with trace pyrite, sand, chert. Fossiliferous as above.

3730-40	As above.
3740-50	As above; poor sample due to mud.
3750-60	Mudstone; as above, with trace of fine grained sand. poor sample.
3760-70	As above, with trace carbonaceous flecks. Very poor sample due to mud. Almost unusable.
3770-3890	As above (3760-70)
3890-3900	Sample okay. Mudstone; grey-green, very calcareous, silty, fossil debris, trace of glauconite and carbonaceous flecks.
3900-3910	As above (3890-3900)
3910-3960	As above, except poor sample (Show of gas at 3960).
3960-3970	As above; mudstone; grey-green, calcareous, silty, with trace very fine grained sand and fossil debris and slightly increased fine grained glauconite.
3970-90	As above; slight increase in fine grained sand and slight fine grained glauconite.
3990-4000 Top of Latrobe 3990'	30% sand; clear-frosted, medium to coarse grained, with some fines. Sub angular to sub rounded. No fluorescence; aggregates of brown, hard, dolomitic sandstone. 70% Lakes Entrance mudstones, trace glauconite and pyrite.
4000-4020	50% sand as above.
4120-30	70% Sand; Lakes Entrance cavings. No fluorescence. Some dolomitic sandstone, brown, some fine grained sandstone, and fine grained glauconite and trace pyrite.
4130-4140	As above; 70% sand as above. No fluorescence.
4140-50	80% Sand; clear-frosted, medium-coarse grained, some granule and very fine grained sand; sub angular to sub rounded, unconsolidated, with some fine grained glauconite aggregates of dolomitic sandstone; brown, aggregates of pyrite; Lakes Entrance cavings, as above.

SNAPPER A-1

REAMED SAMPLES

4060-4070	100% Cavings, Lakes Entrance midstone and miocene light grey-green, calcareous and non calcareous, cement fossiliferous debris, coal; sand medium-coarse grained, glauconite
4070-4080	As above
4080-4090	As above
4190-4100	80% Cavings as above 20% Sand, medium-very coarse grained, coarse-fine subangular-subrounded, Trace coal
4100-10	80% Cavings as above 10% Sand as above 10% Coal
4110-30	As above 4100-10
4130-40	As above
4140-4150	70% Cavings as above 20% Coal 10% Sand as above
4150-60	80% Cavings as above 20% Sand as above Trace coal
4160-70	As above
4170-80	70% Cavings as above 30% Sand as above Trace coal
4180-90	70% Cavings as above 20% Sand as above 10% Coal as above
4190-4200	80% Cavings as above 10% Sand as above 10% Coal as above
4200-4210	50% Cavings as above 40% Sand as above 10% Coal as above
4210-4220	80% Cavings as above 20% Sand as above Trace coal
4220-4230	60% Cavings as above 30% Sand as above 10% Coal
4230-40	50% Cavings as above 30% Coal: as above 10% Sand as above
4240-4250	50% Cavings as above 40% Sand as above 10% Coal as above

4250-60	70% Cavings as above 30% Sand as above Trace coal as above
4260-70	As above 4250-60
4270-80	80% Cavings as above 20% Sand as above Trace coal
4280-90	As above

REAMING SAMPLES 4319 - 4676

4310-4320	80%	Shale, light grey, firm, micaceous.
	20%	Sand, loose quartz grains, coarse to very coarse, subrounded.
4320-4330	50%	Shale, medium grey, micaceous
	40%	Sand, clear to frosted loose quartz grains, medium to very coarse, subangular to subrounded
	10%	Coal, black
4340-4340	80%	Coal
	10%	(Sand
	10%	(Shale
4340-4350	60%	Coal
	20%	Sand
	20%	Shale
4350-4360	80%	Coal
	10%	Mudstone; silty, firm, micaceous, calcareous
	10%	Sand; loose quartz grains, medium to very coarse.
4360-4370	30%	Coal; black, conchoidal fracture, trace pyrite
	30%	Mudstone; medium grey, firm, silty in part.
	40%	Sand, loose clear to frosted, medium to coarse quartz grains, subround
		Trace siltstone, brown, firm.
4370-4410		Missed
4410-4420	80%	Sand; coarse to very coarse, loose quartz grains, clear to frosted, subangular to subrounded, moderate sorting.
	10%	Mudstone; medium grey, firm, silty, carbonaceous, calcareous.
	10%	Coal, black, conchoidal fracture.
4420-4430	100%	Sand, clear to frosted loose quartz grains, coarse to very coarse, subangular to subrounded, good sorting.
		Trace coal
		Trace mudstone
4610-4620	80%	Sand, loose quartz grains, clear to frosted, coarse to pebble size, subangular to subrounded, fair sorting.
	10%	Coal
	10%	Mudstone, medium grey to brown grey, firm, silty, carbonaceous, calcareous.
4620-4630	80%	Sand, coarse to very coarse grained, clear to frosted loose quartz grains, subangular to subrounded, good sorting.
	10%	Coal, black
	10%	Mudstone, medium grey, firm, silty, calcareous.
4630-4640	70%	Sand, clear to frosted loose quartz grains, coarse grained to pebble size, subangular to subrounded, poor sorting.
	10%	Coal, black.
	10%	Mudstone, medium grey, firm, silty and carbonaceous, calcareous.
	10%	Sandstone, light grey, quartz aggregate, firm, very fine to fine grained, pyritic, good sorting, carbonaceous, silty and argillaceous.
4640-4650	60%	Sand; loose quartz grains, clear to frosted, medium grains to pebble size, subangular to subrounded, poor sorting.
	10%	Coal
	10%	Mudstone, as above
	20%	Sandstone, as above

4490-4500	100%	Sandstone, as above, some granule size
		Trace Coal
		Trace Mudstone
4500-4510	100%	Sandstone, as above
		Trace Coal
		Trace Mudstone
4510-4520	95%	Sandstone, as above
	5%	Coal
		Trace Mudstone

Core No. 13. 4399-4427. Cut 28 Rec. 0.5'

Samples caught during coring.

4400-4410 90% Sandstone, clear to frosted loose quartz grains, coarse to very coarse, angular to subrounded, moderately well sorted, excellent porosity and permeability, no fluorescence.
10% Mudstone, medium grey, non calcareous, firm.
Trace coal, black.

4410-4420 90% Sandstone, aa above
10% Mudstone, as above
Trace coal

Core No. 14. 4427-4437 Cut 10 Rec. 0'

Drilled 4437-4445

4420-4430 90% Sandstone, quartzose, loose clear to frosted grains, granule to pebble size, subangular to subrounded, good sorting, excellent porosity and permeability.
10% Mudstone, medium grey, silty, non calcareous.
Trace coal, black.

4430-4440 80% Sandstone, as above
20% Silty mudstone, as above
Trace coal, as above

4440-4445 60% Sandstone, as above
40% Silty mudstone as above
Trace coal, as above

Core No. 15 4445-4474 Cut 29' Rec. 23' circulated samples.

-4450 70% Sandstone, clear to frosted loose quartz grains, medium to granular, fair sorting, sub-angular to subrounded.
30% Mudstone, medium grey, firm to silty, micaceous
Trace coal

4450-4460 30% Sandstone, clear to frosted loose quartz grains medium to coarse grained, fair sorting, sub-angular to subrounded
10% Coal, black
60% Mudstone as above

4460-4470 80% Sandstone, coarse grained,moderate sorting
20% Mudstone, as above
Trace Coal

Core No. 16 4474-4502 Cut 28' Rec. 3'

4470-4480 80% Sandstone, loose quartz grains, coarse to very coarse, subangular to subrounded, micaceous, moderate sorting, good porosity and permeability.
10% Mudstone, medgium grey, silty.
10% Coal

4480-4490 80% Sandstone, clear to frosted quartz grains, coarse to very coarse, subangular to sub-rounded, moderate sorting, good porosity and permeability.
10% Coal
10% Mudstone, medium grey, firm

4650-4660	90%	Sand, loose clear to frosted quartz grains, coarse to very coarse, subangular to subrounded, good sorting, trace pyrite.
		Trace Coal
	10%	Mudstone, as above
4660-4670	100%	Sand, clear to frosted loose quartz grains, coarse to very coarse grained, subangular to subrounded, good sorting, trace pyrite.
		Trace Coal; black
		Trace Mudstone; medium grey, firm, silty, carbonaceous, calcareous.
4670-4680	90%	Sand, as above, medium to very coarse grained, fair sorting
		Trace Coal
	10%	Mudstone, as above
		Trace Sandstone, light grey, quartz aggregate, very fine to fine grained, silty, argillaceous.
4680-4690	90%	Sand, clear to frosted loose quartz grains, medium granule, poorly sorted, subangular to subrounded, pyritic.
		Trace Coal
	10%	Mudstone as above
		Trace Sandstone, quartz aggregate, light grey, very fine to fine grained silty, carbonaceous.
4690-4700	90%	Sand, as above
		Trace Coal
	10%	Mudstone, as above
		Trace Siltstone, brown grey, firm, some very fine sand grains, argillaceous, carbonaceous.
4700-4710	90%	Sand, loose clear to frosted quartz grains, medium to pebble size, subangular to subrounded, poor sorting, pyritic.
		Trace coal
	10%	Mudstone, medium grey, firm, silty, carbonaceous, calcareous.
4710-4720	80%	Coal, black
	20%	Sand, loose clear to frosted quartz grains, fine to coarse grained, subangular to subrounded, fair sorting.
4720-4730	20%	Coal
	60%	Sand, medium granule size, poor sorting, loose quartz grains
	20%	Mudstone, medium grey to brown grey, firm, micaceous, silty, carbonaceous, slightly calcareous.
4730-4740		Soft muddy sample - can't wash clean
	10%	Coal
	10%	Sand, as above
	80%	Mudstone, brown grey, soft, carbonaceous, slightly calcareous.
4740-4750		Soft mushy sample
	100%	Mudstone, brown grey, soft, slightly calcareous
		Trace coal
		Trace sand, as above
4750-4760	70%	Sand, clear to frosted loose quartz grains, fine to very coarse grained, subangular to subrounded, fair sorting.
	10%	Coal
	20%	Mudstone, medium grey to brown grey, firm, slightly calcareous, micaceous.
4760-4770		Trace Coal
	40%	Mudstone, medium grey to brown grey, firm, calcareous, micaceous, silty in part
	10%	Siltstone, light grey to medium grey, firm, carbonaceous
	50%	Sand, as above

4770-4780	80%	Sand, as above
		Trace Coal
	20%	Mudstone, medium grey, firm, silty, calcareous,micaceous
4780-4790	80%	Sand, loose clear to frosted quartz grains, very fine to pebble size, subangular to subrounded, poor sorting,pyritic.
	20%	Mudstone, as above
		Trace Coal
4790-4800	70%	Sand, coarse to very coarse, mainly subrounded, fair sorting
	10%	Coal
	20%	Mudstone, medium grey, firm, calcareous, silty,micaceous.
		Trace Sandstone, light grey, quartz aggregate, very fine to fine grained
4800-4810	20%	Sand, as above
	70%	Mudstone, medium grey, silty, calcareous, poor sample
	10%	Coal
4810-4820	60%	Coal, black
	20%	Sand, as above
	10%	Mudstone as above
	10%	Sandstone, light grey, aggregate, coaly, very fine to fine grained, silty, argillaceous.

Drilling break at 4830, drilling rate drops from 3.5 min/ft to .6 min/ft. appears to be coal

4820-4830	Coal
4830-4840	Coal
4840-4850	Coal
4850-4860	Coal
4860-4863	Coal

SNAPPER A-1

SAMPLE DESCRIPTIONS - JULY 14, 1968

4870 - 4880	95%	Coal, black, brittle, bleeding gas
	5%	Cement, trace sand, pyrite, fossil debris and mudstone
4880 - 4890	70%	Sand unconsolidated, medium-coarse grained, coarse-fine, subangular-subrounded
	30%	Coal, trace cement
4890 - 4900	80%	Sand, as above,
	20%	Coal, trace cement
4900 - 4910	60%	Sand, as above
	30%	Coal
	10%	Cement
4910 - 4920	80%	Sand, as above
	10%	Coal, as above
	10%	Cement
4920 - 4930	80%	Sand, as above
	20%	Coal, as above, trace cement
4930 - 4940	80%	Sand, as above
	10%	Coal, as above
	10%	Cement
4940 - 4950	90%	Cement
	10%	Sand and Coal as above
4950 - 4960	80%	Cement
	20%	Coal, Trace sand as above
4960 - 4970	70%	Cement
	20%	Sand, as above
	10%	Coal
4970 - 4980	70%	Cement
	10%	Sand
	20%	Coal

SNAPPER A-1

SAMPLE DESCRIPTIONS - JULY 15, 1968

4980-4990	60% Coal as above. 40% Cement, trace sand as above, trace siltstone, grey, carbonaceous.
4990-5000	100% Coal
5000-5010	As above
5010-5020	80% Coal 20% Cement, trace shale, brown, carbonaceous, siltstone, grey, trace sand.
5020-5030	As above
5030-5040	As above
5040-5050	As above
5050-5060	80% Coal 10% Cement 10% Siltstone and shale, brown Trypyrite, trace sand
5060-5070	100% Coal, black, brown, trace sand, shale and siltstone, cement cavings, pyrite
5070-5080	As above
5080-5090	70% Coal 20% Shale and siltstone as above 10% Sand as above
5090-5100	90% Coal 10% Shale and siltstone as above
5100-5110	As above
5110-5120	70% Coal 30% Brown carbonaceous shale and siltstone
5120-5130	50% Siltstone and shale, brown, carbonaceous 50% Coal, Trace sand, pyrite, cement
5130-5140	30% Coal 40% Siltstone as above 30% Shale as above, trace sand, pyrite.
5140-5150	40% Coal 20% Sand as above 10% Sandstone, very fine grain. 30% Siltstone and shale as above
5150-5160	80% Coal as above 10% Siltstone and shale as above 10% Sand
5160-5170	90% Coal as above 10% Siltstone and shale as above, trace sand, pyrite
5170-5180	70% Coal 30% Siltstone and shale as above, trace sand, pyrite Mud is difficult to wash. May be dissolving some shale.
5180-5190	As above
5190-5200	As above

5200-5210	90% Coal 10% Siltstone and shale as above, trace sand, pyrite
5210-5220	70% Coal 20% Siltstone and shale as above, trace sand and sandstone and pyrite 10% Cement
5220-5230	90% Coal 10% Siltstone and shale as above, trace sandstone and pyrite
5230-5240	As above
5240-5250	As above
5250-5260	As above
5260-5270	As above
5270-5280	As above
5280-5290	50% Coal 50% Brown, Carbonaceous Shale and Siltstone, trace sand and pyrite.
5290-5300	40% Shale, grey 40% Coal 20% Carbonaceous Shale and Siltstone
5300-5310	750 units H.W. 90% Coal 10% Shale and Siltstone
5310-5320	80% Coal 20% Shale and Siltstone, brown, grey, carbonaceous, trace sand and pyrite.
5320-5330	As above
5330-5340	As above
5340-5350	90% Coal 10% Shale and Siltstone, trace sand
5350-5360	As above
5360-5370	40% Coal 40% Sand, medium-coarse grain, sub-angular-sub-rounded, coarse-fine unconsolidated 20% Shale and siltstone
5370-5380	Poor Sample 90% Coal 10% Siltstone and shale as above, trace pyrite and sand.
5380-5390	60% Shale, grey 40% Coal, trace carbonaceous, brown siltstone, sand and pyrite.
5390-5400	80% Shale, grey 20% Coal, Trace Sand, very fine grain, and brown carbonaceous siltstone and shale
5400-5410	Poor Sample 70% Coal 20% Shale, grey 10% Other. Very little sample. Mostly gumbo.
5410-5420	Poor sample. Mostly gumbo. As above
5420-5430	Sample OK 100% Coal, black, brown, trace of others.

SNAPPER A-1

SAMPLE DESCRIPTIONS- JULY 16, 1968

NB LAT.	
5430-5440	95% Coal, black, trace brown carbonaceous siltstone and sandstone.
5440-5450	50% Coal 30% Shale and siltstone, brown, carbonaceous 20% Shale, grey and sand, trace pyrite.
5450-5460	95% Coal, trace others.
5460-5470	50% Coal 30% Shale and siltstone, brown carbonaceous 20% Others
5470-5480	Hot wire broken 70% Siltstone, brown, grey, carbonaceous 30% Shale, grey HW 40, Cg0, $C_1$3000, $C_2$350, $C_3$400, $C_4$360, $C_5$2000
5480-5490	Poor sample. No volume. 70% Coal ~~Trace~~ 30% others as above
5490-5500	Poor sample. No volume. Gas trap broken 70% Shale, grey 30% Coal and siltstone
5500-5510	Poor sample. No volume. Gas trap out As above
5510-5520	As above. Poor sample. No volume.
5520-5530	Poor sample. 50% Coal 50% Siltstone and shale
5530-5540	As above.
5540-5550	60% Shale and siltstone 40% Coal

SNAPPER A-1

5550-5570	50% Shale and siltstone 50% Coal
5570-5580	20% Sandstone, unconsolidated quartz grains, fine to coarse, subangular to subrounded, milky, No stain, No fluorescence. 40% Coal 20% Siltstone, dark brown, grey, carbonaceous. 20% Shale, dark grey, carbonaceous, blocky, firm, Heavy Tr. pyrites
5580-5590	50% Coal 20% Sandstone, as above 20% Shale as above 10% Siltstone
5590-5600	40% Coal 40% Sandstone as above, pyritic in part 20% Shale as above
5600-5610	50% Sandstone as above 20% Shale 30% Coal
5610-5620	20% Sandstone as above 30% Shale as above 50% Coal
5620-5630	20% Sandstone as above 40% Shale as above 40% Coal
5630-5640	90% Sandstone, dolomitic, buff, very fine to fine, angular to subangular, moderate to hard, well sorted, tight, dolomitic cement, ~~minimum~~ fluorescence only. Trace Shale 10% Coal
5640-5650	60% Sandstone, mostly unconsolidated, medium to coarse, angular to subrounded, well sorted, probable good poss. fly Trace Sandstone as above Trace ~~white~~ pyrite cement. 20% Coal 10% Shale as above 10% Siltstone, buff to cream, well sorted, No show.
5650-5660	20% Coal as above 20% Shale, dark brown, carbonaceous, as above 30% Siltstone, as above 10% Sandstone as above
5660-5680	80% Sandstone, dolomitic, buff, very fine to fine, occasional medium, subangular, well sorted, medium hard to hard, ti ght, min. fluorescence only, occasionally abundant pyrite. 10% Coal 10% Shale
5680-5690	60% Sandstone, dolomitic, as above, with carbonaceous laminae 30% Shale 10% Coal
5690-5700	50% Sandstone, unconsolidated, in part dolomitic as above 40% Coal as above 10% Shale as above
5700-5710	50% Sandstone, unconsolidated and dolomitic as above(50-50) 50% Coal as above

5710-5720
60% Sandstone, dolomitic, as above
30% Coal as above
10% Shale as above

5720-5730
100% Coal
Trace Sandstone as above

5730-5740
20% Sandstone
40% Coal
20% Siltstone
20% Shale, dark brown, grey, carbonaceous

5740-5750
40% Coal
40% Siltstone, buff to dark brown, carbonaceous laminae, well sorted, tight, No show.
20% Shale, silty, dark brown grey, blocky to weak fissile.
Trace Sandstone as above

5750-5760
60% Shale, dark brown grey, slightly silty, blocky to fissile. carbonaceous
10% Siltstone, as above
20% Sandstone, dolomitic as above
10% Coal

5760-5770
50% Siltstone, buff to dark brown grey, occasionally carbonaceous laminae, blocky to faintly laminae, interbedded with very fine grain dolomitic sandstone as above
20% Sandstone, dolomitic as above, very fine to fine, subangular, well sorted, buff, tight, hard, min. fluorescence only, No stain, no cut.
10% Shale as above
20% Coal

5770-5780
30% Sandstone, very fine to silt size, buff to light brown, tight, some dolomitic cement, tight. Minimum fluorescence only
60% Shale as above
10% Coal

5780-5790
20% Sandstone as above
80% Siltstone argillaceous, brown grey, tight, with carbonaceous laminae
Trace coal

5790-5800
60% Siltstone, as above, brown grey to pale yellow brown, with carbonaceous laminae, occasional weakly laminae to blocky.
30% Coal
10% Sandstone, as above

5800-5810
30% Siltstone, as above
30% Shale, silty, brown grey, carbonaceous, blocky, firm.
30% Coal
10% Sandstone, as above

5810-5820
30% Coal as above
30% Siltstone as above
30% Shale as above
10% Sandstone as above

5820-5830
20% Coal
30% Siltstone
40% Shale, silty
10% Sandstone, as above, becoming argillaceous with clay filled pores

5830-5840
80% Coal
10% Siltstone as above
10% Shale as above
Trace Sandstone

5840-5850

40% Coal
30% Shale as above
20% Siltstone as above
10% Sandstone, dolomitic as above, 1 chip sandstone, very light grey, with 5% lithics, very fine to fine, subangular, well sorted, soft, fair porosity, some slight clay plugging, bright pin point yellow fluorescence, fr crush cut. No stain (only one chip in entire sample of 70-100 grams. could possibly be a caving.)

5850-5880

80% Coal as above)
20% Shale as above) LAT

5920-5930

30% Coal (Sample qual. 1 poor contaminated)
40% Shale, dark brown grey, blocky
20% Siltstone
10% Sandstone, white -buff, very fine to fine, pyrite ~~c~~e abundant, medium sorted, a few scattered chips very ~~fine~~ friable white, very fine to fine grained, subangular, subrounded, ~~friable~~, pinpoint ~~yet black~~ yellow fluorescence, ~~trace~~ fair cut occurring in thin laminations.

5930-5940

70% Shale as above, carbonaceous, brown grey, blocky
10% Coal
20% Siltstone, buff to medium light grey

5940-5950

50% Coal
40% Shale
10% Siltstone

5950-5960

70% Shale
10% Coal
70% Sandstone, buff, silt~~stone~~ to, very fine, subangular, well sorted, No show. heavy Trace sandstone, white with show pinpoint fluorescence, poor cut occurring between laminations of carbonaceous material.

5960-5970

60% Shale
10% Coal
20% Siltstone
10% Sandstone as above, appears tight, heavy trace with show as above.

5970-5980
90% Coal
10% Shale
Trace siltstone as above

5990-6000
30% Coal
30% Shale, brown grey, blocky, firm
30% Siltstone, light grey to buff
10% Sandstone, very fine to fine in part unconsolidated, slight trace with show as above

6000-6010
40% Coal
30% Shale
20% Siltstone
10% Sandstone as above, rare trace with show asabove

6010-6020
20% Coal
30% Shale
20% Siltstone as above
30% Sandstone, very fine, subangular, well sorted, unconsolidated, rare trace of show

6020-6030
70% Coal
30% Silty Shale, dark brown grey, blocky
Trace Siltstone, Trace sandstone as above

6030-6040
40% Coal
50% Silty shale
10% Siltstone,
Trace sandstone

6040-6050
20% Siltstone
20% Sandstone, unconsolidated
20% Coal
40% Shale silty as above

6050-6060
60% Coal
30% Siltstone, in part unconsolidated, silt size quartz grains
10% Shale, silty as above
Trace sandstone as above

6060-6070
10% Sandstone, very fine to fine, subangular to subrounded, well sorted, unconsolidated.
10% Coal
30% Shale, brown grey, carbonaceous, laminated, silty, firm, blocky.
50% Siltstone, light brown grey with mottled dark brown carbonaceous flecks, some white clay interstitial , tight, firm.
No show.

6070-6080
60% Coal
30% Shale
10% Siltstone
Trace Sandstone, unconsolidated in part with with clusters, friable, very light grey to white, very fine to fine, subangular, No show.

6080-6090
50% Coal
40% Shale, silty, dark brown carbonaceous, firm, blocky
10% Siltstone, brown grey,
Trace unconsolidated sandstone, quart grains very fine

6090-6100
30% Siltstone, very fine grained sandstone, light grey to white, friable, well sorted, subrounded, poor porosity, occasional trace sandstone blue white fluorescence, very weak crush cut appears to be tied up in clay, associated with laminae
50% Shale, brown grey, abundant carbonaceous material, slightly fissile, firm
10% Sandstone, mostly unconsolidated very fine, subrounded.
10% Coal

6100-6110
80% Shale as above
10% Sandstone, buff to very light grey, very fine grains, with some silt size, well sorted, some clay interstitial, friable, tight, one chip with blue white fluorescence and weak cut (crush)
10% Coal

6110-6120
70% Sandstone, silt to very fine grain quartz, dolomitic, very light grey, subangular, well sorted, dolomitic cement, firm to medium hard, tight, ~~minimum~~ mineral fluorescence only, only slight trace with show as above
30% Shale as above
Trace Coal as above

6120-6130
20% Sandstone, silty, dolomitic, light grey to light tan, medium hard, s very fine quartz grains, subangular, well sorted, poor porosity (vis), dull yet brown, minimum fluorescence, No cut. Dolomitic cement.
30% Siltstone, light brown grey, tight, moderately hard.
50% Shale, dark brown, grey, very carbonaceous, probably carbonaceous laminae
Trace Coal

6130-6140
10% Sandstone as above
10% Sandstone, white, very fine to silt sized, subangular, well sorted, friable, clay interstitial, poor porosity, appears to be associated with carbonaceous laminae, fair pinpoint blue white fluorescence and poor ribbon cut.
10% Siltstone as above
70% Shale as above

6140-6150
10% Sandstone, slightly dolomitic as above
Slight trace white ss. with show as above
30% Coal as above
60% Shale as above

6150-6160
80% Coal
20% Shale as above
Trace Sandstone as above,
Trace Siltstone, No sandstone with show aa.

6160-6170
40% Coal
50% Shale
10% Sandstone, dolomitic, light grey, very fine to fine, subangular, well sorted, medium hard to hard, tight to poor vis porosity, dull yet brown, ~~minimum~~ mineral fluorescence. No cut.

6170-6180
10% Sandstone, light grey, very fine grained, subangular, well sorted, medium hard, tight, No show.
40% Shale, brown grey, carbonaceous, blocky, in part silty.
50% Coal
Trace resin with bright blue white fluorescence.

6180-6190
10% Sandstone, white to light grey, silt to very fine, as above.
60% Shale, dark brown grey to dark brown, in part, very carbonaceous, blocky, firm.
30% Coal,
Trace sandstone. aa

6190-6200
100% Shale, silty, very carbonaceous, dark brown grey, bleeding gas, blocky to weakly fissile
Trace siltstone
Trace coal

6200-6210
20% Sandstone, unconsolidated, very fine to fine, subrounded, well sorted, No show.
30% Coal
50% Shale as above

6210-6220
40% Sandstone, unconsolidated, as above
50% Shale as above
10% Coal

6220-6230
30% Sandstone, unconsolidated, as above
30% Coal
10% Sandstone, dolomitic, buff, very fine to fine, some silt sized quartz, subangular to subrounded, well sorted, dolomitic cement, hard, tight, ~~minimum~~ fluorescence only.
30% Shale, very carbonaceous, very dark brown grey, blocky, firm.
Trace Siltstone

6230-6240
20% Sandstone, unconsolidated, as above
30% Coal
10% Sandstone, dolomitic, as above with trace pyrite
40% Carbonaceous shale as above

6240-6250
LAT
70% Shale, carbonaceous, brown grey, as above
30% Coal

6260-6270
20% Siltstone, buff to light brown grey
10% Coal
70% Shale
Trace Sandstone

6270-6280
20% Coal
10% Sandstone, light grey tobuff, very fine to fine, subangular, well sorted with carbonaceous debris, occasional white sandstone very fine to fine grains, subrounded, associated commonly with wavy carbonaceous laminae, clay plugging ~~yet~~ fluorescence and poor weak cut, if hydrocarbon, tied up with clay, possible clay is fluorescent and giving weak cut when crushed.
30% Siltstone
40% Shale, brown grey, carbonaceous

6280-6290
20% Sandstone, light grey, to light brown, disseminated carbonaceous, silt to very fine, subangular to subrounded, well sorted, some clay plugging, tight to poor porosity, No show, slight trace with fluorescence as above.
30% Siltstone, light brown grey, carbonaceous.
20% Coal
30% Shale

6290-6300
10% Sandstone, as above, No show.
30% Siltstone
10% Coal
50% Shale

6300-6310
20% Sandstone, in part unconsolidated, slight trace with show as in 6270-80.
20% Siltstone
Trace % Coal
60% Shale, dark brown grey, ~~slightly~~ silty very carbonaceous, blocky.

6310-6320
10% Sandstone, as above
20% Siltstone,
Trace Coal
70% Shale, silty

6320-6330
30% Sandstone, white to light grey, to brown, clay interstitial common with wavy carbonaceous laminae
10% Coal
50% shale, aa
10% siltstone, aa

6330-6350
20% Sandstone, buff to brown grey, very fine to fine, sub-rounded, well sorted, friable, clay interstitial, No show.
20% Siltstone, medium grey to brown grey, sandy, very fine quartz grains, tight.
10% Coal
50% Shale, brown grey, silty

6350-6360
30% Sandstone, unconsolidated in part sandstone as above
20% Coal as above
10% Siltstone as above
40% Shale as above

6360-6370
20% Sandstone, as in 6330-6350
20% Coal
10% Siltstone
50% Shale, brown grey, silty in part, carbonaceous, firm.

6370-6380
10% Sandstone, light brown grey to medium brown grey, argillaceous, silty, silt to very fine grained quartz, interstitial clay, moderately sorted, firm, tight, No show.
30% Siltstone, medium light grey to light brown grey, sandy with very fine quartz grains, firm, tight, No show.
10% Coal
50% Shale, brown grey, carbonaceous, silty, bleeding gas

6380-6390
10% Sandstone, as above
30% Siltstone, brown grey, argillaceous, sandy
Trace Coal
60% Shale, brown grey, very silty, blocky

6390-6400
40% Sandstone
20% Siltstone
40% Coal
30% Shale, as above

6400-6410
10% Sandstone
20% Coal
10% Siltstone, argillaceous, brown to grey, as above
60% Shale, brown grey, very silty, carbonaceous

6410-6420
10% Sandstone
10% Siltstone
20% Shale
60% Coal

6420-6430
70% Shale
20% Coal
10% Siltstone
Trace Sandstone

6430-6450
20% Sandstone, white to buff to grey brown, very fine to fine, subangular to subrounded, silty in part, clay plugging common , pyritic in part, friable to hard, tight, No show, carbonaceous laminae common
10% Siltstone, light grey to grey brown, often sandy, argillaceous, firm, No show.
10% Coal
60% Shale, brown grey, carbonaceous, silty common

6450-6460
Trace Sandstone
10% Siltstone
20% Coal
70% Silty shale

6460-6470
100% Coal
Trace Shale as above

6470-6480
20% Sandstone, very fine to fine, occasionally medium to coarse, unconsolidated, subangular, moderately sorted, occasional cluster, very friable,
20% Shale, as above
10% Siltstone
50% Coal

6480-6490
20% Sandstone, dark to very light grey, some clay plugging, subrounded, well sorted, friable, in part unconsolidated, No show except for slight trace with pin point yellow fluorescent and very poor crush cut.
20% Shale as above
20% Siltstone
40% Coal

6490-6510
10% Sandstone as above with No show, becoming pyritic in part.
20% Siltstone, brown grey to very light grey, sandy with very fine quartz grains.
30% Coal
40% Shale, dark brown grey, carbonaceous, silty

6510-6520
40% Sandstone, light grey, very fine to medium, occasionally coarse, in part, loose grains present, subangular, poorly sorted, moderately hard, becoming dolomitic, No show,
10% Siltstone, as above
20% Coal
30% Shale as above

6520-6530
50% Sandstone, light grey as above, No show
40% Coal
10% Shale, as above

6530-6540
60% Coal
30% Shale
10% Sandstone, light grey, very fine to fine, subrounded, well sorted, some weathered feldspar, some clay interstitial, friable, poor porosity, No show.

6540-6450
60% Coal
30% Shale
10% Sandstone as above, in part unconsolidated

6560-6570
10% to Trace Sandstone, pyritic in part, rare trace with green to blue white fluorescence, No cut (? radioactive clay?)
10% Coal
80% Shale, brown grey, carbonaceous, silty, blocky, firm.

6570-6580
10% Sandstone
10% Siltstone, sand with very fine quartz grains, light grey to grey brown
10% Coal
70% Shale as above

6580-6590
10% Sandstone as above, trace pyrite
10% Siltstone
20% Shale as above
60% Coal

6590-6600
Trace Sandstone
Trace Siltstone
20% Coal
80% Shale

6600-6610
10% Sandstone, mostly unconsolidated, fine to medium, subrounded,
50% Siltstone, buff to cream, some clay interstitial, firm to very hard, non dolomitic or calcareous, approaches ortho quartzite in part
30% Coal
20% Shale as above

6610-6620
30% Sandstone, unconsolidated, very fine to fine, subangular, in part pyritic
20% Siltstone, as above
10% Shale
40% Coal

6620-6630
10% Sandstone, as above
10% Siltstone, as above
20% Shale as above
10% Coal
50% Clay, white, soft, gummy

6630-6640
10% Sandstone
10% Shale
10% Shale
70% White clay (bentonitic)

6640-6650
50% Sandstone, unconsolidated, very coarse grains, subangular to subrounded, well sorted, No show.
10% Pyrite
10% Coal
10% Siltstone white to buff
20% Shale

6650-6660
20% Sandstone, unconsolidated as above, in part very pyritic
20% Coal
10% Shale
50% White clay as above

6660-6670
40% Sandstone, unconsolidated as above, in part dolomitic, buff, find to medium to coarse, subangular to subrounded, hard, tight, No show, occasionally pyritic as above
10% Shale
10% Coal
Trace Siltstone
40% White clay

6670-6680
60% Sandstone, dolomitic, in part unconsolidated, pyrite in part, buff to cream, with clear to milky quartz grains, fine to medium to coarse, moderately hard, poor porosity, ~~minimum~~ mineral fluorescene only.
30% Shale, brown grey, silty, carbonaceous, probably cavings.
10% Coal

6680-6690
80% Sandstone, unconsolidated, very fine to granular, angular to subrounded, frosted , poorly sorted, clear to milky quartz grains. No show, in part dolomitic as above, with occasional pyrite
10% Shale
10% Coal

6690-6700
30% Sandstone as above
10% Shale, brown grey, carbonaceous, silty
Trace Coal
60% White to cream bentonitic clay to shale

6700-6730
10% Loose fine to very fine quartz grains,
20% Shale, brown grey
70% Bentonic shale, white to cream

6730-6740
90% White to cream kaolin or bentonic clay, soft, gummy
10% brown Shale cavings
Trace Sandstone
Trace Coal

6746-6455
Core No. 23

6750-6760
60% Siltstone to fine grained Sandstone, white to buff, clay choked, quartzose, low porosity and low permeability,
30% Shale, brown, carbon, probably cavings
5% Coal
5% Pyrite,
Strong trace sand, loose, unconsolidated, fine to medium grains.

6760-6770
60% Siltstone to fine grained Sandstone
30% Shale, brown
10% Coal, cavings?
Strong trace pyrite

6770-6780
70% Siltstone to fine grain sandstone. The pyrite is coming from this unit and can be seen in some fragments.
20% Shale, brown and black
10% Coal, cavings?
Trace clay

6780-6790
50% Siltstone to fine grained sandstone
30% Shale brown and black
20% Sand, white, quartzose, loose, unconsolidated, fine to coarse, ~~grey~~ white, subrounded to subangular, frosted to clear,
Strong trace coal, pyrite, mineral fluorescence only.

6790-6800
60% Sand aa. but fine to very coarse
30% Shale aa.
10% Siltstone, to fine grained Sandstone
Strong trace coal, trace pyrite, trace amber,
Mineral fluorescence only

6800-6810
60% sand aa
30% shale aa
10% siltstone aa

6810-6820
40% Sand aa
20% Siltstone to fine grained Sandstone aa
20% Shale aa
20% Coal
Strong trace pyrite, trace amber, mineral fluorescence only.

6820-6830
60% Siltstone to fine grained sandstone
20% Shale brown and black
15% Coal
5% Pyrite
Trace clay, amber

6830-6840
50% Siltstone to fine grained Sandstone
30% Shale
15% Coal
5% Pyrite

6840-6850
40% Sandstone, fine to medium grain, white to cream, quartzose, subangular grains, with dolomitic cement
20% Siltstone to fine grained Sandstone
30% Shale
10% Coal (cavings?)
Strong trace pyrite, Bright yellow fluorescence but only very minor cut, Fluorescence probably mineral fluorescence from dolomitic sandstone.

(Suction tank:	C1	C2	C3	C4	C5+)
(	500 ppm	60	100	100	100)

6850-6860
As for 6840-6850

6860-6870
40% Siltstone to fine grained Sandstone
20% Shale brown and black (cavings?)
20% Sandstone with dolomitic cement occasional
20% Sand, medium to very coarse with ~~ore~~ pebbles, clear to frosted quartz, strong trace pyrite and coal, (pyrite from siltstone and sand), bright mineral fluorescence, No cut.

6870-6890
15% Siltstone to fine grained Sandstone
20% Shale
20% Sandstone with dolomitic cement
40% Sand. Common to see several medium to coarse sand grains held with pyritic cement.
5% Pyrite. Strong trace coal. Bright min.fluor. No cut.

6880-6890

6890-6900
10% Siltstone to fine grained Sandstone
20% Shale
15% Sandstone with dolomitic cement
50% Sand as above
5% Pyrite
Strong trace Coal. Bright min. fluor. No cut.

6900-6910
10% Siltstone to fine grained Sandstone
10% Shale
10% Sandstone with dolomitic cement
65% Sand, mainly coarse to pebbly
5% Pyrite
Strong trace coal.
Bright min. fluor. No cut.

6910-6920
20% Siltstone to medium grained Sandstone.
20% Shale
10% Sandstone with dolomitic cement
40% Sand as above
10% Pyrite
Strong trace Coal. Bright min. fluor. Cut probably contamination

6920-6930
20% Siltstone to fine grained Sandstone
10% Sandstone with dolomitic cement
20% Sand medium to very coarse
10% Shale
40% Sandstone, brown and buff, medium to coarse grained, carbonaceous, medium porosity and permeability.
Strong trace coal, trace pyrite, clay.
Strong mineral fluorescence, slight cut - probably contamination

6930-6940
10% Siltstone to fine grained Sandstone
20% Sandstone with dolomitic cement
30% Sand very fine to coarse
10% Shale
20% Sandstone brown and buff carbonaceous.
10% Coal
Trace pyrite, clay. Strong mineral fluor. No cut.

6940-6950
80% Sandstone, white to cream, quartzose, medium to very coarse grains, dolomitic cement, hard, tight, porosity and permeability low.
10% Siltstone to fine grained Sandstone
10% Sandstone brown carbonaceous
Strong trace coal

6950-6960
As for 6840-6850
Strong mineral fluorescence. Weak cut probably due to contamination as this sample has been in ~~the~~ here for some time.

6960-6970
99. The dolomitic sandstone is fluorescing strongly and gives a creamy cut.

6970-6980
as above

6980-6990
50% Sandstone with dolomitic cement as above
30% Sandstone brown carbonaceous as above
20% Siltstone to fine grained Sandstone as above
Strong trace coal, trace pyrite, strong min.fluor. No cut.

6990-6700
30% Sandstone with dolomitic cement as above
40% Sandstone, buff, light brown and dark brown, carbonaceous, medium porosity and permeability.
10% Siltstone to fine grained Sandstone
20% Coal and dark very carbonaceous shale
Mineral fluorescence, No cut.

7000-7010
30% Sandstone with dolomitic cement
55% Sandstone buff, light brown and dark brown as above
10% Siltstone to fine grain Sandstone
5% Coal
Mineral fluor. Very weak cut.

7010-7020
70% Sandstone with dolomitic cement, ~~moderate~~ medium-very coarse grained subangular to subrounded.
20% Sandstone, buff, light brown and dark brown.
10% Dark very carbonaceous shale
Strong trace coal.
A few of the dark carbonaceous shale fragments can be seen to be "popping" gas profusely but show no fluorescence and give no cut.

7020-7030
80% Sandstone with dolomitic cement
10% Sandstone, buff, light brown and dark brown
10% Dark, very carbonaceous shale - popping gas as above.
Strong trace coal. Trace pyrite. Strong min.fluor and minor cut.

7030-7040
80% Sandstone with dolomitic cement
10% Siltstone, grey, hard, slightly carbonaceous
10% Shale, black, carbonaceous and "popping" gas
Trace coal, pyrite. Bright mineral fluor. No cut.

7040-7050
80% sandstone aa
10% siltstone aa
10% shale aa.

7050-7060
aa. Sandstone in fine to coarse grains

7060-7070
80% sandstone aa
10% siltstone aa
10% shale aa

7070-7080
30% Sandstone withdolomitic cement
50% Sandstone, buff to light brown, fine grained, medium porosity and permeability
10% Siltstone, pyritic, dark brown, carbonaceous
10% Coal
Bright mineral fluor. No cut.

7080-7090
20% Sandstone with dolomitic cement
50% Sandstone buff, light brown very dark brown, fine to medium grain, slightly carbonaceous, medium porosity and permeability, pyritic in places.
20% Shale, very dark brown, carbonaceous, "popping"gas, and dark brown, pyritic and carbonaceous
10% Coal
Mineral fluorescence, No cut.

7090-7100
10% Sandstone with dolomitic cement
70% Sandstone (very fine grained) to siltstone, buff, light brown clay choked, low porosity and permeability.
20% Shale, very dark brown, carbonaceous, and dark brown pyritic and carbonaceous.
Trace mudstone, brown.

7100-7110
30% Sandstone with dolomitic cement
60% Sandstone (very fine grained) to siltstone as above
10% Shale
Strong trace coal.
Very bright mineral fluorescence. No cut.

7110-7120
70% Sand withdolomitic cement
20% Sandstone - siltstone, buff, light and dark brown
10% Shale
Very strong trace coal and pyrite.

7120-7130	90% Sandstone, light grey to light brey brown, very fine grain to coarse grain, dominantly medium to coarse grain, subangular to angular, dolomitic cement which fluoresces a light yellow. 10% Shale-siltstone - light brown grey and brown grey, carbonaceous flecks and traces of plant remains. Trace Coal, black, brittle, bituminous (slight gas kick) Trace pyrites.
7130-7140	100% Sandstone, light grey, as above, generally slightly more coarse than above. Trace Shale to Siltstone as above Trace Coal as above
7140-7150	70% Sandstone as above 30% Shale to siltstone, as above, varies in colour from light grey to buff to brown grey.Light grey variety non-carbonaceous, brown grey richly carbonaceous and medium micaceous.
7150-7160	40% Sandstone as above 60% Shale to siltstone as above and light grey brown and light grey shale as above.
7160-7170	20% Sandstone as above 70% Siltstone to shale, dominantly light brown grey to buff 10% Coal, black, as above
7170-7180	20% Sandstone 70% Siltstone to shale as above 10% Coal
7180-7190	20% Sandstone, as above, with dolomitic cement as above 80% Shale and Siltstone as above, dominantly light grey brown. Trace black to brown coal, as above. Trace pyrites
7190-7200	10% Sandstone, light grey, fine to coarse grain, dominantly fine to medium grain range with occasional coarse grains, brittle, with kaolinitic cement; fragments with dolomitic cement as previously; Dominantly very light grey to white and glassy quartz, occasional grains of smoky quartz, occasional pyritical quartz aggregates. 80% Shale to siltstone, brown grey, light brown grey, and light grey, varying amount of carbonaceous debris grades from shale to siltstone and rarely very fine grains dirty sandstone. 10% Coal, black , brittle, as above.
7200-7210	10% Sandstone, as above 20% Shale - siltstone 70% Coal, black, brittle, (bleeding gas)-Gas kick associated.
7210-7220	Post trip sample 70% Shale - siltstone, dominantly dark brown grey, carbonaceous and micaceous, as above. 20% Coal 10% Sandstone, as above
7220-7230	60% Sandstone, light grey, very fine to coarse grains, poorly sorted; fine to brittle well compacted with dolomitic cement, fine abundant pyritized aggregates of quartz grains as previously(about 10% loose quartz sand grains, dominantly coarse grains, angular to rounded) bright yellow fluorescence, but no cut (1 faint cut in 10 trys - probably due to diesel in mud). 30% Shale to siltstone as above 10% Coal as above

7230-7240
50% Sandstone as above with abundant pyrite aggregates
40% Shale to siltstone as above, dominantly dark brown grey and very carbonaceous.
10% Coal as above NB. Gas kick may represent thin gas sand. No fluorescence, No cut.

7240-7250
50% Sandstone, dominantly loose grains as above, with pyrite aggregates as above
30% Shale to siltstone, dark brown, dominantly very carbonaceous as above
20% Coal, black, grades to dark brown grey, carbonaceous siltstone as above.

7250-7260
30% Sandstone as above
60% Shale to siltstone as above
10% Coal, as above

7260-7270
10% Sandstone as above
90% Dominantly Shale, light grey to light grey brown, with very occasional carbonaceous plant remains. Minor dark brown grey carbonaceous shale to siltstone as above.
Trace coal as above.

7270-7280
80% Sandstone, loose quartz sand grains, clear to white and light grey, fine to very coarse grains, Angular to rounded, and sandstone, light grey, fine to coarse grains, dominantly medium grained with kaolinitic and in part carbonate matrix, very minor amount of pyrite associated with quartz as above.
10% Shale to siltstone as above
10% Coal as above

7280-7290
50% Sandstone as above
20% Shale to siltstone, brown grey and very occasional light brown grey, carbonaceous and micaceous.
30% Coal, brown to black, grades to carbonaceous siltstone as above.

7290-7300
10% Sandstone as above
40% Shale to siltstone, brown grey, carbonaceous as above, micaceous, very fine pyrite
60% Coal as above (No gas associated with this?)

7300-7310
Trace Sand as above
60% Shale to siltstone
40% Coal, brown, black, carbonaceous siltstone as above.

7310-7320
30% Sandstone as above
40% Shale to siltstone, dark brown grey, as above
30% Coal, black as above

7320-7330
10% Sand as above
30% Siltstone as above
60% Coal as above

7330-7340
10% Sand
30% Siltstone to shale as above
60% Coal

7340-7350
50% Sandstone, loose quartz sand grains, fine to coarse grains, subangular to subrounded, poorly sorted and aggregates of sandstone, light grey white, fine to coarse grained, poorly sorted, kaolinitic with min dolomitic cement
40% Shale to siltstone as above
10% Coal, as above

7350-7360
50% Sandstone, loose quartz grains and kaolinitic sandstone as above
40% Shale to siltstone as above
10% Coal

7360-7370	80% Sandstone, loose quartz grains, as above, and dolomitic cemented quartzose sandstone as previously, minor trace pyrite. 20% Shale to siltstone, light grey and light grey brown to dark grey brown; varying amounts of carbonaceous material dark coloured variety rick in carbonaceous material. Trace Coal asabove.
7370-7380	80% Sandstone, light grey, medium to coarse grains, fairly well sorted, fairly well cemented/ carbonate cement with kaolinitic matrix, minor amount pyrite (abundant mineral fluorescence, yellow) 10% Siltstone, brown grey, very carbonaceous, micaceous flakes in part to very fine grained dirty sandstone 10% Coal as above
7380-7390	Trip sample 40% Sandstone as above 30% Shale to siltstone, light brown grey to brown grey carbonaceous as above 30% Coal as above
7390-7400	40% Sandstone as above 60% Shale to siltstone, brown grey and dark grey, grades to very fine grain dirty micaceous, carbonaceous sandstone Trace Coal as above
7400-7410	Trace Sandstone 90% Shale to siltstone, dark brown grey, mainly very carbonaceous 10% Coal as above
7410-7420	70% Sandstone, buff to light brown grey, very fine to coarse grains, dominantly fine grains, kaolinitic matrix, and carbonate cement. Mineral fluorescence, Much pyrite and carbonaceous material disseminated throughout. 20% Shale to siltstone as above 10% Coal as above
7420-7430	10% Sandstone, light grey, fine to coarse grains, kaolinitic, carbonate cement 80% Shale to siltstone, brown grey and light grey, varying carbonaceous material 10% Coal as above (bleeding gas)
7430-7440	10% Sandstone as above 80% Shale to siltstone, brown grey and light grey, varying carbonaceous material 10% Coal as above
7440-7450	90% Sandstone, light grey, fine to very coarse grains, poorly sorted, fairly well cemented, kaolinitic matrix, with abundant dolomitic cement, much mineral fluorescence, no HC cut 10% Shale to siltstone as above Trace Coal. * gas kick to 180 units-(probably thin gas zone. less than 5' thick)
7450-7460	90% Sandstone, light grey, as above 10% Shale to siltstone Trace Coal as above
7460-7470	90% Sandstone as above 10% Shale to siltstone as above Trace Coal as above
7470-7480	20% Sandstone as above 50% Shale to siltstone as above, very carbonaceous 30% Coal

7480-7490
10% Sandstone as above
80% Shale and shale to siltstone, light brown grey to buff and dark brown grey to darker coloured rich in carbonaceous material, grades in part to coal, fairly abundant, very finely crystalline masses of pyrite.
10% Coal as above

7490-7500
30% Sandstone, as above
40% Shale to siltstone
30% Coal, black, brittle, as above

7500-7510
60% Sandstone, light grey, very fine grains to coarse grains, kaolinitic matrix, dolomitic cement, as above
30% Shale to siltstone as above
10% Coal

7510-7520
40% Sandstone as above
20% Shale to Siltstone as above
40% Coal as above

7520-7530
20% Sandstone as above
60% Shale to siltstone, coal as previously
20% Coal as above

7530-7540
20% Sandstone as above
70% Shale to siltstone, varies in colour from light brown grey to dark brown grey - carbonaceous
10% Coal, black, as above

7540-7550
70% Sandstone as above (Trip sample)
20% Shale to siltstone as above
10% Coal as above

7550-7560
30% Sandstone as above
70% Shale to siltstone
Trace Coal

7560-7570
30% Sandstone as above
60% Shale to siltstone as above
10% Coal as above

7570-7580
20% Sandstone as above
60% Shale to siltstone
20% Coal as above

7580-7590
30% Sandstone as above
60% Shale to siltstone as above
10% Coal as above

7590-7600
30% Sandstone
60% Shale to siltstone
10% Coal as above

7600-7610
20% Sandstone as above
50% Shale to siltstone, light brown gray and dark brown grey in part to coal
30% Coal, black - brittle, as above

7610-7620
(Gas kick)
20% Sandstone, light grey, very fine to coarse grains, kaolinitic matrix, dolomitic cement, much mineral fluorescence, as previously: No H-C cut
Trace pyrite
50% Shale to siltstone, light grey to dark brown grey, dark coloured variety, richly carbonaceous and grades in part to a very fine grain dirty micaceous carbonaceous sandstone.
30% Coal as above

7620-7630	50% Sandstone, loose quartz sand grains and sandstone aggregates as above 40% Shale and shale to siltstone as above 10% Coal
7630-7640	30% Sandstone as above 60% Shale to siltstone as above 10% Coal
7640-7650	10% Sandstone as above 80% Shale to siltstone as above 10% Coal as above
7650-7660	30% Sandstone 60% Shale to siltstone 10% Coal as above
7660-7670	20% Sandstone as above, min. pyrite 70% Shale to siltstone 10% Coal
7670-7680	20% Sandstone as above 70% Shale to siltstone 10% Coal
7680-7690	20% Sandstone 60% Shale to siltstone 20% Coal
7690-7700	20% Sandstone (Gas show 7695-7710) 70% Shale to siltstone, coal in part 10% Coal
7700-7710	30% Sandstone, loose quartz sand grains and dolomitic aggregates, as above 50% Shale to siltstone 20% Coal
7710-7720	20% Sandstone, as above 50% Shale to siltstone, colour variation from light brown grey to dark brown grey; dark brown grey grades to coal; micaceous, minor amount pyrite. 30% Coal
7720-7730	20% Sandstone, light grey, loose quartz grains and aggregates with kaolinitic matrix of dolomitic cement as previously. 60% Shale to siltstone as above, coal in part 20% Coal as above
7730-7750	10% Sandstone as above 60% Shale to siltstone 30% Coal
7748-7777	Core No. 24 Recovered 26'
7750-7790	30% Sandstone, light grey, very fine to fine grained, kaolinitic matrix, abundant carbonaceous flakes, fine, soft, fairly well sorted, minor amount of sandstone aggregates, light grey, fine to very coarse grained kaolinitic matrix, dolomitic cement as previously 60% Silty shale to siltstone, dark brown grey to olive brown grey 10% Coal as above
7790-7800	30% Sandstone as above 60% Silty shale as above 10% Coal as above Mineral fluorescence, no HC cut.

7800-7810
90% Sandstone, dominantly loose quartz sand grains clear to white to light grey, medium granule size, Angular to sub-rounded, and sandstone aggregates as above and sandstone light grey, very fine to fine grain with carbonaceous flecks as above; minor pyrite, abundant mineral fluorescence, No definite HC cut.
10% Silty shale to siltstone as above
Trace Coal as above

7810-7820
20% Sandstone, loose grains and aggregates as above, minor pyrites
70% Silty shale to siltstone, light brown grey to dark brown grey, and minor medium olive grey, abundant carbonaceous flecks, largely small coalified plant remains; occasionally see part of vascular plant tissue
10% Coal, black, very brittle, anthracitic, conchoidal fracture in part

7820-7830
50% Sandstone, light grey, very fine to coarse grain, occasionally aggregate as above, and fine grain carbonaceous sandstone with minor amount of loose quartz sand grains from medium to coarse grain, fair amount of pyrite in very fine crystalline fragments
40% Shale to siltstone as above
10% Coal as above

7830-7840
50% Sandstone as above
40% Shale to siltstone as above
10% Coal as above

7840-7850
30% Sandstone as above
60% Shale to siltstone, varies in colour from very light brown grey, to dark brown grey, carbonaceous as above, fairly abundant pyrite masses
10% Coal

7850-7860
40% Sandstone, dominantly loose quartz sand grains as above
50% Shale to siltstone as above
10% Coal as above

7860-7870
20% Sandstone, loose grains as above, aggregate as above and minor very fine grain sandstone, lightgrey, with kaolinitic matrix, carbonacecus material disseminated, as previously (py)
70% Silty shale and siltstone, light olive grey, brown grey and dark brown gray, coaly plant debris as above
10% Coal as above

7870-7880
40% Sandstone as above (py)
50% Shale to siltstone as above
10% Coal

7880-7890
20% Sand
80% Shale to siltstone as above
Trace Coal as above

7890-7900
30% Sandstone, loose grains, fine to coarse aggregates as above and fine grain sandstone as above, pyrite as above
70% Shale to siltstone as above
Trace Coal as above

7900-7910
20% Sandstone as above
80% Shale to siltstone
Trace Coal as above

7910-7920
90% Sandstone, dominantly loose quartz sand grains, coarse grain angular to subrounded, minimum amount kaolinitic material, probably matrix and rare dolomitic aggregates as previously. Mineral fluorescence, but no cut.
10% Shale to siltstone as above
Trace Coal as above

7920-7930	20% Sandstone as above 60% Shale to siltstone as above 20% Coal as above
7930-7940	10% Sandstone as above 90% Shale and siltstone asabove Trace Coal
7940-7950	10% Sandstone as above 90% Shale to siltstone as above Trace Coal as above
7950-7960	Trip sample 10% Sandstone, loose quartz sand grains, coarse to very coarse, subangular to subrounded, and aggregates as above. 80% Silty mudstone (shale) and siltstone as above 10% Coal as above
7960-7970	10% Sandstone as above 90% Shale - (sm) - siltstone as above Trace Coal as above
7970-7980	50% Sandstone, light grey, medium grey, very fine to fine grain, fairly well sorted, much kaolinitic matrix and abundant carbonaceous flecks and thin laminae, minor amount of mineral fluorescence. No HC cut. 50% Silty mudstone, dark brown grey, dark olive grey, very thin veinlets of anthracite coal, coaly plant remains, grades to agrillaceous siltstone. Minor mudstone of brown grey to waxy texture, becomes silty, carbonaceous flecks. Trace Coal, anthracitic as above, fragments of very fine crystalline pyrite
7980-7985	Sandstone, light grey to grey, very fine to fine grains, minimum medium grain, very carbonaceous and argillaceous, (similar to above), abundant fragments fluorescent yellow to buff yellow and give slow light bluish yellow HC cut. Fluorescent fragments are brown stained, generally very fine grain and hard. Sandstone grades to a grey sandy carbonaceous siltstone. Mudstone to siltstone as above Coal as above
7985-7990	30% Sandstone as above, siltstone in part 70% Silty mudstone to siltstone as above Trace Coal as above
7990-8000	20% Sandstone as above, gradational in siltstone in part, becomes a very fine grain silty to dirty carbonaceous sandstone 70% Mainly Argillaceous siltstone, dark brown grey to brown grey, very carbonaceous in part, coaly plant fragments, minor pyrite and very fine micaceous flakes. 10% Coal as above
8000-8005	20% Sandstone as above 40% Argillaceous siltstone as above to silty shale as above 40% Coal, black, anthracitic as above, bleeding gas in part. Coal fragments and very fine grain sandstone, fluorescent and gives a slow light bluishyellow cut. Occasional fragments of resin
8005-8010	30% Sandstone as above 50% Shale to siltstone as above 20% Coal
8010-8020	30% Sandstone, as above 50% Silty mudstone to siltstone as above 20% Coal - anthracitic as above

8020-8030
20% Sandstone as above
80% Silty mudstone - siltstone, very fine grain, carbonaceous sandstone, as above
Trace Coal as above. Eight blue white fluorescent cut.

8030-8040
20% Sandstone as above
60% Silty mudstone to siltstone, as above
20% Coal

8040-8050
10% Sandstone as above
40% Silty mudstone to siltstone
50% Coal as above

8050-8060
20% Sandstone as above
70% Silty mudstone to siltstone as above
10% Coal

8060-8070
20% Sandstone
40% Silty mudstone to siltstone asabove
40% Coal

8070-8080
50% Sandstone, loose quartz sand grains, medium to coarse grains, subangular to subrounded and dirty sandstone, light brown grey, very fine to medium grain, very carbonaceous, minor amount kaolinitic, pyritised to dolomitic cement, mineral fluorescence, yellow to very slight cut, associated with carbonaceous material, grades to siltstone as above.
40% Siltstone and silty mudstone
10% Coal

8080-8090
N.F. Sample

8090-8100
20% Sandstone, dirty as above, siltstone in part
80% Siltstone, silty mudstone as above
Trace Coal as above

8100-8110
10% Sandstone as above
90% Siltstone to silty mudstone as above
Trace Coal as above

8110-8120
10% Sandstone as above
90% Siltstone and silty mudstone as above
Trace Coal as above

8120-8130
Trace Sandstone as above
20% Siltstone and silty mudstone as above
80% Coal, black, brittle, gas kick of 100 units, slight cut from some fragments of coal.

8130-8140
20% Sandstone, mainly grey and dirty as above also, occasional fragments of sandstone, light grey to white, fine to coarse grain, kaolinitic matrix, with trace of carbonate cement.
70% Siltstone to silty mudstone as above
10% Coal as above

8140-8150
20% Sandstone as above
80% Siltstone and silty mudstone as above
Trace Coal as above

8150-8160
20% Sandstone, grey and light grey, very fine to fine grained, micaceous and carbnnaceous, fairly abundant thin carbonaceous laminae and flecks to siltstone as below
70% Siltstone as above, silty mudstone as above
10% Coal

8160-8170
20% Sandstone, as above
80% Siltstone and mudstone as above and sandy siltstone, grey to brown grey - gradational into the above fine grained sandstone
Trace Coal as above

8170-8180
30% Sandstone as above, grades to sandy siltstone as above; much quartz silt washed out in samples.
70% Siltstone, silty mudstone as above
Trace Coal as above

8180-8190
100% Sandstone, light brown grey, salt and pepper colouration, very fine to medium grain, brittle, abundant carbonaceous flecks disseminated throughout, grades to a dirty silty sandstone in part; micaceous flakes and dark coloured lithic grains(?). Dolomitic cement. Much mineral fluorescence, kaolinitic matrix in residues. No HC Cut. Occasional loose quartz grains, medium to very coarse grains.
Trace Shale to siltstone as above
Trace Coal as above

8190-8200
50% Sandstone and silty sand as above
40% Siltstone and silty mudstone as above
10% Coal

8200-8210
20% Sandstone as above
70% Siltstone to very fine grain silty sand and silty mudstone, as above
10% Coal as above

8210-8220
10% Sandstone as above
80% Siltstone, dark brown grey, very carbonaceous and micaceous, grades in part to very fine sandy siltstone, rare fragments of micro crystalline pyrite, non fluorescent; bleeding gas.
10% Coal, black, brittle, as above

8220-8230
30% Sandstone, fine grain to very fine grain, light grey to grey, carbonaceous and argillaceous.
60% Silty mudstone and siltstone which grades to silty sandstone as above
10% Coal as above

8230-8240
70% Sandstone, i) medium grey to dirty fine grain sandstone as above; ii) loose quartz grains from fine to coarse grains, subangular to rounded; iii) Sandstone, light grey to light grey brown, medium to coarse grains, minor kaolinitic matrix, dolomitic cement, sandstone aggregates (as previously).
20% Siltstone and silty mudstone
10% Coal as above

8240-8250
70% Sandstone, as above, i), ii) and iii)
20% Siltstone, to silty mudstone
10% Coal

8250-8260
40% Sandstone, dominantly medium grey, very fine grains to fine grains, siltstone and occasionally fragments of medium to coarse grains, light grey sandstone with dolomitic cement
50% Siltstone and siltymudstone as above
10% Coal

8260-8270
70% Sandstone as above, types i), ii) and iii), mineral fluorescence, slight HC cut?
20% Siltstone as above and minor trace silty mudstone
10% Coal as above

8270-8280
60% Sandstone as above, i), ii) and iii), minor trace pyrite cement
30% Siltstone as above
10% Coal

8280-8290
50% Sandstone as above
30% Siltstone
20% Coal as above

8290-8300
30% Sandstone as above Trip
40% Siltstone-as above, silty mudstone
30% Coal as above

8300-8310
30% Sandstone, as above, siltstone as above
50% Siltstone and silty mudstone as above
20% Coal

8310-8320
50% Sandstone to siltstone as above
40% Siltstone and silty mudstone as above
10% Coal

8320-8330
50% Sandstone,mainly ver fine grain to fine grain, dirty sandstone, medium grey carbonaceous and micaceous - as above, occasional loose grains and aggregates as above.
40% Siltstone and silty mudstone as above
10% Coal as above
Sandstone with mineral fluorescence, No cut.

8330-8340
20% Sandstone as above
60% Siltstone and shale as above
20% Coal as above

8340-8350
20% Sandstone as above
40% Siltstone, silty mudstone
40% Coal as above

8350-8360
30% Sandstone
60% Siltstone, silty mudstone
10% Coal as above

8360-8370
30% Sandstone as above, siltstone as above
60% Siltstone as above
10% Coal

8370-8380
10% Sandstone
70% Siltstone to silty mudstone
20% Coal as above

8380-8390
40% Sandstone, light grey, fine to medium grain, dolomitic cement, kaolinitic matrix and very fine grain dirty sandstone to siltstone as above and occasional loose quartz sand grains as above
40% Siltstone, minor silty mudstone
20% Coal as above

8390-8400
70% Sandstone
80% Siltstone to silty mudstone, as above
Trace Coal

8400-8410
10% Sandstone
10% Siltstone and silty mudstone as above
80% Coal as above

8410-8420
10% Sandstone as above
60% Siltstone as above and silty shale, dark choc.brown grey, sub fissile to micaceous and carbonaceous
30% Coal as above

8420-8430
Trace sandstone (No cut)
90% Silty shale, chocolate brown grey, micro micaceous, very carbonaceous, as above
10% Coal as above

8430-8440

40% Sandstone, dominantly loose quartz sand grains, medium grain size, also sandstone aggregates, light grey to white with dolomitic cement as previously. Minor very fine grain to fine grain dirty grey sandstone as previously.
50% Silty shale to siltstone, dark brown grey, very carbonaceous, micaceous, as above.
10% Coal as above

8440-8450

70% Sandstone, dominantly loose quartz sand grains and sandstone aggregates, light grey, dolomitic cement as above, (fluorescent) occasional fragments of micro crystalline pyrite.
30% Silty shale to siltstone as above, siltstone to dirty sandstone as above
Trace Coal as above

8450-8460

90% Sandstone, i) loose grains as above, ii) aggregates as above and very fine grains dirty variety as above.
10% Siltstone, silty shale as above
Trace Coal as above

SNAPPER A-1

SAMPLE DESCRIPTIONS

8600 - 8610	70% Sandstone, loose grains of aggregates as above. 30% Siltstone, as above Trace Coal.
8610 - 8620	Gas show 50% Sandstone, largely aggregates, 8615 - 8620, light grey, permeable, dolomitic, as above. Mineral fluorescence 40% Siltstone, as above to silty mudstone 10% Coal
8620 - 8630	20% Sandstone 70% Siltstone to silty shale, as above 10% Coal
8630 - 8640	70% Sandstone (i) Aggregates, light grey and grey, very fine grained-medium grained, carbonaceous, permeable matrix, occasional lithic grains as above. (ii) Loose quartz sand grains, medium-very coarse grained angular-rounded, no cut. 30% Siltstone, dark brown grey-brown grey, very carbonaceous, coal tied plant remains, micaceous in part to silty mudstone. Trace Coal as above.
8640 - 8650	80% Sandstone, dominantly aggregates as above. Mineral fluorescence, very slight cut associated with coarse shaly fragments or very fine grained sandstone which contained carbonaceous material. 20% Shale-Siltstone, as above
8650 - 8660	50% Sandstone (i) Aggregates as above (ii) Loose quartz sand grains as above. Trace pyrite. 40% Siltstone - Shale as above Trace pyrite 10% Coal
8660 - 8670	50% Sandstone (i) and (ii) as above (iii) Minor sandstone, medium grey-medium grey brown, very fine-fine grained, carbonaceous, mica-siltstone in part. 40% Siltstone as above 10% Coal as above Gas show H.W. 320
8670 - 8680	20% Sandstone mainly (i) and (iii) as above. 70% Siltstone as above 10% Coal as above, black, brittle, conchoidal fracture - anthracitic. Gas show H.W. 60
8680 - 8690	100% Puggy Silty Clay, grey-light grey, very soft, carbonaceous, contains abundant carbonaceous flecks and grains, very fine-fine sand grains. Trace Silstone as above Trace Coal as above. Gas Show.

8690 - 8700

100% Sandstone, loose quartz sand grains, coarse-very coarse as above and sandstone aggregates as above.
Trace siltstone as above.
Trace coal.
Gas Show H.W. 300 Units at 95'

8700 - 8710

80% Sandstone, loose quartz sand grains to very coarse grained-mucky clay globs of sand grains, carbonaceous grains and siltstone fragments - may indicate a soft sand with abundant clay matrix.
20% Siltstone, as above
Trace Coal as above

8710 - 8720

60% Sandstone, mainly sandstone aggregates, light grey dominant. medium grained as previously. Mineral fluorescence. carbonaceous, lithic fragments, kaolinitic matrix as above.
30% Siltstone as above.
10% Coal as above

Trip at 8739

8720 - 8730

90% Shale, dark brown, very carbonaceous, occasional bleeding gas.
10% Sandstone, white, very fine-fine grained aggregate, carbonaceous, white clay matrix, poor porosity and permeability,,occasional coarse loose quartz grains.
Trace Siltstone
Trace Coal.

8730 - 8740

30% Sandstone, white to light grey, very fine-medium grained aggregate, moderate sorting, subangular-subrounded, firm, carbonaceous and coal laminae, slightly dolomitic, white clay matrix, trace pyrite, occasional grey chert grains. Poor porosity and permeability, no fluorescence.
10% Siltstone, grey to brown, argillaceous, sandy in part, carbonaceous laminae.
Trace Coal.
60% Shale, dark brown, carbonaceous, plant fragments, micaceous, soft to firm, silty.

8740 - 8750

20% Sandstone, as above
20% Shale as above, silty and carbonaceous
60% Siltstone, brown to grey brown, argillaceous, sandy in part, carbonaceous and coaly laminae and inclusions, grades from silty shale through shaly siltstone to very fine grained sandstone.

8750 - 8760

20% Sandstone, light grey, very fine-fine grained.
10% Shale, as above
70% Siltstone as above
Trace pyrite.

8760 - 8770

50% Sandstone, white to light grey, very fine-medium grained, subangular-subrounded, moderate sorting, trace pyrite, white clay matrix, poor porosity and permeability. Pale yellow fluorescence, pale milky cut.
10% Shale, as above
40% Siltstone, as above.
Trace Coal.
Gas Show 8760 - 8770. Maximum hot wire 210

8770 - 8780

20% Sandstone, white to light grey, very fine-fine grained aggregate, moderate sorting, subangular-subrounded, trace pyrite, coal inclusions and laminae, slightly dolomitic white clay matrix, poor porosity and permeability, yellow fluorescence
10% Shale, brown to dark brown, micaceous, silty, carbonaceous
70% Siltstone, brown to grey brown, argillaceous, carbonaceous and coaly, laminated in part. Trace Coal.

8780 - 8790
10% Coal, black, hard, conchoidal fracture, bleeding gas.
10% Shale, pale brown to brown, coal laminae, firm
10% Sandstone, as above
70% Siltstone, as above
Gas show about 8800 - associated with drilling break.
8795 - 8805 Maximum Hot Wire 230

8790 - 8800
10% Coal
40% Sandstone as above. Trace yellow fluorescence, occasional coarse loose quartz grains.
50% Siltstone as above.

8800 - 8810
10% Coal bleeding gas
40% Sandstone as above, pale yellow fluorescence, some gives pale milky cut, some doesn't appear to cut.
50% Siltstone as above, grades into very fine sandstone

8810 - 8820
20% Coal
10% Shale, dark brown carbonaceous.
30% Sandstone, as above, very fine-fine grained, coal laminae pale yellow fluorescence.
40% Siltstone as above

8820 - 8830
Gas show 8828 Max Hot Wire 90
10% Sandstone as above
90% Shale, dark brown-dark brown black, very carbonaceous and coaly, silty in part, bleeding gas

Gas show 8840 - Fast drilling 8840 - 8860 max Hot Wire 300

8830 - 8840
10% Coal, black, hard, brittle, conchoidal fracture
20% Sandstone, white, very fine-fine grained, aggregate with some silt size, quartzose, moderate sorting, angular-subrounded, white clay matrix, poor porosity and permeability, some pale blue yellow fluorescence.
10% Shale, pale brown to dark brown, carbonaceous and coaly.
60% Siltstone, brown to grey to dark grey brown, argillaceous, coaly and carbonaceous.

8840 - 8850
20% Coal
20% Shale, dark brown, coaly and carbonaceous
30% Sandstone, white, very fine grained-coarse grained, aggregate, fair sorting, angular-subrounded, trace dolomite, trace pyrite, white clay matrix, poor porosity and permeability, trace pale yellow fluorescence, trace pale milky cut from some cuttings, mineral fluorescence?
30% Siltstone, light grey to brown to brown grey, argillaceous coaly and carbonaceous in part, grades up to very fine. grained sandstone.

8850 - 8860
10% Coal
30% Sandstone, very fine-medium grained aggregate, some coarse loose quartz grains, minor pale yellow mineral(?) fluorescence.
10% Shale as above
50% Siltstone, white to light grey to dark grey to brown grey.
Trace pyrite as above.

8860 - 8870
Still in gas show.
10% Coal, trace pyrite.
10% Shale, dark brown-dark brown grey as above
40% Sandstone, white, very fine-coarse grained aggregate. fair sorting angular-subrounded dolomitic cement, trace pyrite, coal laminae, white clay matrix, poor porosity and permiability, pale yellow fluorescence (mineral), no apparent cut.
40% Siltstone as above

8870 - 8880

10% Coal
20% Shale, brown to dark brown
40% Sandstone, very fine grained-coarse grained aggregate
30% Siltstone, light grey to brown grey to dark grey as above

8880 - 8890

Trace Coal
30% Sandstone, white very fine-medium grained, grades up from siltstone as above, yellow mineral fluorescence.
10% Shale, brown to dark brown, carbonaceous.
60% Siltstone, light grey to dark brown grey, argillaceous, sandy, carbonaceous, trace pyrite.

8890 - 8900

10% Coal
20% Shale, brown to dark brown, coaly a nd carbonaceous plant fragments.
40% Siltstone, brown to brown grey, micaceous, argillaceous and carbonaceous.
30% Sandstone, white, fine-coarse grained, quartzose, angular-subrounded, fair sorting, white clay matrix, dolomitic cement, poor porosity and permeability, trace yellow mineral fluorescence.

Trip at 8929

8900 - 8910

No cuttings over shaker

8910 - 8920

10% Coal
20% Shale, brown to dark brown, carbonaceous and coaly, plant imprints, micaceous.
20% Siltstone, grey to dark brown grey, argillaceous, carbonaceous and silty.
50% Sandstone, white to light grey aggregate and clear to white loose grains, very fine-medium grained aggregate, medium-very coarse grained loose quartz, moderate sorting, angular-subrounded, trace pyrite, white clay matrix, poor porosity and permeability, minor yellow mineral fluorescence.

8920 - 8930

Trace Coal
20% Shale as above
20% Siltstone as above
60% Sandstone, white aggregate, very fine-very coarse grained fair sorting, angular-subrounded, trace pyrite, coal inclusions, dolomitic cement. Trace chert, white clay matrix, poor porosity and permeability, blue yellow fluorescence, milky cut from some cuttings.

8930 - 8940

Trace Coal
10% Shale, brown to dark brown, firm, coaly and carbonaceous, silty in part, plant fragments.
20% Siltstone, grey to brown grey, argillaceous and sandy, trace pyrite, coal and carbonaceous laminae.
70% Sandstone, white to light grey, fine-very coarse grey, quartzose, aggregate and some loose grains, coal and carbonaceous inclusions, fair sorting, angular-subrounded. Slightly dolomitic, trace pyrite, white clay matrix, poor porosity and permeability, trace yellow mineral fluorescence, no cut.

8940 - 8950

80% Sandstone, clear to white, medium-very coarse, loose quartz grains, very fine-medium grained white aggregate dominantly medium-coarse grained, fair sorting, angular-subrounded, trace grey chert, pyritic nodules, slightly dolomitic, white clay matrix, poor porosity and permeability, trace yellow mineral fluorescence, no cut.
40% Siltstone, as above
10% Shale as above

8950 - 8960
20% Coal, bleeding gas
20% Shale as above.
20% Sandstone, very fine-coarse grained aggregate as above
40% Siltstone as above

8960 - 8970
10% Coal
10% Shale
20% Sandstone, very fine-coarse grained aggregate as above
60% Siltstone, as above

Gas show coming in 8972
Corresponds to faster drilling rate. Max H.W. 300

8970 - 8980
Trace Coal.
20% Shale, dark brown, very carbonaceous, silty in part
30% Sandstone, very fine-coarse grained aggregate with some loose quartz grains, trace mineral fluorescence
50% Siltstone as above

8980 - 8990
Trace Coal
10% Shale, dark brown, coaly and carbonaceous laminae
30% Siltstone as above
60% Sandstone as above, very fine-coarse grained, pyritic, tight, poor to fair sorting, trace mineral fluorescence.

8990 - 9000
10% Carbonaceous shale and coal
Trace Siltstone, as above.
90% Sandstone, white, fine-coarse grained, dominantly medium grained, quartzose, angular-subrounded, good sorting, pyritic, trace grey chert, coal and carbonaceous inclusions, white clay matrix, trace dolomitic cement, poor porosity and perméability.
Low gas readings, trace mineral fluorescence.

9000 - 9010
80% Sandstone, white, very fine-medium grained aggregate, dominantly fine grained, quartzose, angular-subrounded, moderately godd sorting, pyritic, white clay matrix, dolomitic cement, poor porosity and permeability.
10% Carbonaceous shale and coal.
10% Siltstone, dark brown grey, argillaceous, coaly and carbonaceous, sandy in part.

Trip at 9019

9010 - 9020
50% Sandstone, mainly very fine-medium grained with some coarse grained, trace mineral fluorescence as above.
10% Coal
20% Shale, brown to dark brown, coal and carbonaceous laminae, silty in part.
20% Siltstone, as above

9020 - 9030
50% Sandstone, white, very fine-coarse grained aggregate, quartzose, angular-subrounded, fair sorting, pyritic, coal laminae and inclusions, trace chert, dolomitic cement, white clay matrix, poor porosity and permeability, mindral fluorescence
20% Shale, brown to dark brown, carbonaceous and coaly.
30% Siltstone, brown to brown grey, argillaceous, carbonaceous and coaly.

9030 - 9040
10% Coal, black, hard, brittle, conchoidal fracture, bleeding gas.
20% Shale, brown to dark brown grey, coal and carbonaceous laminae, silty in part.
30% Siltstone, light grey to brown grey, argillaceous, coal and carbonaceous laminae, micaceous.
40% Sandstone, white to light grey, very fine-coarse grained as above

Gas kick 9045. H.W. Max 240. Coal and carbonaceous shale bleeding gas.

9040 - 9050

10% Siltstone as above
Trace Sandstone.
90% Carbonaceous shale and coal
Shale: dark brown black, very coaly and carbonaceous, bleeding gas.

9050 - 9060

20% Sandstone, white, very fine-very coarse grained aggregate as previously.
20% Siltstone, grey to brown to brown grey as previously.
60% Carbonaceous Shale and Coal.

9060 - 9070

30% Sandstone, very fine-medium grained, spotty yellow fluorescence, no cut to pale milky cut - mineral fluorescence?
10% Coal
10% Carbonaceous shale
50% Siltstone, brown to brown grey, argillaceous, carbonaceous and coal laminae and inclusions.

Gas kick - 9078 Max H.W. 140
of short duration. Coal and carbonaceous shale.

9070 - 9080

Trace Sandstone, very fine-medium grained, spotty yellow fluorescence - mineral.
50% Coal, bleeding gas.
20% Shale, dark brown black, very carbonaceous
30% Siltstone, brown to brown grey as above

9080 - 9090

10% Coal
20% Siltstone as above
70% Sandstone, white, very fine-medium grained, quartzose with trace chert and lithics, pyritic, angular-subrounded, fair sorting, dolomitic, white clay matrix, coal and carbonaceous inclusions, and laminae, poor porosity and permeability, spotty yellow fluorescence, milky cut.

Gas kick - 9092. Max H.W. 160 Sand, short duration.
Gas kick - 9100 Max H.W. 120 " short duration

9090 - 9100

90% Sandstone, white, very fine-medium grained aggregate with a few fractured coarse-very coarse loose quartz grains, angular-subrounded, fair sorting, pyritic, quartzose with trace chert and lithics, slightly dolomitic, white clay matrix, poor porosity and permeability, yellow fluorescence. No apparent cut.
10% Carbonaceous shale and Coal.

9100 - 9110

40% Sandstone, white, very fine-coarse grained, quartzose, angular-subrounded, fair sorting, pyritic, white clay matrix, poor porosity and permeability, trace chert and lithics.
30% Shale, dark brown and dark brown grey, carbonaceous and coaly, micaceous.
30% Silts tone, brown grey, argillaceous, carbonaceous.

9110 - 9120

40% Sandstone as above
20% Shale, light grey-brown grey, carbonaceous.
40% Siltstone, grey to brown grey.

Gas Kick, 9124. Max H.W. 120 Coal and carbonaceous shale.
Short duration.

9120 - 9130

20% Sandstone as above
20% Coal as above
40% Shale dark brown grey, micaceous, carbonaceous and coaly, bleeding gas
20% Siltstone, brown grey, argillaceous, carbonaceous, sandy in part, pyritic.

9130 - 9140

Trace Coal
Trace carbonaceous shale.
60% Siltstone, brown grey, argillaceous, coal and carbonaceous inclusions and laminae, pyritic, micaceous.
40% Sandstone, very fine-medium grained white aggregate, coal and carbonaceous laminae, quartzose with trace lithics, angular-subrounded, pyritic, slightly dolomitic, white clay matrix, poor porosity and permeability, Yellow mineral fluorescence.

9140 - 9150

Trace Coal and Carbonaceous shale.
50% Siltstone as above
50% Sandstone, very fine-medium grained, as above

Gas kick 9155 Max. H.W. 500. Short duration.
Some fluoresence, fair cut, also mineral fluorescence.
Some brown HC stain (?) some grains float on acid

9150 - 9160

40% Sandstone as above, fine-medium grained, yellow fluorescence, faint cut, possible HC stain.
10% Coal and carbonaceous shale.
50% Siltstone, as above

9160 - 9170

30% Sandstone, fine-coarse grained
Yellow fluorescence, fair cut.
70% Siltstone as above
Gas Kick from 9176 H.W. 300 units
Persistant gas show.

9170 - 9180

10% Coal, black, hard, brittle, conchoidal fracture, bleeding gas.
40% Siltstone, grey to brown grey.
50% Sandstone, white, very fine-medium grained, quartzose, angular-subrounded, fair sorting, dolomitic, pyritic, white clay matrix, coal inclusions, and laminae, poor porosity and permeability, yellow fluorescence, good cut, possible staining.

9180 - 9190

10% Shale, brown to brown grey, carbonaceous
40% Sandstone, very fine-medium grained, silty in part, brown staining, 2 types fluorescence, yellow mineral, golden Faint cut.
Poor porosity and permeability.
50% Siltstone as above, brown to brown grey

9190 - 9200

20% Coal, bleeding gas
30% Sandstone, very fine-coarse grained, dolomitic, poor permeability and porosity, yellow fluorescence, faint cut, possible stain.
50% Siltstone, brown to brown grey, argillaceous, micaceous, carbonaceous and coaly.

9200 - 9210

20% Coal as above
30% Shale, carbonaceous as above, pyritic in part.
40% Sandstone as above, very fine-medium grained, aggregate silty in part, yellow fluorescence, some coarse grained.
40% Siltstone as above

9210 - 9220

20% Coal, bleeding gas.
30% Shale, brown to brown grey, carbonaceous.
10% Siltstone, grey to brown to brown grey, as above.
40% Sandstone, very fine-medium grained, silty.
Fluorescence.

9220 - 9230

20% Coal, black, hard, conchoidal fracture, bleeding gas.
30% Shale, brown to brown grey, firm, carbonaceous, coalified plant fragments.
20% Siltstone, grey to brown grey, argillaceous, coal laminae and inclusions, pyritic, micaceous.
30% Sandstone, white, very fine-medium grained, dominantly fine grained, quartzose, angular-subrounded, good sorting, pyritic, silty dolomitic cement, white clay matrix, poor porosity and permeability, pale yellow fluorescence, faint cut.

9230 - 9240

10% Coal as above
10% Shale, brown to brown grey
40% Siltstone, light grey to brown to brown grey
40% Sandstone as above
2 types fluorescence - dull yellow
- bright yellow

Core No. 26 9241 - 9259
See Core Description

Core No. 27 9259 - 9290
See Core Description

9290 - 9300

70% Sandstone, white and firm, fine-medium grained, quartzose with trace lithics, trace pyrite, slightly dolomitic, angular-subrounded, fair-moderate sorting, clay matrix, poor porosity and permeability, some mineral fluorescence, also some grains show bright yellow fluorescence, good cut.
30% Siltstone, brown grey, argillaceous, carbonaceous, trace pyrite.
Trace Coal.

9300 - 9310

70% Sandstone, white, quartzose with trace lithics, fine-coarse grained, angular-subrounded, fair sorting, trace pyrite, white clay matrix, slightly dolomitic, poor porosity and permeability, bright yellow fluorescence, good cut.
Trace Coal.
30% Siltstone, brown to brown grey, argillaceous, carboniferous and coaly, grades up to very fine grained sandstone, micaceous.

9310 - 9320

40% Sandstone, white fine-medium grained aggregate, coarse to very coarse grained, loose, clear to frosted quartz grains, poor sorting, subangular-subrounded, trace pyrite, aggregate has clay matrix and poor porosity and permeability, carbonaceous laminae associated with some of aggregate, bright yellow fluorescence, good cut.
10% Shale, brown grey, micaceous, slightly silty in part, carbonaceous, plant imprints.
30% Siltstone, light grey to brown grey, argillaceous, carbonaceous.
Trace Coal.

9320 - 9330

70% Sandstone, very fine-coarse grained aggregate and loose quartz grains, fair sorting, quartzose, subangular-subrounded, pyritic, aggregate, slightly dolomitic, white clay matrix, poor porosity and permeability, bright yellow fluorescence, good cut.
Trace Coal.
Trace Shale, brown-brown grey, carbonaceous, plant imprints, micaceous.
30% Siltstone, brown grey, carbonaceous, micaceous, argillaceous

SNAPPER A-1

Core No. 26

9241 - 9259

Cut 18'
Rec 16'

Source Rock sample 9258

Palynology Sample 9258

Reservoir Engineering Plug 9247

10 samples for porosity and permeability determination -

9242, 9243, 9244, 9245, 9246, 9247,
9248, 9249, 9250, 9251.

SNAPPER A-1

Core No. 27
9259 - 9290
Cut 31'
Rec 31'

Reservoir Samples	9269' 9277'
Source Sample	9260
Palynology Sample	9260

Porosity and Permeability Samples -

9264, 9265, 9266, 9267, 9268, 9269, 9270, 9271, 9272, 9273, 9274, 9275, 9276, 9277, 9278, 9279

and

9285, 9286, 9287, 9288, 9289, 9290

9330 - 9340 60% Sandstone as above, bright yellow fluorescence, fair cut.
Trace Coal.
40% Siltstone, brown to brown grey, argillaceous, carbonaceous, micaceous.

Gas Kick started about 9344 - 9357 Max. H.W. 500

9340 - 9350 50% Sandstone, white, medium-very coarse grained, aggregate coarse-very coarse grained, loose, clear to frosted quartz grains, poor to fair sorting, angular-subrounded, quartzose with trace lithics, pyritic, slightly dolomitic, white clay matrix, poor porosity and permeability, scattered yellow fluorescence, no apparent cut to faint cut, majority is mineral fluorescence.
40% Siltstone, light grey to brown to brown grey, argillaceous, carbonaceous, micaceous, pyritic.
10% Coal, black, hard, brittle, conchoidal fracture, bleeding gas,

9350 - 9360 60% Sandstone, white, fine-very coarse grained, mainly aggregate with some loose quartz grains, quartzose with trace lithics, subangular-subrounded, fair sorting, trace pyrite, white clay matrix, dolomitic cement, poor porosity and permeability, some yellow fluorescence, most have no apparent cut, some cut, probably mainly mineral fluorescence.
40% Siltstone as above
Trace Coal.

9360 - 9370 70% Sandstone, fine-coarse grained aggregate, some is quite coaly and carbonaceous as above.
Some yellow fluorescence, good cut.
30% Siltstone as above
Trace Coal.

SNAPPER A-1

9370 T.D.	Casing at 9316'
9370 - 9380	95% Cement 5% Sandstone, quartz, wacke, predominantly very fine-fine grained, moderately sorted with abundant scattered flecks of carbonaceous material. Occasional medium grained moderately sorted, subangular, quartz in an abundant white clay matrix, crumbly. Has brown colour - maybe oil staining. Gold coloured fluorescence - patchy to pinpoint. Slight cut leaving ring. Tight, low porosity and permeability. Trace coal.
9380 - 9390	As above
9390 - 9400	80% Cement 20% Sandstone, as fine-medium aggregates and as loose coarse-very coarse, subangular grains. Fine sands are white to buff with thin laminae of carbonaceous material and a white clay matrix. Trace coal and abundant shale - brown.
9400 - 9410	80% Cement, 20% Sandstone, light grey, silty, fine-medium grained, moderate-poor sorting, abundant scattered carbonaceous fragments and mica. Scattered fluorescence, light yellow orange, no cut. Trace carbonaceous shale and coal.
9410 - 9420	20% Cement 80% Sandstone, predominantly fine, silty aggregates and as loose coarse-very coarse grains, slightly pyritic in part. Trace siltstone and coal. No fluorescence - cut.
9420 - 9430	60% Cement 20% Loose quartz grains, as very coarse, subangular, clear to milky. 20% Sandstone aggregates, light grey to white, fine-medium grained, slightly silty in part, scattered abundant flecks. Trace carbonaceous shale fragments. No fluorescence - mineral only.
9430 - 9440	70% loose quartz grains, coarse-very coarse, clay adhering to edges. 20% Sandstone aggregates, light grey-brown, fine-medium, subangular, abundant clay matrix. Flecks of carbonaceous material. 10% Cement Trace shale and carbonaceous material Strong yellow green fluorescence - weak to medium cut.
9440 - 9450	40% Shale, light brown carbonaceous mica, bleeding gas 30% loose quartz grains, coarse-very coarse. 30% aggregates of Sandstone, fine-medium, light grey, poor-moderately sorted, abundant clay matrix, friable. Good light yellow-green gold fluorescence, weak cut, some aggregates had streaming cut.

9450 - 9460
60% Cement
20% Sandstone, loose grains and aggregates as above.
20% Shale, carbonaceous, light brown, fissile and coal.
Fluorescence, no cut (probably from cavings).

9460 - 9470
80% Coal, Siltstone, carbonaceous Shale, silty sandstone.
Predominantly coal and carbonaceous shale and siltstone.
10% Cement
10% Loose quartz grains.
Scattered yellow fluorescence, weak cut.

9470 - 9480
20% Cement
80% Coal, carbonaceous shale and silty shale.
Trace loose quartz grains.
Drilling break (no show)

9480 - 9490
20% Cement
60% Sandstone, very silty, aggregates fine grained, light brown and grey, abundant clay matrix and carbonaceous flecks, pyritic.
20% Coal and carbonaceous shale.

9490 - 9500
20% Cement
60% Coal and Silty Sandstone, aggregates as above.
porosity and permeability poor, scattered fluorescence.
20% Carbonaceous Shale fragments
Occasional loose quartz grains.
Gas Kick

9500 - 9510
80% Cement
10% Carbonaceous Shale and Coal
10% Silty Sandstone, as above

9510 - 9520
40% Cement
20% loose quartz grains, coarse, subangular
30% Coal and Silty Shale
10% Sandstone aggregates, fine-medium, occasional very silty, abundant carbonaceous fragments.
Low porosity and permeability. No fluorescence.

9520 - 9530
50% Cement
20% Sandstone, aggregates and loose grains as above.
30% Coal and silty carbonaceous shale, as above.
Patchy fluorescence, light yellow-blue.

9530 - 9540
20% Cement
50% Sandstone, loose quartz grains and aggregates
20% Coal and carbonaceous shale.
10% Siltstone

9540 - 9550
90% Sandstone, loose quartz grains, coarse-very coarse, subangular, milky-clear. Few aggregates
10% Shale and Coal, Cement
Scattered light yellow-white fluorescence, very weak cut,
Good porosity and permeability?.

9550 - 9560
90% Sandstone, predominantly loose quartz grains, coarse-very coarse, subangular grains, milky and clear. Few aggregates.
Scattered light blue-white fluorescence, very weak to no cut. Good porosity and permeability.
10% Coal and silty carbonaceous Shale, as above

9560 - 9570
90% Unconsolidated, coarse-very coarse, subangular-angular, quartz grains, as above. Rare Aggregates.
Scattered white-blue fluorescence - no cut.
10% Coal and carbonaceous shale and cement

9570 - 9580
100% loose quartz grains, as above.
Trace Coal, carbonaceous Shale.
Scattered fluorescence, less than above.

9580 - 9590 — 100% loose quartz grains, as above.
Rare scattered fluorescence, no cut.
Trace carbonaceous shale.

9590 - 9600 — 90% loose quartz grains, as above.
Rare scattered fluorescence.
10% Shale and coal, siltstone.

9600 - 9610 — 90% loose quartz grains, as above.
10% Coal and minor shale and siltstone.

9610 - 9620 — 30% loose quartz grains.
60% Coal and carbonaceous shale
10% Siltstone and silty sandstone.

9620 - 9630 — 20% loose quartz grains
40% Sandstone, very fine and silty, white to light brown, abundant clay matrix and carbonaceous fragments.
40% Coal and carbonaceous shale fragments.

9630 - 9640 — 60% Sandstone, white-light grey, very fine to fine, slightly silty, laminated with carbonaceous remains and shale. Poor porosity and permeability.
20% Shale and Coal
20% Loose quartz grains, coarse-very coarse, subangular, milky-clear.

9640 - 9650 — 70% Sandstone, loose grains, as above.
20% Sandstone, aggregates thickly laminated
10% Coal

Trip 9661

9650 - 9660 — 50% Cement
20% Shale and Coal
30% Sandstone aggregates and loose grains

9660 - 9670 — 80% Sandstone, equal amounts of fine-very fine, silty, and fine-medium quartz aggregates with abundant clay matrix, scattered carbonaceous flecks and mica and pyrite.
Porosity and permeability low. No fluorescence.
Abundant loose coarse-very coarse, subangular, quartz grains.
20% Shale and Coal, chocolate brown.

9670 - 9680 — 80% Sandstone, as above
10% Coal, bleeding gas
10% Shale
Sandstone aggregates interbedded with shale and coal.

9680 - 9690 — 50% Sandstone, very fine grained, silty aggregates, light grey-brown, very argillaceous.
50% Shale and Coal

9690 - 9700 — 90% Coal and carbonaceous shale, micaceous, dark brown, bleeding gas.
10% Sandstone aggregates as above.

9700 - 9710 — 60% Coal
30% Carbonaceous, micaceous Shale, silty, in part, laminated.
10% Sandstone.

9710 - 9720 — 30% Coal
30% Carbonaceous Shale
30% Siltstone, light brown, very argillaceous, micaceous, carbonaceous, thinly laminated.
20% Sandstone, very fine-medium grained

9720 - 9730 — 30% Coal
50% Sandstone, light grey-white, fine-medium grained aggregates, abundant clay matrix, silty in part, poor porosity and permeability, no fluorescence.
10% Carbonaceous Shale and Siltstone.

9730 - 9740 100% Coal (30%) and Silty carbonaceous shale (70%) fossile, laminated, dark brown to black, slightly micaceous, slightly bleeding gas
Trace Sandstone aggregates.
No show.

9740 - 9750 80% Silty, carbonaceous, shale, as above.
20% Coal

9750 - 9760 40% Coal
60% Carbonaceous, silty shale, as above.
Trace Sandstone, fine-medium grained aggregates.

9760 - 9770 30% Coal
60% Shale, carbonaceous
10% Sandstone, aggregates light brown-grey, fine-medium grained, moderately sorted, abundant clay matrix, scattered carbonaceous flecks and laminae.
No show.

9770 - 9780 20% Coal
70% Shale, dark grey and brown, as above.
10% Sandstone, as above

9780 - 9790 10% Coal
80% Shale, dark grey and brown, as above.
10% Sandstone, as above, loose grains.

9790 - 9800 20% Coal
80% Shale, silty
Trace Sandstone, fine-medium grained.

9800 - 9810 10% Coal
50% Shale, as above
40% Siltstone, light brown, carbonaceous, argillaceous, crumbly

9810 - 9820 10% Coal
50% Shale, as above
40% Siltstone, as above

9820 - 9830 20% Coal
40% Siltstone, dark-medium grey, carbonaceous, argillaceous
40% Shale, slightly silty
Trace Sandstone.

9830 - 9840 20% Coal
20% Shale, carbonaceous, dark brown-grey.
50% Siltstone, dark brown, argillaceous, very finely sandy in part carbonaceous.
10% Sandstone, very fine-fine, argillaceous, carbonaceous, No porosity and permeability.
No show.

9840 - 9850 20% Coal
20% Shale, dark brown-grey, bleeding gas, carbonaceous, as above.
30% Siltstone, dark brown, slightly sandy, carbonaceous, argillaceous, laminated.
30% Sandstone, very fine grained, silty, argillaceous, carbonaceous, poor porosity and permeability, no fluorescence.

9850 - 9860 30% Coal
30% Shale, very carbonaceous, dark brown and grey, laminated silty
30% Siltstone, dark brown generally, occasional dark grey, very carbonaceous, argillaceous.
10% Sandstone, very fine-fine silty.

(interbedded Coal, Shale, and Siltstone, minor Sandstone).

9860 - 9870 80% Sandstone, quartz and lithic wacke, medium-fine grained, subangular quartz, illsorted, abundant lithic fragments and rare feldspar. Dolomitic cement, very tight, no porosity and permeability. Yellow mineral fluorescence.

9870 - 9880 Depth Correction.

Core No. 28 9882 - 9903 Rec. 21'

9900 - 9910
40% Shale, as above - trip sample not indicative
30% Coal
20% Siltstone, dark grey-brown
10% Sandstone

9910 - 9920 Drilled very fast 2.5 minutes per foot.

50% Shale, as above
10% Coal
30% Sandstone, fine-medium grained, some aggregates very fine-fine, occasional loose coarse-very coarse, subangular, quartz grains. Some have strong light blue fluorescence and immediate light blue streaming cut.
10% Siltstone, as above

9920 - 9930
10% Coal
40% Shale, as above
30% Siltstone
30% Sandstone, as above. Strong light yellow green fluorescence in some of the aggregates, slow light blue cut.

9930 - 9940
10% Coal
30% Shale
20% Siltstone
40% Sandstone, aggregates as above. Large number of loose coarse-very coarse, subangular, quartz grains with brown oil staining, light blue fluorescence and immediate streaming cut.
No drilling break associated with sand, assuming cavings.
Also no gas kick whatsoever.

9940 - 9950
10% Coal
50% Shale, as above
20% Siltstone, as above
20% Sandstone aggregates with light yellow-green fluorescence.

9950 - 9960
Trace Coal
50% Shale, carbonaceous, slightly silty, as above.
30% Siltstone, as above
10% Sandstone, aggregates fine-medium, as above.

9960 - 9970
Trace Coal
70% Shale, slightly silty, carbonaceous, as above.
20% Siltstone
10% Sandstone, aggregates have fluorescence and cut and an occasional loose very coarse-coarse quartz grain.

Trip.

9970 - 9980
Trip Sample
Trace Coal
40% Shale, dark grey and brown, carbonaceous, as above.
30% Siltstone.
20% Sandstone, aggregates with light blue fluorescence

9980 - 9990 Trace Coal
40% Shale, silty
20% Siltstone, very argillaceous, very fine-sandy
40% Sandstone, aggregates from silty, very fine-fine - silty, fine-coarse. Some aggregates have strong light blue fluorescence and show light yellow and blue cut.

9990 - 10,000 10% Coal
60% Shale, as above
20% Siltstone
10% Sandstone, as above

10,000 - 10,010 10% Coal
50% Shale, as above
20% Siltstone, as above
20% Sandstone, as above, associated loose, coarse, subangular, quartz grains

10,010 - 10,020 Trace Coal
40% Shale, as above
20% Siltstone
40% Sandstone, predominantly fine-medium grained, subangular, quartz, moderate-poorly sorted, silty in part, many thinly laminated with silty shale. Abundant clay matrix and sporadic dolomitic cement. Light blue and yellow fluorescence. Slow cut. (Some fluorescence is mineral)

140 unit gas kick (may have been thin coal)

10,020 - 10,030 Trace Coal
60% Shale and Silty Shale
20% Siltstone
20% Sandstone, as above

10,030 - 10,040 Trace Coal
50% Shale, as above
20% Siltstone
30% Sandstone

10,040 - 10,050 Trace Coal
70% Shale, as above
20% Siltstone, as above
10% Sandstone, as above, aggregates and a few loose grains light blue yellow fluorescence, slow cut, some staining.

10,050 - 10,060 10% Coal
80% Shale and Silty Shale
10% Sandstone, as above

Trip.

10,060-10,070 Tr. Coal
40% Shale, as above.
40% Siltstone, as above.
20% Sandstone, as above, very little fluorescence.
(Associated with 80 unit gas kick. Gas dropped away immediately.)
(62 unit trip gas)

10,070-10,080 Tr. Coal
30% Shale, silty, interbedeed, thin laminae.
50% Siltstone
20% Sandstone, as above, very little fluorescence.

10,080-10,090 Tr. Coal
20% Shale, as above.
10% Siltstone
70% Sandstone, loose grains, coarse to very coarse with quartz grains. Some have a dull yellow-green fluorescence with a slight yellow-light blue cut.

220 unit gas kick.
Good sand probably on 5'-10' thick.

10,090-10,100
Tr. Coal
40% Shale, as above,
40% Siltstone, as above.
20% Sandstone, as above.

10,100-10,110
Tr. Coal
40% Shale, as above.
40% Siltstone, as above.
20% Sandstone, as above.

10,110-10,120
Tr. Coal
30% Shale, as above.
50% Siltstone, as above.
20% Sandstone, as above.

10,120-10,130
Tr. Coal
40% Shale, dark brown-grey, silty-hard.
50% Siltstone, light-dark brown, argillaceous, very fine, sandy.
10% Sandstone, loose

10,130-10,140
Tr. Coal
30% Shale as above
50% Siltstone, as above.
20% Sandstone, as above.

10,140-10,150
10% Coal - associated 40 unit gas kick.
40% Shale, as above.
40% Siltstone, as above.
10% Sandstone, aggregates fine-medium occasional loose very coarse quartz grains.
Some light blue fluorescence with very slow cut.

10,150-10,160
20% Coal
30% Shale, as above.
40% Siltstone, as above.
10% Sandstone, as above.

10,160-10,170
10% Coal
30% Shale, as above
50% Siltstone, as above.
10% Sandstone, as above.

Trip N.B. - locked bit 10,177'

10,170-10,180
20% Coal
60% Shale
10% Siltstone
10% Sandstone

10,180-10,190
20% Coal, argillaceous, brittle.
60% Shale, dark brown-grey, very carbonaceous, silty, hard.
20% Siltstone, brown, argillaceous.
Tr. Sandstone

10,190-10,200
10% Coal
60% Shale, as above
30% Siltstone, as above.
Tr. Sandstone

10,200-10,210
Tr. Coal
60% Shale, as above.
30% Siltstone, as above.
10% Sandstone

10,210-10,220
10% Coal
60% Shale, as above.
20% Siltstone, as above.
10% Sandstone, as above.

10,220-10,230
10% Coal
60% Shale, as above.
20% Siltstone, as above.
10% Sandstone, as above.

10230-10240
Tr. Coal
40% Shale, as above.
50% Siltstone, as above.
10% Sandstone, as above.

10,240-10,250
20% Coal
40% Shale, as above.
30% Siltstone, as above.
10% Sandstone, as above.

10,250-10,260
Tr. Coal - small drilling break.
20% Shale
30% Siltstone
50% Sandstone, buff light brown, fine to medium grained aggregates mod.-sorted, clay matrix, abundant lithics, firm, dolomite cement. Dull yellow mineral fluorescence.

10,260-10,270
Tr. Coal
40% Shale, as above.
50% Siltstone
10% Sandstone, as above.

10,270-10,280
Tr. Coal
20% Shale, as above.
60% Siltstone, as above.
20% Sandstone, as above.

10,280-10,290
Tr. Coal (has a jump in the gas readings)
50% Shale, very carbonaceous, bleeding gas.
30% Siltstone
20% Sandstone, fine to medium grained, sub-angular, aggregates, tight, hard, no fluorescence.

Trip N.B.

10,290-10,300
Tr. Coal
30% Shale
20% Siltstone
50% Sandstone, light brown and white aggregates, fine to medium grained, moderately sorted, clay matrix, tight, hard.

10,300-10,310
Tr. Coal - Gas kicked 200 units.
20% Shale
40% Siltstone, dark brown and grey, dolomitic, argillaceous thinnly laminated with very fine to fine sand layers.
40% Sandstone aggregates, as above, no show, slightly dolomitic, (very dull fluorescence) Abundant lithic fragments.
Gas died away - then kicked 150 units.

10,310-10,320
Tr. Coal
30% Shale
20% Siltstone
50% Sandstone aggregates very fine-fine, silty, occasional mud, No show, very tight.

10,320-10,330
Tr. Coal
40% Shale
20% Siltstone
40% Sandstone aggregates, very fine to fine to medium grained, moderately to poorly sorted, abundant lithics, slightly dolomitic, tight. Patchy light blue fluorescence, slow weak light blue cut.

10,330-10,340
Tr. Coal
30% Shale, as above.
30% Siltstone, as above.
40% Sandstone as above, decreasing amount

10,340-10,350
Tr. Coal
60% Shale, as above.
20% Siltstone
20% Sandstone, as above.

Drilling break 60 units gas.

10,350-10,360
Tr. Coal
30% Shale
10% Siltstone
60% Sandstone, very fine to fine and medium occasional coarse grains. Patchy to dull light blue fluorescence, very slow and weak cut.

Gas died away - kicked 140 units.

10,360-10,370
Tr. Coal
20% Shale
10% Siltstone
70% Sandstone fine to medium aggregates, loose coarse to very sub-angular quartz grains.
Good dull yellow and light blue fluorescence, slow light blue cut.

Trip. 10,389 T.D.

10,389-10,420 Trip sample.

Trace Coal
60% Shale as above.
20% Siltstone, as above.
20% Sandstone, as above, aggregates and loose grains scattered light yellow fluorescence.

10,420-10,430
Tr. Coal
20% Shale, as above.
10% Siltstone
20% Sandstone, as above.

10,430-10,440
Tr. Coal
70% Shale, dark grey and brown, very carbonaceous, hard.
20% Siltstone and light brown very fine sandy, argillaceous.
10% Sandstone, rare scattered shows.

10,440-10,450
Tr. Coal
30% Shale
10% Siltstone
50% Sandstone aggregates, light brown to white, very fine to fine, fine to medium and coarse to very coarse types, abundant clay matrix, lithics. No shows.

10,450-10,460
Tr. Coal
70% Shale, as above.
20% Siltstone, as above.
10% Sandstone, as above.

10,460-10,470
10% Coal
60% Shale as above.
10% Siltstone
20% Sandstone aggregates and loose grains.

Drilling break and gas kick 90 units.

10,470-10,480
30% Shale
10% Siltstone
60% Sandstone aggregates and loose grains, scattered, patchy light blue fluorescence, slow light blue cut.

10,480-10,485
60% Sandstone, clear to buff, to light grey, abundant loose sand grains, coarse to very coarse (±50%) (50%), quartzose sandstone abundant lithics (5%) dolomitic with some clay matrix fine to medium grained spotty bly. white fluorescence sub angular.

10,480-10,485	10%	Coal
	20%	Shale, light brown grey, silty, weak laminae to fissile.
	10%	Siltstone
10,485-10,489		Sandstone silty quartzosic with abundant to scattered <10% lithics felds, white, angular, very fine to fine occasionally medium to coarse subangular poorly sorted abundant clay matrix, poor visible porosity and permeability, spotty yellow fluorescence, interstitial and associated only with clay, fair to good rib cut. Light brown oil stain in clay.
10,489-10,490		Sandstone as above. No show except for 8¼ m. bands sho as associated with carbonaceous laminae. Shale medium grey,blty, hard.
10,513-10,520	90%	Shale, dark brown grey
	10%	Sandstone, buff, light brown grey, very fine to fine occasionally medium, occasional loose grains, subangular and subrounded,well sorted clay matrix abundant, slightly dolic, poor porosity, occasional yellow spotty fluorescence, no stn, not cut, occasional abundant lithic.
10,520-10,540	100%	Shale. Trace sandstone.
10,540-10,550	90%	Shale. Trace sandstone.
	10%	Siltstone, light grey, no show.
10,550-10,570	90%	Shale.
	10%	Sandstone as above with scattered loose qt grained to very coarse.

Core No. 3

5'	Sandstone, top 6" wavy discontinuous carbonaceous laminae 4½' medium bdd. sandstone with large scale bdd. 1 sandstone & shale laminae.
9'	Shale, very dark brown grey hard blty with faint carbonaceous wavy laminae.
6"	Shale as above with coal lense.
3'	Shale as above
1'	Siltstone with wavy carbonaceous laminae
3'	Shale as above
6"	Shale, black, very carbonaceous with coal lenses
6'	Shale, dark brown grey as above

10,570-10,590	100%	Shale as above. Trace sandstone as above. Trace coal.
10,590-10,595	80%	Sandstone, unconsolidated, clear quartz grains coarse to very coarse. 1000 units gas, angular, well sorted.
	10%	Sandstone clusters as above
	10%	Shale
10,595-10,600	100%	Sandstone quartzose, unconsolidated, clear quartz, coarse grained, subangular to subrounded, heavy, trace shale, trace coal.
10,600-10,610	50%	Sandstone, unconsolidated as above
	50%	Shale as above.
10,610-10,620	30%	Sandstone as above
	20%	Siltstone, light grey, carbonaceous laminae
	50%	Shale as above
10,620-10,630	40%	Siltstone, light grey to grey brown as above
	60%	Shale as above. Trace sandstone as above. Trace coal.
10,630-10,640		LAT
	20%	Sandstone
	20%	Siltstone
	60%	Shale

10,640-10,650	20%	Siltstone
	80%	Shale
		Trace Sandstone
10,650-10,660	10%	Sandstone, buff to very light grey, very fine to fine, silty, subangular, well sorted, poor porosity and permeability, no show.
	50%	Siltstone, light grey with very fine sand grains, well sorted
	40%	Shale.
10,660-10,665	80%	Sandstone, unconsolidated, coarse to very coarse, subangular, well sorted, cr. porosity and permeability in part sandstone as above.
	10%	Siltstone as above
	10%	Coal and shale
10,665-10,670	80%	Sandstone
	50%	Unconsolidated as above
	50%	Quartzose aggregates, clay choked, buff to light brown, very fine to fine occasionally medium, subrounded to subangular, medium or sorted, some pp. porosity, occasionally with clay matrix,
	20%	Siltstone and shale.
10,670-10,675	80%	Shale
	20%	Sandstone, quartzose, clay choked as above.
		Trace coal.
		Trace unconsolidated sandstone.
10,675-10,680	50%	Shale
	40%	Siltstone, light grey
	10%	Quartzose, clay matrix, sandstone
10,680-10,685	10%	Sandstone
		Trace coal.
	40%	Shale
	50%	Siltstone
10,685-10,690	40%	Sandstone, quartzose, clay plugging, dolic common very fine to fine, occasionally medium to coarse, subangular, poorly sorted, tf to poor porosity, occasional coarse grains. No show.
	20%	Siltstone
	40%	Shale
10,690-10,700	100%	Shale, very dark grey black, blky, silty lustre, very carbonaceous, trace sandstone, trace siltstone.
10,700-10,720	70%	Shale as above
	10%	Sandstone as above. Trace siltstone.
New Litho:	10%	Sandstone, white to buff, fine grained clay plugged medium to well sorted, subangular, tf no show except ..... fluorescence, very spotty, N. cut in part, medium grey, very fine to fine hd. Tf interbedded with light grey siltstone. Trace siltstone
	90%	Shale as above.
10,720-10,730	60%	Shale, carbonaceous, dark brown to black in part dark brown grey
	20%	Sandstone aggregates, very fine to fine, sub. and moderately sorted dolic clay matrix, tf porosity and permeability, spotty dull yellow flourescence, no. cut.
10,730-10,740	70%	Shale as above
	10%	Sandstone as above
	20%	Coal
10,740-10,750	90%	Shale as above
	10%	Sandstone as above. Trace coal.
10,750-10,760	90%	Shale as above
	10%	Sandstone as above. Trace coal.

10,760-10,770		LAT
	30%	Sandstone, quartzose, light grey, occasional abundant clay matrix, occasionalcarbonaceous laminae, occasionally slightly dolomitic, very fine to fine, sub angular, moderately well sorted, tf - poor permeabilify and porosity in part pale spotty yellow fluorescence and occasional slow cut with sands associated with carbonaceous laminae.
	60%	Shale as above
	10%	Siltstone light grey.
10,770-10,780	80%	Sandstone, quartzose, light grey with black mtling from carbonaceous mat. in part as above. Fine to medium occasional sub and moderately to poorly sorted. Slightly dolomitic in part. Spotty yellow fluorescence, sl. cut.
	20%	Shale
10,780-10,810	70%	Sandstone, light grey with dark grey mtld. Quartzose carbonaceous, occasionally slightly dolic, very fine to fine, occasional medium angular, well sorted . Abundant carbonaceous matrix tf very hard yellow spotty fluorescence, no cut.
	30%	Shale as above.
10,810-10,820	30%	Intrusive quartz ..... porphitic basalt?
	10%	Shale cavings, dark brown grey to grey black. Quartz rich ferro-mag. aphatic ground mass
10,820-10,830	40%	Intrusive
	60%	Shale
10,830-10,840	80%	Quartz, porphoritic basalt, dark grey with light grey plagioclase phenomart in quartzitic matrix grand mass
	20%	Shale
10,840-10,850	70%	Basalt
	30%	Shale
	10%	Sandstone, white quartzose, heavy tr. black grains. Very fine to fine, occasionally medium, angular medium sorted tf. No show.
10,850-10,865	80%	Basalt
	20%	Shale
10,865-10,870	10%	Shale
	40%	Basalt, black as above in part with green
	50%	Sandstone, mtld, light grey and black quartzose with basalt grains, very fine to coarse, poorly sorted, angular, very hard tf, possible frac. por.
10,820-10,875	80%	Sandstone, light grey with dark grey specks (basalt grains), very fine to fine occasionally medium well sorted, angular, very hard tf. No show. Trace sandstone buff, subrounded, fine to medium grained, dolic well sorted poor porosity, yellow fluorescence, no cut.
	20%	Basalt
10,878-10,880	60%	Dolomite, buff to cream microxln, angular, hard, very coarse to granular sized chips
	10%	Sandstone as above
	10%	Shale
	10%	Basalt
10,878-10,880	70%	Dolomite as above varicoloured white - buff - tan . mottled
	10%	Quartz grains, angular
	20%	Basalt. Trace ? serpentine.

10,880-10,890	40%	Dolomite, light grey to buff, microxln in port, in part gives appearance of rexalized spicular lr. Light grey, angular, tf hard
	30%	Sandstone, light grey to dark grey, quartzose, with abundant basalt grains and green mtld; fine to medium grained, angular, dolic, yellow fluorescence, no cut.
	10%	Shale cavings.
	20%	Basalt in part wthd
10,890-10,900	10%	Dolomite
	90%	Lithic sandstone, light-dark grey mtld with green cast. Abundant play occ. wthd grains, basalt grains, very fine to medium, poorly sorted, angular, hard, tf, no show.
10,905-10,910	60%	Lithic sandstone ? as above
	20%	Dolomite
	20%	Basalt
10,910-10,920	40%	Basalt
	60%	Lithic sandstone as above. Trace dolomite Trace shale
10,920-10,930		As above
10,930-10,940	80%	Sandstone as above
	20%	Basalt
10,940-10,950		As above. Sandstone, medium light to dark grey with green cast. Very fine to fine subangular to angular, abundant plag. basalt grains unweathered ± 40% of sample, hard, tf, no show.
10,950-10,970		As above

Drilling resumed at 7.45 am at 11,009 ft 3.9.68 after reaming about 60 ft.

7-7/8" hole. H7UJ Security bit

11,009-11,020	90%	Volcanics. 2 types A) black matrix and clear euhedral xtals feldspar. Hard. B) Material which consists of white feldspar xtals and pale green med. soft talcy mineral + traces of pale green mineral looks like olivine and shiny black platy mineral possible Fe oxide.
	10%	Sandstone, light grey, quartz, subangular, compact, firm, well sorted, carbonaceous flecks, trace mica, slightly dolomitic, traces of green talcy min, minor clay white could be decayed feldspar, no lithics or other access, porosity and permeability low. Traces of shale, dark grey brown; calcite loose coarse white grains; dolomite aggregate grains; green mineral nepheline amphibole?? pale green, talcy, mod. soft, non calcareous, no fluorescence, columnar nature, found in volcanics also. No fluorescence apart from mineral fluorescence of dolomite and calcite.
		No show.
11,020-11,030	40%	Shale, dark grey brown, firm silty in part, carbonaceous flecks to thin layers,non calcareous, no bedding, slightly micaceous.
	40%	Volcanics as above
	10%	Sandstone as above
		Trace Calcite, Dolomite, pale green min. Mineral fluorescence.
		No shows.
11,030-11,035	50%	Shale as above, becoming more silty and occasional medium grained quartz grain present.
	30%	Volcanics as above
	10%	Sandstone as above

11,030-11,035 (Cont)		Trace dolomite, calcite, green mineral. Mineral fluorescence No show. P.O.H. at 11,035 ft. at 1.45 am, 4.9.68

Drilling ahead at 9.30am, 4.9.68.

Note:	Depth diff.	Baroid 11,041 ft. Driller 11,035 ft. Assume driller correct. Baroid corrected to 11,035 ft.
11,035-11,045		Volcanics, shale, sandstone, trace dolomite, calcite and green mineral. Volcanics predominant in sample
11,040	90%	Diabasc (intrusive), very dark grey to grey black with green cast abundant, olivene or chlor, fine euhedral plag laths, almost aphaetic to fine xln, abundant foreg mags.
	10%	Shale, brown grey, blky cugs? Trace sandstone brown, f. to tan, fine to medium grains
11,050	10%	Shale as above
	20%	Sandstone, buff to tan to light grey, dolic, in part interstitial clay, very fine to fine occasional tn. Subrounded to subangular, occasional abundant lithics poorly sorted tf. Min. fluorescence only.
	70%	Diabasc as above, ... Trace dolomite.
11,060	10%	Shale as above
	30%	Sandstone as above
	60%	Diabasc as above, heavy dolomitic
11,070	10%	Sandstone
	10%	Siltstone
	20%	Siltstone, brown grey, carbonaceous
	60%	Intrusive diabasc
11080	40%	Sandstone, quartzose, white to buff to light grey, very fine, subangular, subrounded, medium to well sorted in part with clay matrix, in part with abundant lithics
	10%	Shale and arg. siltstone brown grey.
	50%	Diabasc as above
11,090	50%	Sandstone
	10%	Shale
	40%	Diabasc
11,100		As above
11,110	40%	Shale, slightly brown grey, occasionally with scattered carbonaceous diabasc blky
	10%	Sandstone as above
	50%	Diabasc
11,120	50%	Shale as above
	20%	Sandstone
	30%	Diabasc
11,130	30%	Shale as above
	20%	Sandstone as above
	50%	Diabasc

11,133	30%	Shale as above
	30%	Sandstone
	40%	Diabase
11,200-11,210		Poor Sample
	60%	Sandstone) Lot of cavings due to prior
	40%	Siltstone) reaming.
11,210-11,220	100%	Sandstone

40% loose sand, very fine to medium clear quartz. Subangular to subrounded with occasional well rounded grains. Good sorting. Cemented with soft kaolinitic matrix. Probably very low porosity.
30% Kaolin. 60% Sandstone, white, medium to very coarse, mainly coarse. Some go up to granule size. The medium to coarse material shows good sorting and is subangular to subrounded to rounded, while the coarser material is poorly sorted, medium to medium hard and is cemented with argillaceous matrix.
No fluorescence or CUT.

800 unit gas kick - - C_1 only

R.T.C.B.

11,220-11,230)
) EXTREMELY CONTAMINATED SAMPLES.
) Probably siltstone.
11,230-11,240)

11,240-11,250	100%	Sandstone

60% loose sand - kaolin matrix as above
40% sandstone - medium hard, medium to coarse as above. Slight gas kick but no fluorescence or cut.

Still contaminated with volcanics.

11,250-11,260	70%	Siltstone) 50% of sample is volcanics
	30%	Sandstone)

Volcanics - olive green to dark green to black - some clear white crystals (quartz)

11,260-11,270	40%	Siltstone - light brown to brown, some orange buff. Sandy in part and grades to very fine
	10%	Sandstone; sandstone as above, very fine to medium.
	50%	Volcanics
11,270-11,280	70%	Sandstone, white to buff, fine to coarse, mainly medium; no show.
	20%	Siltstone - carbonaceous in part.
	10%	Shale - grey brown - medium hard, sometimes slightly silty.
		Trace volcanics.
11,280-11,290	100%	Sandstone, clear quartz, medium to granule - mainly very coarse. Large grains tend to be angular to subangular. Poor to fair sorting. Small gas kick. Sandstone is fairly unconsolidated in part and breaks into separate grains. No fluorescence, but slightly blue cut.
11,290-11,300	100%	Sandstone - 60% loose sand - medium grained well sorted, subrounded to rounded; 40% sandstone as above.
		Trace brown siltstone
		180 gas kick at 11295.
		No fluorescence but good strong gold cut - possible brown staining on some sandstone grains. Seems to be tarry rather than oily. Some carbonaceous material present but it cuts blue, not gold.
11,300-11,310	70%	Sandstone - still with gold fluorescence
	30%	Siltstone - slightly micaceous.
11,310-11,320	50%	Sandstone, very fine to medium, as above
	50%	Siltstone, brown, carbonaceous in part.

Gas has some C_3 - over ≈ 12'

Yellow cut is contamination of pipe-scale (a rust inhibitor)

11,320-11,330	70% 30%	Sandstone as above Siltstone
11,330-11,340 800 unit gas kick. Good drilling break.	100%	Sandstone. Loose sand, clear to white quartz, very coarse to granule.. Fair to good sorting, angular to subrounded. Apparently excellent porosity and permeability. Possible faint light blue cut. Gold mineral fluorescence ? dolomite. Some aggregates seem to have light brown argillaceous cement, but most grains break loose.
11,365	100%	Sandstone, loose sand, clear to white quartz, coarse to granule, fair sorting. Some argillaceous cement in aggregates. Gas kick 2000 units + - probable combination of trip gas and new formation. Up to C_5 in gas. No fluorescence or cut.
11,370	100%	Sandstone as above - probably some kaolin matrix.
11,380	100%	Sandstone as above. Some grains seem to be broken pebble fragments.
11,390	(40% (40% 20%	Sandstone, loose sand as above Sandstone, white to buff, very fine to medium, subangular to subrounded, argillaceous cement, no show. Siltstone, brown, carbonaceous. Trace dolomite.
11,390-11,400	60% 40%	Sandstone, very fine to very coarse. Siltstone, brown to very carbonaceous in part. Some material grading very siltstone and very fine sandstone.
11,400-11,410	80% 20%	Sandstone. Mainly loose sand. No show. Siltstone.
11,410-11,420	20% 70% 10%	Sandstone. Siltstone (1) Dark brown, hard carbonaceous (2) Mottled brown, medium hard, micaceous. Shale, silty, light grey brown, soft.
11,420-11,430	20% 50% 20% 10%	Sandstone, white, brown Siltstone, very sandy, grades into sandstone, brown, carbonaceous and bleeding gas. Gas will give light blue cut. Silty shale. Light grey. Coal. Black, brittle, bleeding gas. Trace - 5% dolomite, brown, hard, Xtl'n.
11,430-11,440	40% 40% 20%	Sandstone, white and medium brown; brown is due to matrix - quartz is clear to white. Angular to sub-rounded. Very fine to medium - mostly medium. Grades down into sandy siltstone below. No show. Siltstone, brown, carbonaceous, micaceous, very sandy in part. Shale, silty, grey to grey brown. Trace coal and dolomite.
11,440-11,450		As above. Some sand grains have a black, possibly carbonaceous coating - insoluble in chlorothane.
11,450-11,460	70% 30%	Sandstone as above. Poorer sorting in coarser fraction. Range fine to coarse granules. Mainly coarse grained. No show. Siltstone as above.
11,460-11,470	80% 20%	Sandstone. 50-50 loose sand and aggregate. No show. Siltstone.

11,470-11,480 800+ gas kick	100%	Sandstone. 50% loose sand, coarse-granle as above 50% sandstone. Clear quartz grains with brown matrix - argillaceous and dolomitic, medium to granule, poor sorting. Medium hard - breaks into grains fairly easily. No fluorescence. Trace of sandy siltstone - brown, with pinpoint blue fluorescence and blue cut.

Mud cut to 8.9 (from 12.2). Could not hold well. Mud was cut consistently to ≈ 11.0. Increased weight to 12.5.

11,480-11,490	100%	Sandstone. Loose sand. Mainly medium to coarse with some granule. Subrounded to rounded. Clear quartz. Good sorting. No fluorescence or cut. Some aggregates break pretty easily into single grains. Slight irregular fluorescence and weak blue cut.
11,490-11,500	80%	Sandstone. Loose sand as above and sandstone - brown, poor sorting, clear quartz in brown dolomitic and argillaceous cement, tt. Weak pinpoint and streaky fluorescence and cut.
	20%	Siltstone, brown.

T.D. 11,504.

11,500-11,510	60%	Sandstone, white to buff to medium brown. Grades from very fine grained silty sandstone to coarse grained - mainly fine to medium.
	30%	Siltstone. Brown.
	10%	Dolomite. Chocolate brown. Dolomite appears to be acting as a filling for fractures as well as a matrix cement. Section seems to be alternating, thin bedded, siltstone and sandstone - each grading into the other. Good blue mineral fluorescence but no cut.
11,515		Loose sand inc. medium to coarse, subrounded to rounded, well sorted. Some sandstone aggregates have blue fluorescence and cut - aggregates have brown matrix but colour is probably due to dolomitic and argillaceous cement.
11,510-11,520	90%	Sandstone. 50% Loose sand as above. 50% sandstone aggregates - brown and white matrix and trace py. in sandstone. Is very poorly sorted - fine to coarse with some pebbles imbedded in sandstone. tt. Rare granules (5%) have blue fluorescence and cut.
11,520-11,530		As above. Increase in % of sandstone very loose sand.
11,530-11,540	100%	Cement.
11,540-11,550	100%	Cement.
11,550-11,560	50%	Sandstone, light grey, fine to medium, hard, subangular to subrounded, argillaceous cement, tt, no show, interbedded with thin black coal, bleeding gas.
	50%	Siltstone, grey brown to dark brown, hard, shaley in part. Still cement contamination. Poor sample.
11,560-11,570		Poor sample, as above. Lot of clayey mud - suspect is mud balling up from mud cake on casing.

11,570-11,580	30% 60% 10%	Sandstone as above, very fine to fine. Siltstone, dark brown, carbonaceous, bleeds gas. Coal, black, irregular fracture, bleeding gas. Abundant cement contamination.
11,580-11,590	80%	Sandstone, light grey to brown, very fine to medium, subangular to subrounded, fair to poor sorting, white clay matrix in part, tt, browner sandstone appears to be siltier and more carbonaceous, no show.
	20%	Siltstone, brown, hard, with pieces of carbonaceous material. Cement contamination.
11,590-11,600		As above.
11,600-11,610	100%	Sandstone. 70% loose sand. Clear quartz, medium grained, well sorted, subrounded to rounded, no show. 30% sandstone, light grey, very fine to medium as above. Trace coal bleeding gas and brown siltstone.
11,610-11,620	100%	Sandstone. 50% loose sand, clear quartz, medium to coarse with occasional granule size. Subangular to rounded, fair sorting. Bit coarser than last sample. No show but 200 unit gas kick. Mud cut from 13.2 to 12.5 but recovered. 50% sandstone, light grey, medium to coarse, poor sorting and some angular grains. tt. No show, Micaceous and carbonaceous. Trace coal and brown carbonaceous siltstone.
11,620-11,630	30% 70%	Sandstone, light grey, poor sorting, silty, as above. 70% Siltstone, grey brown to brown, carbonaceous, occasional grades into dark silty coal.
11,630-11,640	40% 60%	Sandstone, very fine to medium with occasional coarse as above. Siltstone, brown, carbonaceous. Trace coal.
11,640-11,650	50% 50%	Sandstone as above Siltstone as above
11,650-11,660	60% 40%	Sandstone, very fine to medium light grey, subangular to subrounded, thin carbonaceous lamellae, argillaceous cement. Siltstone, brown and dark grey, carbonaceous.
11,660-11,670	90%	Sandstone. 60% loose sand clear quartz, medium grained, fair to good sorting, subrounded to rounded, no show. 30% Sandstone, light grey, fine to coarse, subangular to subrounded, very silty in parts, hard, argillaceous matrix, no show.
	10%	Siltstone as above.
11,670-11,680	100%	Sandstone. 60% loose sand, medium to coarse, subangular to subrounded with some rounded. Good sorting, no show. 40% sandstone, light grey to orange brown, fair to coarse with some granule, very poor sorting - silty matrix. Micaceous and carbonaceous, occasional green grains. No show. Gas kick 20 units. Trace coal.
11,680-11,690	100%	Sandstone, as above. 50% loose sand. 50% sandstone.
11,690-11,700	100%	Sandstone. 30% loose sand. 70% sandstone, light grey to light brown, fine to coarse, mainly coarse with some granular. Angular to subrounded - coarser grains being more angular. Abundant argillaceous cement. No show. Trace green lithics. Carbonaceous and slightly dolomitic.

11,700-11,710	100%	Sandstone, light grey to light brown as above, very fine to coarse, mainly fine to medium. Grades thru silty sandstone to a brown siltstone. Carbonaceous lamellae. Trace coal.
11,710-11,720	50%	Sandstone as above
	50%	Siltstone, grey brown, hard carbonaceous, grades into very fine sandstone. Trace coal, hard, black, conchoidal fract.
11,720-11,730	90%	Sandstone as above
	10%	Shale as above.
11,730-11,740	100%	Sandstone, light grey, medium to coarse, mainly medium. tt. as above, no show.
11,740-11,750	60%	Sandstone as above
	40%	Siltstone, medium grey, hard, micaceous, grades into a silty shale.
11,750-11,760	40%	Sandstone
	60%	Siltstone and silty shale (light grey brown)
11,760-11,770	100%	Siltstone, grey to grey brown, hard, carbonaceous.
11,770-11,780	100%	Siltstone, medium grey grading into very fine silty sandstone and into silty shale.
11,780-11,790	20%	Sandstone, light grey as above, medium to coarse with some very coarse.
	40%	Siltstone, grey brown
	30%	Shale, dark grey, hard.
	10%	Coal, black, conchoid fract.
11,790-11,800	40%	Sandstone
	40%	Siltstone
	10%	Coal
	10%	Shale
TRIP CB. 11,801		
11,800-11,810	60%	Sandstone (40% light grey, medium to coarse, with abundant argillaceous matrix; 20% loose sand grains. Medium. Subangular to subrounded)
3,000 unit Trip gas ? from Top of this sand	10%	Siltstone.
	20%	Shale, dark grey
	10%	Coal
11,810-11,820	60%	Sandstone (40% loose sand, subrounded, good sorting, no show. 20% sandstone as above, poor sorting, angular to subangular, medium to very coarse)
	20%	Siltstone
	20%	Shale
11,820-11,830	80%	Sandstone (40% loose sand, medium to coarse, subangular to subrounded. 40% sandstone, medium to coarse with occasional granules)
	20%	Siltstone
11,830-11,840	70%	Sandstone. 40% loose sand. 30% sandstone, very fine to coarse, grades into siltstone.
	30%	Siltstone, grey to dark grey.
11,840-11,850	30%	Sandstone, light grey, medium to coarse.
	40%	Siltstone, carbonaceous.
	20%	Shale.
	10%	Coal.

11,850-11,860	80%	Siltstone, grey to dark grey, carbonaceous.
	20%	Shale, grey brown, medium hard.
11,860-11,870	20%	Sandstone, carbonaceous.
	20%	Siltstone, carbonaceous.
	40%	Shale, medium grey, soft.
	20%	Coal, black, brittle, bleeding gas.
11,870-11,880	20%	Sandstone, light grey as above, medium to coarse.
	20%	Siltstone, dark grey
	50%	Shale, grey brown to dark grey
	10%	Coal.
11,880-11,890	20%	Sandstone as above, carbonaceous lamellae
	30%	Siltstone.
	50%	Shale - carbonaceous
		Trace - 5% coal.
11,890-11,900	20%	Sandstone
	30%	Siltstone
	40%	Shale
	10%	Coal
11,900-11,910	20%	Siltstone
	30%	Shale
	50%	Silty coal
11,910-11,920	30%	Siltstone - grey
	30%	Shale - grey brown
	40%	Silty coal
		Trace to 5% sandstone
		RARE VOLCANICS GREEN XLNE.
11,920-11,930	10%	Sandstone, very fine
	30%	Siltstone
	40%	Shale
	20%	Coal
11,930-11,940	80%	Sandstone, white to light brown, coarse-grained with some medium. Poor sorting, angular, brown argillaceous matrix, bleeding some gas ?? no fluorescence or cut. tt. Dolomitic cement. Occasional grey lithic grains in sandstone, negative chip-in-acid.
980 unit gas kick. Mud from 13.5 to 11.9		
	20%	Siltstone.
11,940-11,950	30%	Sandstone.
	30%	Siltstone) Both highly carbonaceous
	30%	Shale)
	10%	Coal
11,950-11,960	50%	Sandstone, very fine to coarse - poor sorting, angular to subangular, no show.
	30%	Siltstone.
	20%	Shale
		Trace green Volcanics. SG = 2.87.
11,960-11,970	80%	Sandstone, white to light grey, medium grained, fair sorting subangular to subrounded, silicious and kaolinitic cement. tt. No show. Micaceous.
	20%	Siltstone. Trace coal.
11,970-11,980	40%	Sandstone
	40%	Shale
	20%	Coal

11,980-11,990	20%	Sandstone, light brown grey, very fine grained to fine grained, and in part medium grained, fair to poor sorting, subangular to subrounded, silicious and kaolinitic cement well lithitied, minor carbonaceous flecks.
	80%	Silty shale to siltstone, dark brown grey and brown grey, micaceous and very carbonaceous, sub fissile, well compacted - tough : siltstone grades to dirty, very fine grained sandstone in part. Trace coal as above.
11,990-12,000	10%	Sandstone as above
	60%	Sandstone, light brown grey, mainly fine grained, occasional medium and coarse grains, dirty, clay choked, very carbonaceous in part, minor trace of very finely disseminated pyrite grades in color to dark brown grey in dirtier, more carbonaceous portions. Grades to sandy siltstone in part.
	30%	Silty shale to siltstone as above. Trace coal as above.
12,000-12,010	60%	Sandstone, light grey to light brown grey and grey brown dominantly medium grained range. Varies fine to rarely coarse grained, angular to rounded; low order porosity, 12-15% range probable, dirty in part as above.
	40%	Siltstone and silty shale as above Trace coal as above.
12,010-12,020	40%	Sandstone as above
	60%	Shale to silty shale and siltstone in part as above.
12,020-12,030	60%	Sandstone, light brown grey, dominantly fine grained to occasional medium and coarse grains, clay choked, poor porosity, minor dolomitic cement, grades to dark brown grey carbonaceous sandstone in part and to siltstone.
	40%	Shale, dark brown grey to brown grey grades to siltstone in part. Trace coal.
12,030-12,040	60%	Sandstone as above
	40%	Shale to siltstone as above
12,040-12,050 (046)	70%	Sandstone, light brown grey and brown grey as above, fine to medium grained. Slight increase in # of loose quartz grains (to cosrse grains)
	30%	Silty shale to siltstone as above Trace coal as above
12,050-12,060	60%	Sandstone, light brown grey to grey, very fine to coarse grained, mainly fine to medium grained, clay choked in part richly carbonaceous; cleaner portions contain >5% dark and grey mineral grains and dolomitic cement.
	40%	Siltstone - shale as above. Trace coal.
12,060-12,070	50%	Sandstone as above, mainly fine to medium grained
	50%	Shale to siltstone as above Trace coal.
12,070-12,080	20%	Sandstone as above, fine to medium grained.
	80%	Shale to siltstone, brown grey and grey, usually very carbonaceous, very well lithified, micaceous. Trace coal as above.

12,080-12,090	10%	Sandstone as above
	90%	Shale to silty shale to siltstone, dark brown grey to grey, richly carbonaceous and micaceous
		Trace coal as above
12,090-12,100	10%	Sandstone as above
	90%	Shale to siltstone - dark brown grey to brown grey, micaceous and carbonaceous as above - well lithified.
		Minor trace pyrite ? in matrix of sandstone.
		Trace coal as above.
12,100-12,110	20%	Sandstone as above
	80%	Shale to siltstone, brown grey and dark brown grey, carbonaceous and micaceous. Trace coal.
12,110-12,120	30%	Sandstone as above
	70%	Shale to siltstone as above
		Trace coal
12,120-12,130	50%	Sandstone as above
	50%	Shale to siltstone as above (increase in siltstone component)
		Trace coal (increasing)
12,130-12,140	10%	Sandstone as above
	90%	Siltstone to silty shale, dark brown grey to chocolate brown; richly carbonaceous with abundant fine carbon flecks and micromicaceous - fine mica flecks in siltstone portion - well lithified. Trace coal as above.
12,140-12,150	10%	Sandstone as above
	90%	Siltstone to shale as above
12,150-12,160	90%	Sandstone, light grey to light ol. grey, very fine grained to fine grained, clay matrix and dolomitic cement - very well lithified : salt and pepper appearance in part grades to carbonaceous rich silty micaceous sandstone in part, occasional coarse quartz grains.
	10%	Siltstone to shale as above
		Trace coal.
12,160-12,170	10%	Sandstone as above
	80%	Silty shale to shale as above
	10%	Coal, black, brittle
12,170-12,180	20%	Sandstone, light brown grey to light grey, very fine to coarse grained, dominantly fine to medium grained, very poorly sorted clay matrix, dolomitic cement, salt and pepper appearance in part.
	80%	Silty shale to siltstone as above.
		Trace coal and dark green and gren grey fragments.
12,180-12,190	10%	Sandstone as above
	80%	Silty shale to siltstone
	10%	Coal as above
12,190-12,200	20%	Sandstone, light grey and light brown grey, very fine to medium grained as above
	80%	Siltstone and silty shale, dark brown grey to brown grey with minor light brown grey.
		Trace Coal as above.
12,200-12,205	70%	Sandstone, light grey and light brown grey, salt and pepper coloration in part; fine to coarse grained dominantly fine to medium grained size range clay matrix and dolomitic cement.
	30%	Shale to siltstone as above
		Trace coal as above.
12,205-12,210	40%	Sandstone as above
	60%	Shale to siltstone as above
		Trace coal as above

12,210-12,214	60%	Sandstone as above
	40%	Shale to siltstone as above
		Trace coal as above
12,214-12,220	20%	Sandstone as above
	80%	Shale to siltstone, dark brown grey to brown grey, richly carbonaceous and micaceous. Trace coal as above.
12,220-12,230		Trace sandstone
	100%	Shale to siltstone as above
		Trace coal as above
12,230-12,240	30%	Sandstone, light brown grey, fine to medium grained as above.
	60%	Silty shale to siltstone.
	10%	Coal as above
12,240-12,250	10%	Sandstone as above
	85%	Silty shale and shale, dark brown grey and chocolate brown grey.
	5%	Coal
12,250-12,260		Trace sandstone as above
	100%	Shale - silty in part, dark brown grey and dark grey in part, with minor light brown grey - carbonaceous, micaceous.
12,260-12,262		Trace sandstone as above
	90%	Shale - dominantly dark grey and dark brown grey
	10%	Coal
12,262-12,270	20%	Sandstone, light brown grey, medium grained, fine-w.s.
	70%	Shale, dark grey and dark brown grey, richly carbonaceous, sub fissile
	10%	Coal.
12,270-12,280		Trace sandstone.
	100%	Shale, dark grey and silty shale dark brown grey, carbonaceous, fair to well compacted, sub fissile. Trace coal.
12,280-12,290	20%	Sandstone, light grey and light brown grey, fair to coarse grained dominantly medium grained, clay matrix, minor amount of dolomitic cement, well lithified thin carbonaceous laminae, in some fragments.
	80%	Shale, silty in part, dark brown grey, minor light brown grey, carbonaceous.
12,290-12,300		Trace sandstone as above
	70%	Shale, silty in part as above
	30%	Coal as above
12,300-12,310		Trace sandstone as above
	100%	Shale (mudstone) dark brown grey and dark grey sub fissile in part, in part non fissile : carbonaceous and micaceous in part. Dark grey shale carbon rich. Trace coal.
12,310-12,320		Trace sandstone as above
	100%	Shale as above

SIDEWALL CORE DESCRIPTIONS

519

SNAPPER A-1

SIDEWALL CORES

RUN NO. 1

3474'	Mudstone:	trace recovery, green grey, slightly calcareous slightly micaceous
3558'	Mudstone:	½" recovery, light grey, slightly calcareous
4598'	Mudstone:	trace recovery, medium grey, slightly calcareous very slightly micromicaceous

SIDEWALL CORES - RUN NO. 2 (3390'-4604')

Shot 30 cores; Recovered: 12 cores, 5 chips (L¼"), 11 empty bullets and 2 misfires (Used 80 grains of Australian powder - I.C.I. - per shot)

Depth	Recovery	Description
4598'	L¼" (chip)	Sandstone, light grey, fine to medium grained, poorly sorted, sparse white clay matrix, slightly glauconitic, no fluorescence, no cut, slightly petriliferous odour, no stain.
4594'	L¼" (chip)	Sandstone, medium grey, fine to coarse grained, poorly sorted, abundant white argillaceous matrix, non calcareous abundant carbonaceous flakes, no (very faint pale blue-white) fluorescence, no cut, no stain, no odour.
4564"	1/8" (chip)	Sandstone, light grey, fine grained, very abundant white clay matrix, even blue-white fluorescence and cut, slightly petriliferous odour
4020'	½"	Silty shale, medium dark grey, common glauconitic and fine micaceous flakes, no show.
3992'	¼"	Sandstone, light grey-brown, very fine grained, good sorting, common glauconitic no fluorescence or cut, slightly petriliferous odour, slightly argillaceous matrix, non calcareous.
3945'	½"	Mudstone, medium grey, smooth, occasional medium grained sand grain, calcareous, soft.
3850'	3/4"	Mudstone, as above
3850	1¼"	Mudstone, as above
3850	1"	Mudstone, as above
3850	½"	Mudstone, as above
3725	¼" (chip)	Mudstone, medium-grey, smooth, soft, calcareous.
3558	¼" (chip)	Mudstone, as above
3512	3/4"	Mudstone, as above
3492	3/4"	Mudstone, as above
3452	3/4"	Mudstone, as above
3390	3/4"	Mudstone, as above

SIDEWALL CORES - RUN NO. 3 (2600-4604')

Shot 30 cores; recovered: 12 cores; 9 chips, 8 empty bullets and 1 misfire
(Used 120 grains of Australian powder - I.C.I. -- per shot)

Depth	Recovery	Description
4592	L 1/8" (chip)	Sandstone, light grey, fine to medium grained, well sorted, sparse white clay matrix, friable, pale even blue-white fluorescen slight petriliferous odour, even blue-white chert
4590	L¼" (chip)	Sandstone, as above, bright even blue-white fluorescence and cut, distinct petriliferous odour, no stain
4589	L 1/8" (Chip)	Sandstone, as above, common argillaceous matrix, even blue-white fluorescence and cut, slightly petriliferous odour; no stain.
4588'	¼"	Sandstone, light grey, fine-coarse grained, poorly sorted, subangular to subrounded, bright even bluish yellow fluorescence, common white argillaceous matrix, friable slightly petriliferous odour, good cut (bright bluish white)
4578	¼" (Chip)	Sandstone, brownish-grey, fine-medium grained, poorly sorted, moderate amount white clay matrix, no fluorescence, no odour, no cut.
4568'	L¼" (chip)	Sandstone, light grey, fine-medium grained, poorly sorted, moderate amount white clay matrix, good even yellow blue fluorescence and cut, good petriliferous odour, no stain
4565	L¼" (chip)	Sandstone, as above (4568')
4562	L 1/16" (chip)	Sandstone, light grey, fine grained, no fluorescence or cut, abundant clay matrix
4560	L 1/16" (chip)	Sandstone, as above (4562), no show
4558	¼" (chip)	Sandstone, light brown-grey, fine-medium grained, abundant clay matrix, friable, slightly dull faint yellow fluorescence slightly petriliferous odour, no cut
4557	½"	Sandstone, as above (4558) no fluorescence cut, slightly petriliferous odour.
4552	¼" (chip)	Sandstone, as above (4558) no fluorescence or cut, no odour
3850	1"	Mudstone, medium grey, smooth, soft, calcareous
3726	1¼"	Mudstone, as above
3558	1"	Mudstone, as above
3534	3/4"	Mudstone, as above
3492	3/4"	Mudstone, as above
3474	1"	Mudstone, as above
2900	1"	Mudstone, as above
2600	1 3/4"	Mudstone, as above

SNAPPER A-1 RUN NO. 6 SIDE-WALL CORES AUGUST 10, 1968.

Depth	Rec.	Description
5027	½"	Siltstone, firm, lite grey, very shaley with thin laminations of carbonaceous material. No show. Cut - yellow fluorescence probably from carbonaceous laminations.
5032	1¼"	Siltstone, firm - friable, lite grey, shaley, with scattered black carbonaceous flecks. No show.
5085	1"	50% Siltstone and 50% shale, firm, grey-dark grey, carbonaceous. No show.
5153	1¼"	Siltstone, soft, grey, shaley. No show.
5305	¾"	50% Shale and 50% siltstone, dark grey, micaceous. No show.
5616	1"	Shale, dark grey-brown, carbonaceous, micaceous with coal chips, very silty. No show.
5622	1"	Interlaminated coal and sandstone. Sandstone is very fine-fine grain, with uneven blue flucrescence. Sand grains in white sli dolomitic matrix. Poor cut. Weak oil show.
6197	1¼"	Shale, dark grey-brown, brittle with thin sand lamination No show.
6204	1"	Sandstone, soft-friable, grey, silt size to very fine grain, shaley with good uneven blue fluorescence. Carbonaceous laminae and flecks. Fair cut. Oil show.
6924	¾"	Sandstone, friable, grey, silt size to very fine grain, shaley. No show. Carbonaceous laminations. Cut very weak, pale yellow fluorescence. Weak oil show.
7334	1"	Shale, dark grey, carbonaceous. No show.
7607	½"	Siltstone, firm, grey, shaley, with carbonaceous laminations and flecks. No show.
7615	½"	Siltstone as above.
7696	½"	Shale, dark grey, firm, very silty, carbonaceous. No show.
7876	NR	Misfire.
8426	¾"	Sandstone, grey, firm, silt size to fine grain, shaley, with carbonaceous flecks. Very faint pale blue fluorescence. No cut. Gas show.
8447	¾"	Sandstone, firm, grey, silt size to fine grain, shaley, carbonaceous laminations and flecks with possible pin point fluorescence cut, uneven blue fluorescence. Weak gas show.
8449	¾"	As above with no show - no cut.
8513	¾"	Siltstone, grey, firm, carbonaceous, shaley. No show.
8583	¾"	Siltstone, grey, firm, carbonaceous laminations and flecks, shaley, with very faint pale fluorescence. No cut. Weak gas show.

Snapper -1

Depth	Rec.	Description
8764	Frag.	Sandstone, grey, silt size to very fine grain, carbonaceous flecks, shaley with uneven yellow fluorescence. No cut. Weak oil show.
8794	½"	Siltstone, grey, firm, carbonaceous, shaley. No show.
8804	NR	Lost bullet.
8981	NR	Lost bullet.
8991	NR	Lost bullet.
9001	NR	Lost bullet.

Snapper No. 1 Sidewall Cores December 11, 1968

Note: 10% diesel in mud giving strong odor.

Depth	Rec.	Description
12,284	NR	Failed to fire.
12,250	¼"	Siltstone, grey-dark grey, firm, very shaley, calcareous, carbonaceous. No show.
12,200	¼"	Sandstone, grey, firm, very fine grain to silt size, calcareous, slightly carbonaceous. Poor PęP. Fair bluish-white fluorescence. Weak cut. Gas.
12,144	¼"	Shale, dark grey to brown, firm, silty, slightly calcareous. No show.
12,100	¼"	Shale, dark grey to brown, firm, slightly silty, very slightly calcareous, slightly carbonaceous. No show.
12,046	3/4"	Sandstone, grey, firm, very fine grain to silt size, carbonaceous streak, clay matrix. Poor PęP. No show.
11,999	NR	Broken barrel.
11,935	½"	Sandstone, grey, firm, very fine grain to silt size, carbonaceous, slightly calcareous, few lithics, slightly clay matrix. Poor PęP. Uneven faint blue-white fluorescence. Fair cut. Gas.
11,933	NR	Missfire.
11,900	¼"	Shale, dark grey-brown, silty, slightly calcareous. No show.
11,870	¼"	Shale as above.
11,844	¼"	Sandstone, grey, firm, very fine grain to silt size, carbonaceous streaks, slightly calcareous, slightly clay matrix. Very faint blue-white fluorescence. Weak cut. Poor PęP. Gas.
11,826	Fragments	Sandstone, grey, firm, very fine grain to silt size, very shaley, carbonaceous, clay matrix. calcareous. No fluorescence. Possibly weak faint cut. Tite.
11,818	NR	Broken barrel.

11,782	Fragments	Shale, dark grey to brown, firm, carbonaceous, slightly silty, slightly calcareous. No show.
11,737	NR	Broken barrel.
11,665	NR	Broken barrel.
11,638	¼"	Shale as above.
11,610	½"	Sandstone, grey, firm, very fine grain to silty size, carbonaceous, shale streaks, slightly clay matrix. Poor P¢P. Faint blue-white fluorescence. Weak cut. Gas.
11,538	Fragments	Shale as at 11,638.

CORE DESCRIPTIONS

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

1/31 X 519

Use PP BY BAROID

Core No. 1

WELL: Snapper A-1

Interval Cored 4060-4090 ft., Cut 30 ft., Recovered 8" ft. (%) Fm. Latrobe

Bit Type C-20 , Bit Size 8 19/16 in., Desc. by HL Date 31 May 68

Depth & Coring Rate (min./ft.)	Graphic (1" - 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8 10 4060 65 70 75 80 85 90		☼		Sandstone; grey - dark grey, m - c. grn., w/few granules, sli micaceous, few dark lithics, & carb flecks. Very hard and massive. 80% qtz grains, clear - frosted, ea - sr. Sli dolo cement. No fluor. No cut. Poss faint odor. PEP poor to none.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

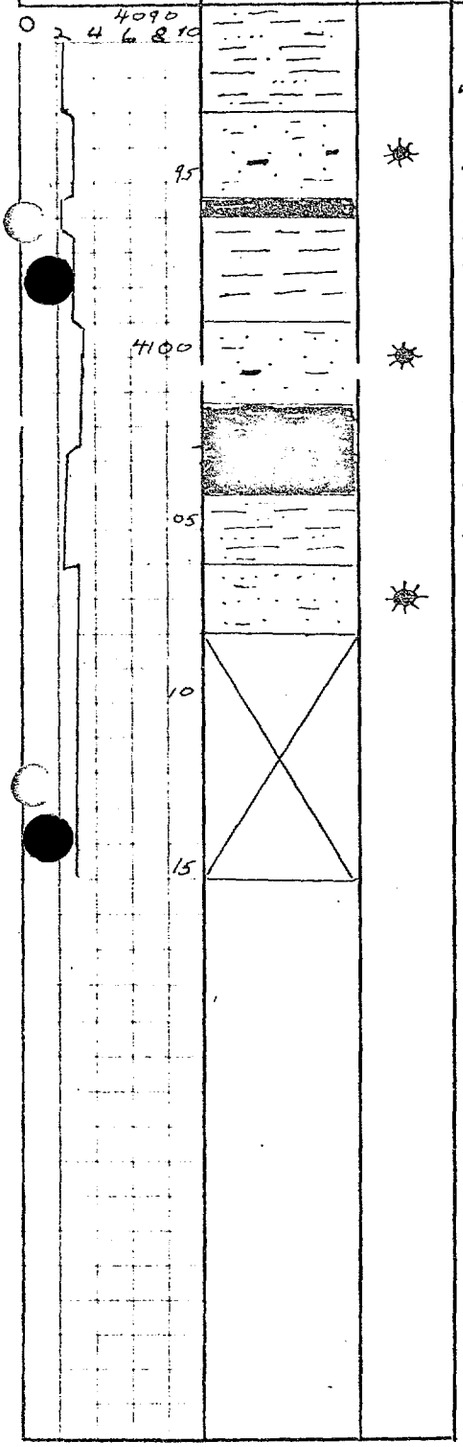
CORE DESCRIPTION

Core No. 2

WELL: Snapper A-1

Interval Cored 4090 - 4115 ft., Cut 25 ft., Recovered 18 ft., (72 %) Fm. Latrobe

Bit Type C-20 , Bit Size 8 15/16 in., Desc. by H.L. Date 31 May 68



Interval (ft.)	Descriptive Lithology
4090 - 93	Shale, dark grey - black, very carbonaceous, silty, with scattered bands coarse grain sand. Firm - hard.
4093 - 95½	Sandstone, gry - gry brown, m - c grain; w/some granule and fine grain. Clear - frosted, sa - sr, very shaley, very carb, w/coal frags, thin discontinuous streaks coal & shale
4095½ - 96	Coal, black, brittle, w/ small discontinuous band of c. grn sand.
4096 - 99	Shale, a a, & w/ thin discontinuous bands of silt. Scattered small sand-filled burrows.
4099 - 4101½	Sandstone, a a
4101½ - 4104	Coal, black, brittle
4104-06	Sand, a a
	Coal and sand broken in barrel.
	No fluor. Good gas odor & taste. Weak - fair cut, w/uneven v. pale yel fluor. P & P poor to fair.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

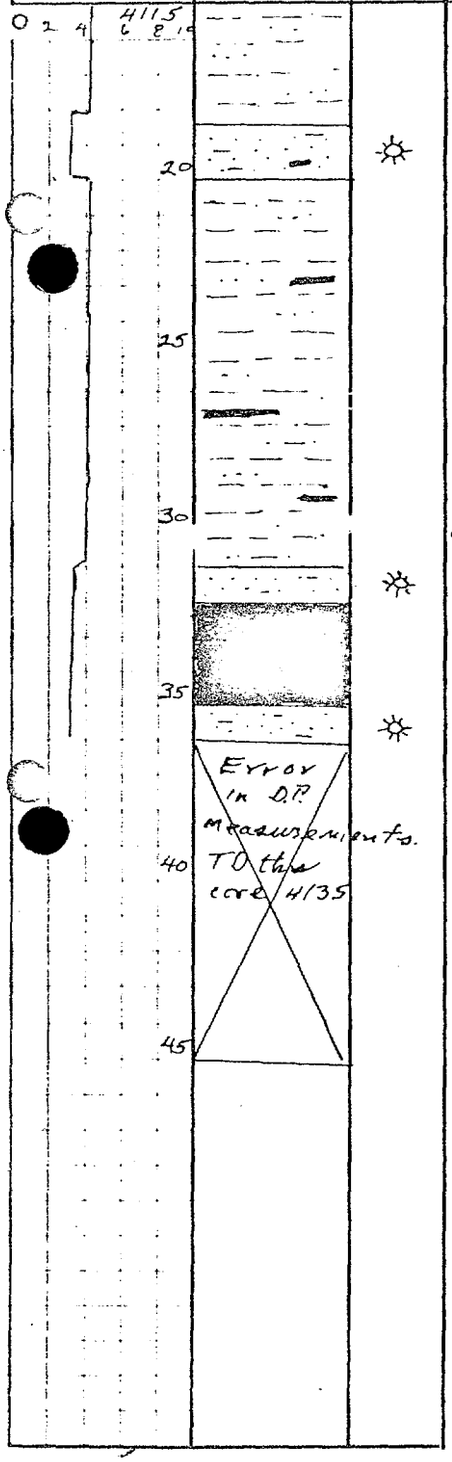
3/31

Core No. 3

WELL: Snapper A-1

Interval Cored 4115 – 4135 ft., Cut 20 ft., Recovered 20 ft., (70 %) Fm. Latrobe

Bit Type C-20 , Bit Size 8 15/16 in., Desc. by HL Date 1 June 68



Interval (ft.)	Descriptive Lithology
4115 – 18½	Shale, dark grey – black, hard, silty, carbonaceous & micaceous, w/ even parallel & discontinuous lam of silt Scattered bands of m – c grain sand & sand-filled burrows
4118½ – 20	Sandstone, dark grey – brown, m – c grn, clear-frosted, sa – sr, very shaley, very carb, large coal frags. Firm – unconsol.
4120 – 31	Shale aa and interbedded w/ coal.
4131 – 32	Sandstone, aa except grain size change to v. fine – silty.
4132 – 35	Coal, black, brittle.
4135 – 36	Sandstone aa 4131 – 32.
	Coal and sandstone broken in barrel.
	No fluor. Fair to good odor & taste. Weak cut. P & P poor to fair

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

4/31

Core No. 4

WELL: Snapper A-1

Interval Cored 4135 - 4160 ft., Cut 25 ft., Recovered 22 ft., (87 %) Fm. Latrobe

Bit Type C-20 , Bit Size 8 15/16 in., Desc. by H.L. Date June 1, 68

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8 10 4135			4135-4142	Sandstone, grey, vf - m grn, clear - frosted, sa-sli micaceous, argillaceous. Scatter coal chips. Soft to unconsolidated. Scat pyrite. 90% qtz. Massive.
40			4142-43	Shale, grey - black, silty, hard. Numerous, even parallel & discontinuous laminae of silt and v.f. grn sand. Sand-filled burrows.
45			4143-46	Coal, black, hard to brittle.
			4146-47	Shale, grey-brown, silty, carb, hard.
50			4147-57	Sandstone, lt. gry, v f grn - silt size, w/few scat m-c grn, c-f, sa-sr, micaceous, tr. pyrite, argillaceous. Soft to unconsolidated. 70-90% qtz. Massive. From 4165-67 Silt size dominant. At 4162, 3" of banded shale & silt, showing ripple marks. At 4167, 2" on bottom a shale, olive grey, waxy, hard-brittle carbonaceous.
55				No fluor. Good odor & taste. Weak cut w/ uneven pale fluor. P&P poor to good
60				

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

5/31

Core No. 5

WELL: Snapper A-1

Interval Cored 4160 - 86 ft., Cut 26 ft., Recovered 9 ft., (33 %) Fm. Latrobe

Bit Type C-20, Bit Size 8 15/16 in., Desc. by H.L. Date June 3 68

Interval (ft.)	Descriptive Lithology
4160 - 63	Coal, black, hard - brittle.
4163 - 68	Shale, olive - grey brown, silty, carbonace few coal laminae horizontal & vertical, coal chips, sli micaceous. Firm - brittle.
4168 - 69	Sandstone, grey, v.f. grain to silt size, c - f, sa - sr, numerous shale & carb lam, sli micace Unconsolidated. The sand is very clean.
	Good odor & taste. No fluor. Very weak cut. P&P ge

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 6

WELL: Snapper A-1

Interval Cored 4186 - 4228 ft., Cut 42 ft., Recovered 6" (1 %) Fm. Latrobe

Bit Type C-20, Bit Size 8 5/16 in., Desc. by H. L. Date June 3, 68

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 4186 90 95 4200 05 10 15 20 25 4228				6" Shale, brown - black, carbonaceous, w/ numerous coal lams & frags, sli silty & micaceous. Strong odor, bleeding gas, no fluor. Error on driller. Over cored by 12 ft.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

7/31

Core No. 7

WELL: Snapper A-1

Interval Cored 4228 - 4258 ft., Cut 30 ft., Recovered 27 ft., (90 %) Fm. LATROBE

Bit Type C-14A , Bit Size 8 5/16" in., Desc. by H.L. Date June 4, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 5 10 15 4228 20 30 35 40 45 50 55 58			4228-30	Coal, black, hard, brittle.
			4230-31	Shale, brown - black, carbonaceous, sli micaceous, hard - brittle.
		☼	4231 - 4233	Shale, ltgrey - dark grey, laminated and burrowed, in - filled with silt & v.f. grn. sand & carb material.
		☼	4233 - 4245	Sandstone, grey, v.f. to m grn, w/few scat c. grn. c-f, sa-sr, micaceous, scattered carb flecks. Unconsol friable With the sand, from 4239 - 4243, interbedded, Shale, sltst and Siltstone, shaley; ltgrey - drk gry, laminated, burrowe Total 10 feet sand in this unit.
			4245 - 4255	Shale, dark gry - lt gry, laminated, burrowed infilled w/silt, churned & wavy, sli micaceous. Within this unit, from 4547 - 4550, Coal, black, hard to brit. From 4253½ - 4255, shale non - laminated.
				Strong odor gas & taste. No fluor. Weak to Fair cut w/ v. pale, uneven fluor. P&P good.

REMARKS.

CORE DESCRIPTION

8/31

Core No. 8

WELL: SNAPPER A-1

Interval Cored 4258-4288 ft., Cut 30 ft., Recovered 21 ft., (70 %) Fm. LATROBE

Bit Type CHRISTENSEN, Bit Size 8 5/16 in., Desc. by GENTILE & HICKS Date 5 JUNE 68

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
O 2 4 8 16 32				
				1' Sandstone very silty, gy to lt gy, vf to slt size qtz., w srtd, sl fri, carb, mica, w/ sh lam, & abdt burrows, sm scale X-lam,
				2' Coal, blk, brittle, conc frac.
				1' ss, f grn, aa, w/ occ c grn, wavy sh lam, carb, some clay plugging
				5½' ss. (as in top 1') grad. contact w/ abdt sd. filled burrows at base
10'				2½ sh, v dk brn gy, sl fis, occ sd filled burrow, abdt sd filled burrows @ base 3" band v carb @ base
				2½' ss. lt gy, vf grnd, sub rd, w srtd, wavy carb lam, occ faint sm scale X-lam, occ faint burrow, fr ◊ & dk abdt sh lam @ base
				½' coal black, brittle, conc. frac.
				3' sh, dk brn gy, occ thn coal lam, occ sd filled burrow
20'				3' ss Upper 1½' buff, vf, sub ang to sub rd, mica, thn carb lam, g ◊.
				Lower 1½' bf, m-c, sub ang to sub rd, fr to w srt 5% lithics, g to ex visual ◊ g k, no stn or cut
30				

REMARKS: CORE 8 had good odor & taste, No fluor, weak cut, w/ halo of v pale fluor.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

9/31

Core No. 9

WELL: SNAPPER ~~A~~ 1

Interval Cored 4288 - 4318 ft., Cut 30 ft., Recovered 21 ft., (70 %) Fm. LATROBE

Bit Type CHRISTENSEN , Bit Size 8 5/16 in., Desc. by GENTILE & HICKS Date 5 JUNE 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 8 16 32			21'	sandstone, buff, med.-coarse grained, occassionally very coarse grained, ang-subrd, moderately sorted, very friable - unconsolidated, traces diss. pyrite, excellent visual ϕ & k weak cut. "Overall sand is not graded, there are very thin interbands (≈1") of coarse and granular sands."
10				
20				
30				

REMARKS: Core 9 had fair odor immediately out of barrel; good taste, weak cut.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

10/31

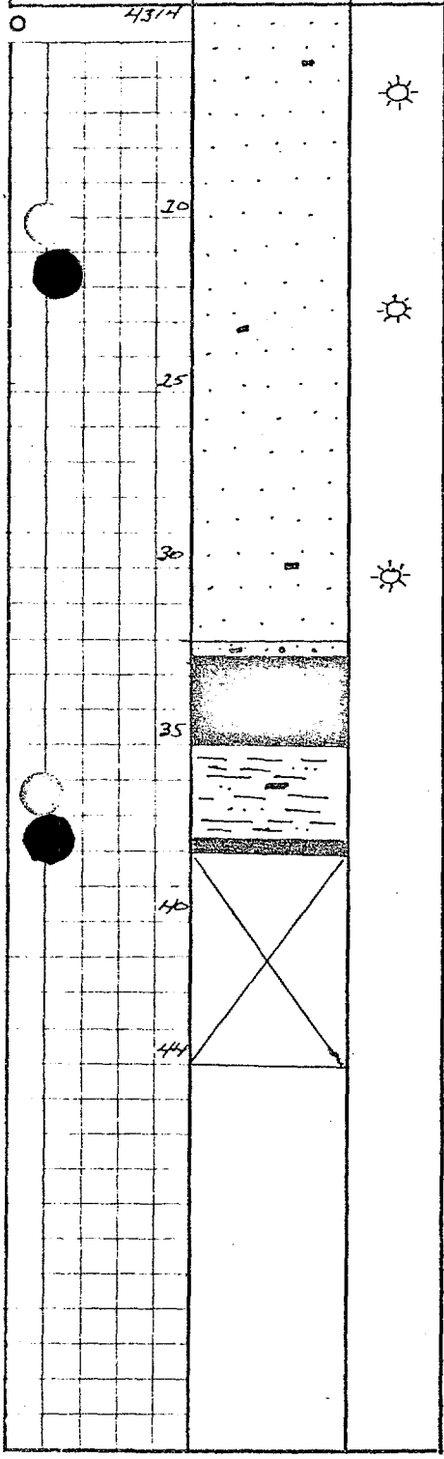
Core No. 10

WELL: Snapper A-1

Interval Cored 4314-44 ft., Cut 30 ft., Recovered 24 ft., (71 %) Fm. Latrobe

Bit Type C-20, Bit Size 8 5/16 in., Desc. by HL Date June 18, 1968

5% Diesel in mud.



Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
		☼	4314 - 4332	Sand; light grey, very fine - fine grain, unconsolidated, w/rare medium grain & rare mica & coal frags. Good sorting, very little matrix. Massive. Good Φ & K. No fluor. Strong diesel odor. Gas sand.
		☼	4332 - 4332 ½	Sandstone; grey - brown, firm - friable, fine - medium grain, clear - frosted, sa - sr, few coarse grains, few coal frags, lithics, micaceous. 10-20% Clay matrix, grey, sli dolomitic. Poor sorting. Fair Φ & K. No fluor. Strong diesel odor. Weak cut giving v. pale uneven fluor. Gas sand.
		☼	4332 ½ - 4335	Coal; black, hard - brittle. Bleeding gas.
			4335 - 4337 ½	Shale; dark grey, hard, carbonaceous, with parallel discontinuous laminae filled w/silt & very fine grain sand.
			4337 ½ - 4338	Coal, black, hard - brittle.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

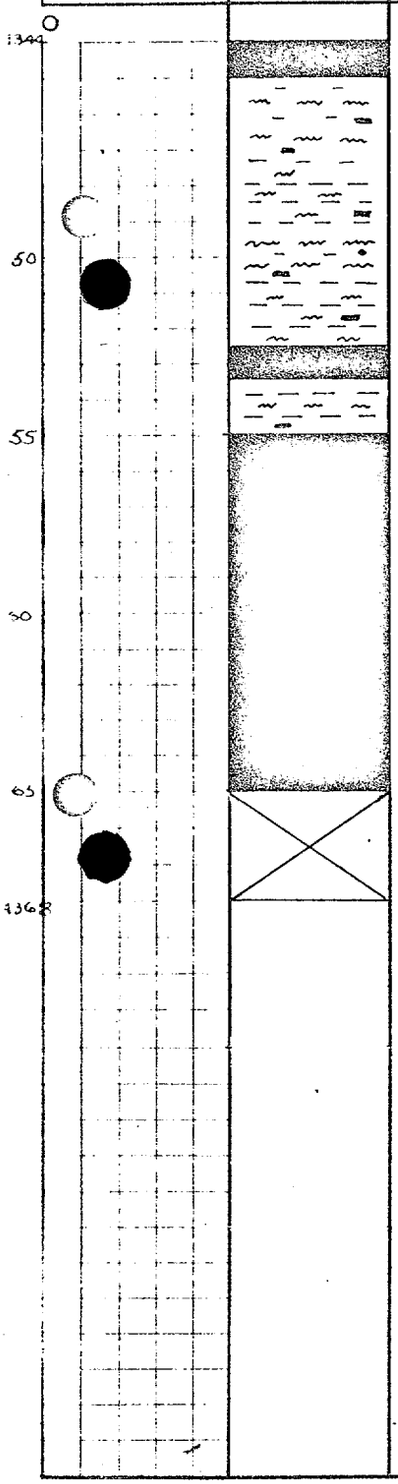
11/31

Core No. 11

WELL: SNAPPER A-1

Interval Cored 4344-4368 ft., Cut 24 ft., Recovered 21 ft., (87.5 %) Fm. LATROBE

Bit Type C-8, Bit Size 8 5/16 in., Desc. by D.W.W R.S. Date JUNE 19, 1968



Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
			4344 - 4345 1'	Coal: grading from black, massive with shiny lustre and conchoidal fracture to dull black, fissile very shaly coal with imprints of plant fragments.
			4345 - 4355 10'	Interbedded siltstone and mudstone with several thin coal seams. Either siltstone or mudstone may predominate over short intervals. Siltstone: light grey to brown grey, firm, quartzose with some very fine sand grains, carbonaceous material scattered throughout with some concentrations providing lamination, orgillaceous, appears tight, trace of pyrite. core analysis indicates good porosity Mudstone: brown grey to dark brown, firm, silty, micromicaceous, very carbonaceous with flecks scattered throughout and some horizontal laminae defined by elongated carbonaceous stringers. Both the mudstone and siltstone are commonly burrowed, burrows often infilled with cleaner appearing, less carbonaceous siltstone and very fine sandstone, laminations often disrupted by vertical burrows. Coal: as 4344 - 4345
			4355 - 4365 10'	Coal: black, conchoidal fracture, orgillaceous in part, generally dull appearance.
			4365 - 4368 3'	Lost core

REMARKS: Coring rate uncertain as later revised total depth of core from 4374 to 4368

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

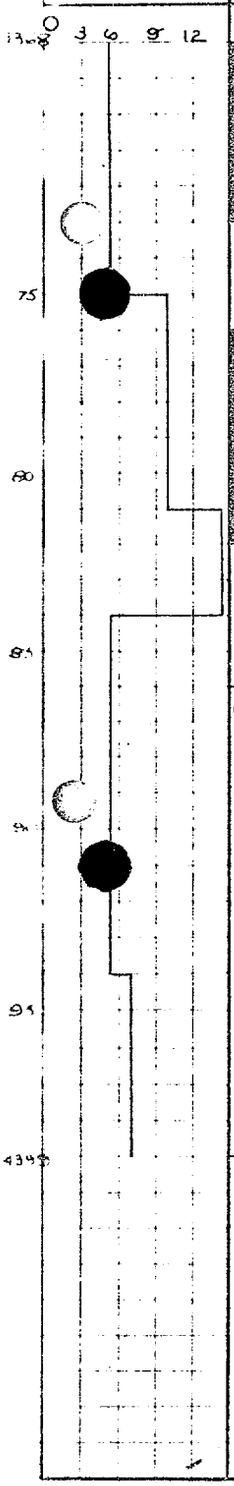
12/31

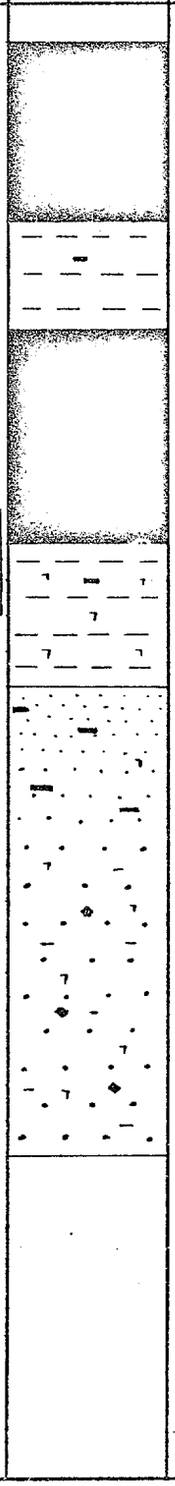
Core No. 12

WELL: SNAPPER A-1

Interval Cored 4368 - 4399 ft., Cut 31 ft., Recovered 31 ft., (100 %) Fm. LATROBE

Bit Type C-8, Bit Size 8 5/16 in., Desc. by DWW. RS Date JUNE 19, 1968





Shows

Interval (ft.)	Descriptive Lithology
4368 - 4373 5'	Coal: dark brown to black, hard, conchoidal fracture, dull earthy to bright vitreous lustre
4373 - 4376 3'	Mudstone: medium grey to grey brown, firm, non calcareous, some smooth slickensiding surfaces, weakly carbonaceous with several coaly seams
4376 - 4382 6'	Coal: black, hard and brittle, conchoidal fracture, dull to shiny vitreous lustre.
4382 - 4386 4'	Mudstone: light to medium grey, firm, micromicaceous, non calcareous, rare carbonaceous plant imprints
4386 - 4399 13'	Sandstone: light grey, quite firm at top of sand but becoming softer and crumbling readily between the fingers at the base, grain size varies from very fine at the top through medium grained to coarse to very coarse at the base, moderately well sorted, subangular to subround, quartzose with small number of black coal(?) chips throughout, micaceous, fine carbonaceous laminae often exhibiting small ripples in upper portion of sand, unit becoming massive at base trace of disseminated pyrite as well as concretions, argillaceous matrix which may reduce porosity, porosity and permeability appear good, no fluorescence.

Average penetration rate 6.5 minutes per foot

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

13/31

Core No. 13

WELL: SNAPPER A-1

Interval Cored 4399-4427 ft., Cut 28 ft., Recovered 0.5 ft., (2 %) Fm. LATROBE

Bit Type C 8 , Bit Size 8 5/6 in., Desc. by D.W.W. R.S. Date JUNE 20, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8			4399 - 4399.5 0.5'	Sandstone: grey brown, coarse to very coarse, subangular to subround, well sorted, quartzose with a trace of coal chips scattered throughout, very slightly micaceous, soft and breaks up readily, mainly massive in appearance but there are several horizontal carbonaceous laminae, slightly argillaceous, good porosity and permeability, no fluorescence, possible weak cut.
4399				
05				
10				
15				
				Core washed away
20				
				Average penetration rate 7 minutes per foot
				Heavy torque belled bottom stabilizer and ring grooved bit owing to junk in hole
4427				

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

14/31

Core No. 14

WELL: SNAPPER A-1

Interval Cored 4427 - 4437 ft., Cut 10 ft., Recovered 0.0 ft., (0 %) Fm. LATROBE

Bit Type C 20, Bit Size 8 5/16 in., Desc. by D.W.W. R.S. Date JUNE 20, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
4427				No recovery Total coring time 1½ hours Average coring rate 9 minutes per foot
4437				

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

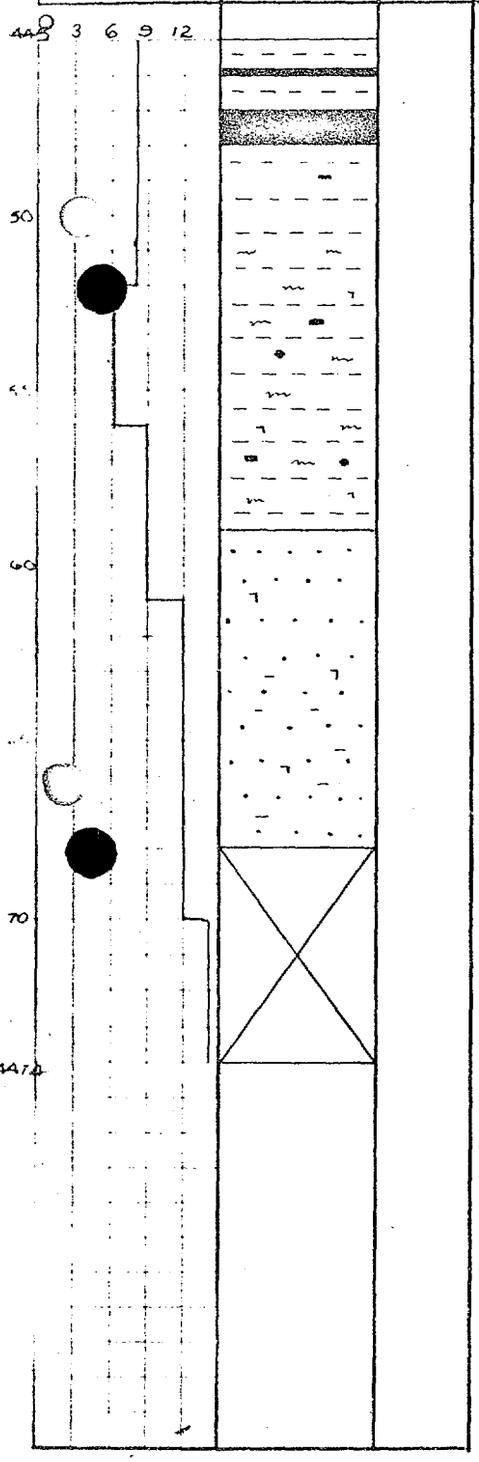
15/31

Core No. 15

WELL: SNAPPER A-1

Interval Cored 4445 - 4474 ft., Cut 29 ft., Recovered 23 ft., (79 %) Fm. LATROBE

Bit Type C 8 , Bit Size 8 5/16 in., Desc. by DWW RS Date JUNE 21, 1968



Interval (ft.)	Descriptive Lithology
4445 - 4447 2'	Mudstone: light yellow brown, firm, non calcareous, very slightly micromicaceous, carbonaceous
4447 - 4448 1'	Coal: dark brown to black, finely laminated, argillaceous, conchoidal fracture, shiny to dull earthy appearance
4448 - 4450 2'	Mudstone: light olive grey, firm, non calcareous, carbonaceous, massive
4450 - 4459 9'	Mudstone with thin siltstone interbeds, light to dark brown grey, laminated appearance due to color variation, siltstone beds are light colored, black carbonaceous laminae with pyrite associated in some cases, laminations vary from horizontal to approximately 8°, non calcareous, silty, carbonaceous, burrowed, burrows more numerous towards top of unit and often infilled with lighter colored non carbonaceous material, micaceous.
4459 - 4468 9'	Sandstone: light grey to brown grey, very friable, medium to pebble size with coarse to very coarse dominant, sub angular to sub round, poor to moderate sorting, essentially quartzose with a trace of coal chips, slightly micaceous, good porosity and permeability, no fluorescence, slightly argillaceous.
4468 - 4474 6'	Lost core

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

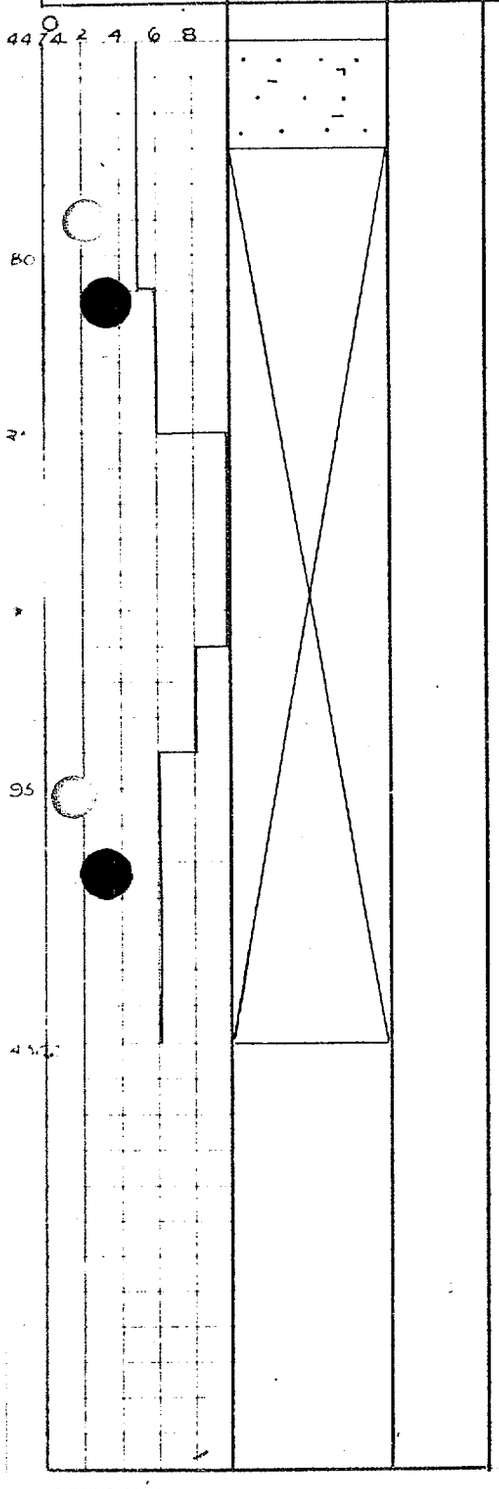
16/31

Core No. 16

WELL: SNAPPER A-1

Interval Cored 4474 - 4502 ft., Cut 28 ft., Recovered 3 ft., (11 %) Fm. LATROBE

Bit Type C 8 , Bit Size 8 5/16 in., Desc. by D.W.W. R.S. Date JUNE 21, 1968



Interval (ft.)	Descriptive Lithology
4474 - 4477 3	Sandstone: light grey, massive, very friable, coarse to pebble size, mainly coarse to very coarse, sub angular to subround, poor to moderate sorting, quartzose, argillaceous, slightly micaceous, good porosity and permeability, no fluorescence, good odor.
4477 - 4502 25'	Lost core

REMARKS:

Core 17.

WELL: SNAPPER A-T1 17/31

Interval Cored 4502 - 4546 ft., Cut 44 ft., Recovered 22 ft., (50 %) Fm. LATROBE

Bit Type C 8 , Bit Size 8 5/16 in., Desc. by DWW RS Date JUNE 21, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows	Interval (ft.)	Descriptive Lithology
0 3 6 9 12			4502 - 4502.5 0.5'	Sandstone : light brown grey, firm, medium grained to pebble size, poor sorting, sub angular to sub round, micaceous, argillaceous, good porosity and permeability, no fluorescence.
			4502.5 - 4503.5 1'	Shale : dark brown grey, firm., micaceous, carbonaceous, non calcareous, coarse floating sand grains, small patches of medium sand possibly infilled burrows
			4503.5 - 4513 9.5'	Sandstone : light grey, moderately firm to friable, massive, quartzose with a trace of coal chips, medium to coarse grained, subangular to subround good sorting, micaceous, a few pyrite blebs, good porosity and permeability, no fluorescence
			4513 - 4522 9'	Sandstone : light brown grey to dark brown grey and black, moderately firm, fine grained, sub angular to subround, moderate sorting, micaceous, argillaceous, carbonaceous streaks and laminae occassional very shaly and carbonaceous intervals, extensively burrowed, burrows often infilled with lighter colored sand, fair porosity and permeability, patchy blue fluorescence from 4518.
			4522 - 4523 1'	Sandstone: brown, firm, medium to coarse grained with occassional pebble, poor sorting argillaceous, micaceous, carbonaceous, fair porosity and permeability, pin point blue fluorescence
40			4523 - 4524 1'	Shale : black, carbonaceous, firm, micaceous silty, pyritic, extensively burrowed, burrows infilled with fine to coarse grained sand.
REMARKS:				
4546			4524 - 4546	Lost core : core may have been lost at top rath

ESSO STANDARD OIL (AUSTRALIA) LTD.

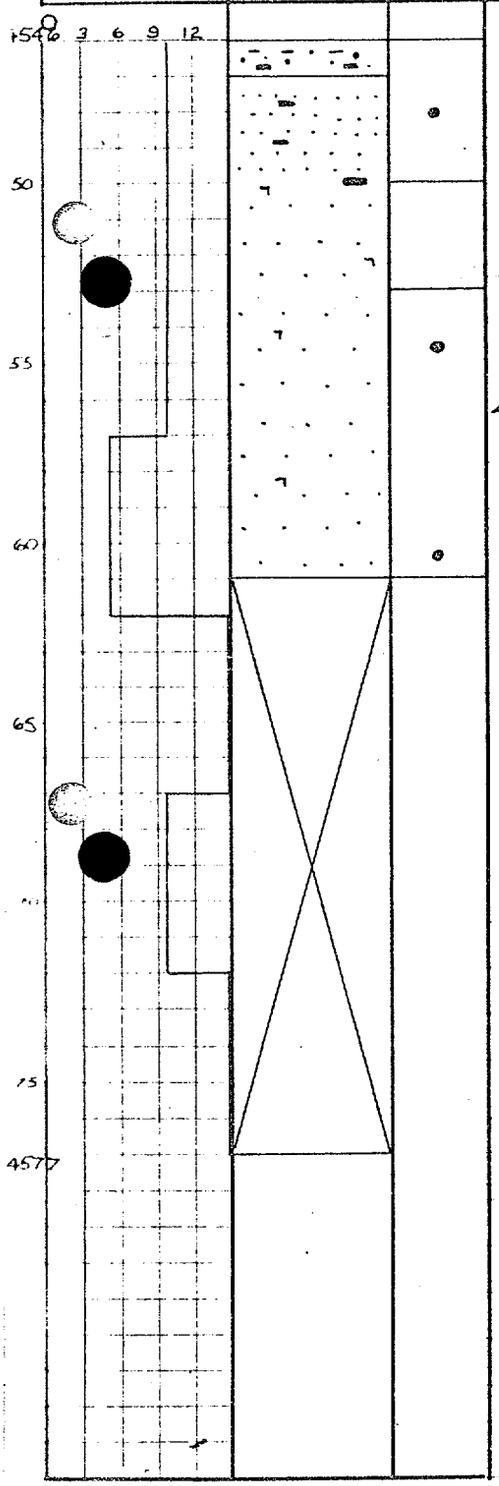
CORE DESCRIPTION

Core No. 18

WELL: SNAPPER A-1

Interval Cored 4546-4577 ft., Cut 31 ft., Recovered 15 ft., (48 %) Fm. LATROBE

Bit Type C 20, Bit Size 8 5/16 in., Desc. by D.W.W. R.S. Date JUNE 22, 1968.



Interval (ft.)	Descriptive Lithology
4546-4547 1'	Sandstone: dark brown grey, firm, fine to very coarse grained, subangular to subround, poor sorting, extensive shaley and carbonaceous laminae, burrowed, fair porosity and permeability, uneven patchy blue fluorescence confined to infilled burrows and sandstone laminae, fair cut. One 4" grey silty mudstone interbed
4547-4561 14'	Sandstone: light grey to brown grey, moderately firm to very friable, fine - medium - coarse grained, quartzose, subangular to subround moderately well sorted, fine grained with carbonaceous laminae and evidence of burrowing in upper 3 feet otherwise massive, excellent porosity and permeability, 4547-4550 fair fluorescence and fair cut 4550-4553 no fluorescence and no cut, 4553-4561 solid bright blue fluorescence and excellent cut micaceous, argilloceous in part.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

19
31

Core No. 19

WELL: SNAPPER A-1

Interval Cored 4577 - 4607 ft., Cut 30 ft., Recovered 14' ft., (47 %) Fm. LATROBE

Bit Type C 20 , Bit Size 8 5/16 in., Desc. by D W W R S Date JUNE 23, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
457 0 3 6 9 12				
			4577 - 4580 3'	Sandstone: brown grey, unconsolidated, quartzose coarse to very coarse, subangular to sub round, good sorting, good porosity and permeability, feels oily, good blue fluorescence, good cut, good odor.
80				
85			4580 - 4588 8'	Shale: light brown grey to dark brown grey, firm, lamination due to color alternation, micaceous, carbonaceous streaks, plant (leaf?) imprints on bedding surfaces, pyritic blebs and occassionally pyrite along laminae, non calcareous.
90				
95			4588 - 4591 3'	Sandstone: brown grey, unconsolidated except for 4" piece in core catcher, quartzose, medium to coarse grained, subangular to sub round, good sorting, argillaceous, good porosity and permeability, good fluorescence, good cut, good odor.
460				
05				
4607				

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

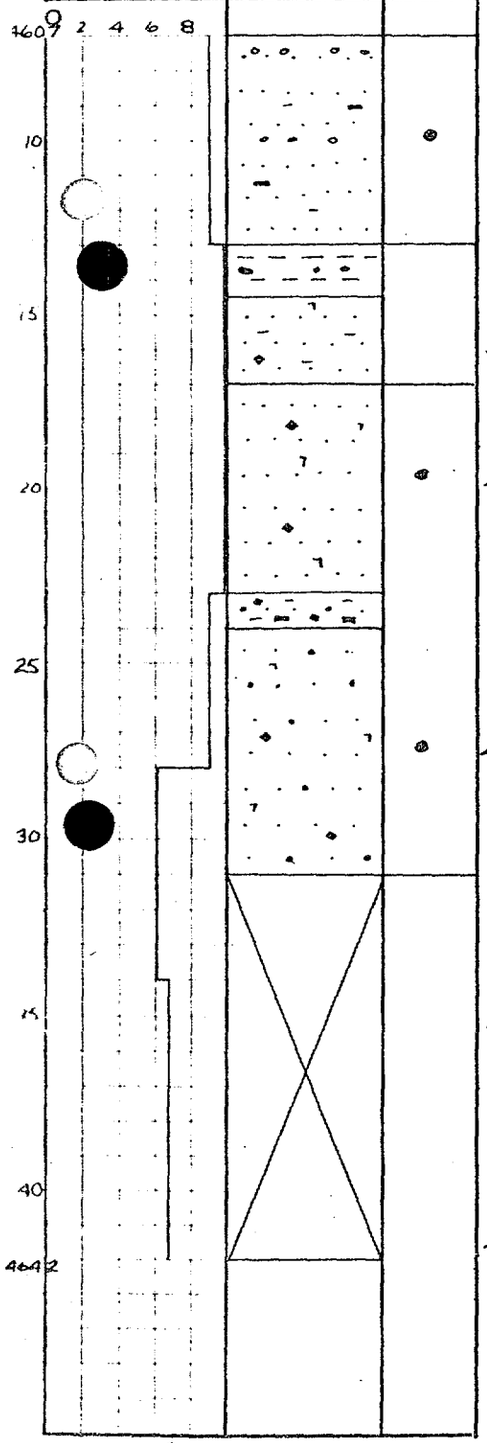
20

Core No. 20

WELL: SNAPPER A-1

Interval Cored 4607 - 4642 ft., Cut 35 ft., Recovered 24 ft., (69 %) Fm. LATROBE

Bit Type C 20 , Bit Size 8 5/16 in., Desc. by D.W.W. R.S. Date JUNE 24, 1968.



Interval (ft.)	Descriptive Lithology
4607 - 4613 6'	Sandstone: light grey, firm, quartzose, very fine to fine grained, subangular to sub round, well sorted, argillaceous in part, a few carbonaceous streaks, pebble beds with subround quartz pebbles, massive, good porosity and permeability no fluorescence to faint spotty blue fluorescence
4613 - 4614.5 1.5'	Shale: light grey and dark brown, firm, firm, non calcareous, carbonaceous, pebble interbeds,
4614.5 - 4617 2.5'	Sandstone: light grey with light brown grey laminae, laminae at about a 10° angle, firm, fine to medium grained, argillaceous, micaceous, pyritic, occassional pebble bed, fair porosity and permeability, no fluorescence noted
4617 - 4623 6'	Sandstone: light grey, very hard, massive, quartzose, fine to medium grained, subangular to subround, good sorting, disseminated pyrite, trace black (coal?) grains, micaceous, fair porosity and permeability, spotty blue fluorescence, faint cu
4623 - 4624 1'	Sandstone: dark brown grey, firm, fine to very coarse grained, poor sorting, very argillaceous and carbonaceous, very pyritic, poor porosity and permeability, very spotty pin point fluorescence.
4624 - 4631 7'	Sandstone: light grey, very hard, fine to very coarse grained with some pebble size, poor sorting, sub angular to sub round, quartzose argillaceous, micaceous, pyritic-disseminat massive, good to fair porosity and perm spotty fluorescence, faint cut.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

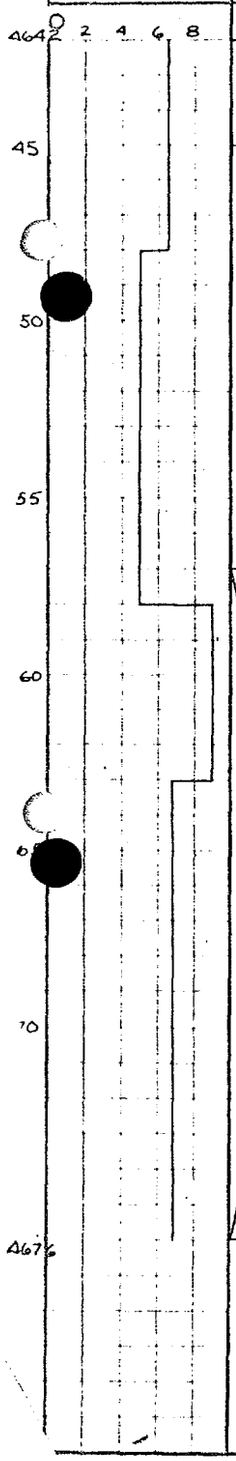
21/31

Core No. 21

WELL: SNAPPER ~~A-1~~

Interval Cored 4642 - 4676 ft., Cut 34 ft., Recovered 15 ft., (44 %) Fm. LATROBE

Bit Type , Bit Size 8 5/16 in., Desc. by D.W.W. R.S. Date JUNE 24, 1968



Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
			4642 - 4645 3'	Sandstone: light grey, hard, fine grained, quartzose, subangular to subround, moderately well sorted, micaceous, disseminated pyrite, mainly massive with occassional carbonaceous laminae at angles of 10-15°, good porosity and permeability, no fluorescence
			4645 - 4657 12'	Sandstone: light grey with some brown grey, firm, silty and argillaceous, particularly in upper portion where prominently laminated due to color alternation and appearing burrowed and with some cross bedding, grades down to where only carbonaceous laminae and is essentially massive at base of core, micaceous, disseminated pyri and pyrite blebs, fair to good porosity and permeability, no fluorescence, very fine to fine gra

REMARKS:

CORE DESCRIPTION

Core No. 22 — 22/31

WELL: SNAPPER A-1

Interval Cored 5884-5915 ft., Cut 31 ft., Recovered 31 ft., (100 %) Fm. LATROBE

Bit Type C-20, Bit Size 8 5/16 in., Desc. by R.V. Hicks Date 17 JULY 1968

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8				
5884			1'	siltstn, v. arg, sdy, v lt brn gy, w/mot wh specks. f disim carb mat. wavy discontinuous lam & occ burrow.
			3'	ss, some interstitial clay, bf-vlt gy. vf-f, sub ang to sub rd, occ v thn carb bed, wavy carb lam, w/ blu wh flour along lam p. crush cut. v faint X-lam,
			3'	ss massive, bf-lt gy, vf-f, sub ang to sub rd, w srtd, mod hd, scat. carb mat. some cly intstl, occ carb lam, faint large X-bed. w/scat pp dull blu wh flour & poor cut assoc. w/ clay.
			8"	shale gy blk, v carb, fis hd
			4"	coal
			11'6"	ss, lt gy, vf-f, sub ang to sub rd, w srtd m hd sl mica, some cly intstl, disim carb mat. NS inc f grading down occ v thn sh lam
5900			8'6"	siltstn, lt gy, slt: vf gr qtz, wavy sh lam, and abdt burrows, carb sh lam inc downward,
			3'	sh, dk brn gy. carb w/ plt debris, w/ wavy slt lam & occ slt & sd filled burrow becomming v carb at base
5915				

REMARKS: Flour appears to be associated w/ carb lam and confined hold by clay. Interpreted: hydrocarbon was forced from rich c... lam and bound up in intstl clay in sand bedding lam.

CORE DESCRIPTION

Core No. 23

WELL: SNAPPER ~~A2~~ 1

Interval Cored 6746-6755 ft., Cut 9 ft., Recovered 9 ft., (100 %) Fm. LATROBE

Bit Type C-20, Bit Size 8 5/16" x 4" in., Desc. by R.L. GRAHAM Date 20/7/'68

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8 10			6746'-6750'	Siltstone: lt grey, qtzose, clay choked, sub-ang—subround, well sorted, tr. glauc, tr. py., tr. mica, w/fine irreg. interbeds of carbon. matl (carbonized leaf remains), porosity + perm. poor. Min fluor. only.
			6750'-51'	Shale: v.silty, dk grey, poor fissility, carbon., w/ fine interbeds of lt grey siltstone. Min. fluor. only: No cut.
			6751'-52'	Siltstone: shaly as for 46'-50'.
			6752'-54'	Shale: as for 6750'-51'
			6754'-55'	Siltstone—v.f.gr. sandstone: similar to 6746'-6750'

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

24/31

Core No. 24

WELL: SNAPPER A-1

Interval Cored 7748-7777 ft., Cut 29 ft., Recovered 26 ft., (90 %) Fm. L.V.

Bit Type Diamond , Bit Size 8 5/16" in., Desc. by W. H. Nixon Date July 26, 68

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0			7748 - 51.5	Carbonaceous Silty Mudstone : dk gry , v. hard - well compacted ; m. micaceous, Abundant coaly flecks : becomes more silty downward, rare possible burrows , Cb. plant remains on bdg surfaces.
50			7751.5 - 53	Ss : lt gry brn vf - c.g. , generally well sorted coarse grains occur in discontinuous bands, a-r, Well lithified, Kaol mtrx Wavy continuous shaly coal laminae & Occ. discontinuous coal veinlets Coal is black, brittle, anthracitic; Occasional slight HC. in ss adj to veinlets
55			7753 - 54	Interlam Silty Mudst & ss
				ss: lt gry, f-mg, Kaol mtrx, flecks of kaol dissem throughout suggest alteration after felspar. : burrowed :
60			7754 - 61.5	Argill Slst : lt brn gry - ol gry : v tough & compact coalified plant remains : fairly extensively burrowed locally with sandy lenses marking burrowing 6" tk sand lense at 7760'
65			7761 - 63.5	Int. ss & silty mudst as in 53-54 int (burrowed)
			7763.5 - 64	Silty Mudstone : dk brn gry, carbon., mm, coaly plant remains (burrowed)
70			7764 - 65 :	Ss & Mudstone : aa , extensively churned & burrowed : much coaly plant remains
			7765 - cc :	Arg Slst : lt brn gry - ol gry as in 54-61.5
			7766 - 69 :	Ss : lt brn gry : f-c.g. extensively churned & reworked : Abund carbonaceous debris , pyrite nodules to 1/2" across . Much Kaol matrix, mica, non calc lower contact gradational
75			7769 - 74 :	(Interval fell from barrel, jumbled) Silty Mudst : dk brn gry - dk ol gry : very tough - well compacted : Coaly plant remains as above, occ leaf impressions on bdg surfaces . In part discont silty sandy lensoid masses marking burrowing ; Some dk brn gry layers v. rich in carbonaceous material grading to coal
77				

REMARKS: Canned samples : S @ 7759.5
P @ 7772

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 25

WELL: SNAPPER ~~A-1~~

Interval Cored 8467-98 ft., Cut 31 ft., Recovered 31 ft., (— %) Fm. L.Y.

Bit Type DIAMOND, Bit Size 8 3/16 in., Desc. by WHNIXON Date JULY 29-68

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows & Structures	Interval (ft.)	Descriptive Lithology
67 0			8467-80	A Siltstone ltgy.-gy, v. tough & compact, carbonaceous & micaceous: grades to ss in pt ltgry vfg-mg muchclay matrix carbon. & mica. & Silty Mudstone dk brngry cb & mica Extensively burrowed, brngy mudstone commonly infilling burrows Occ. thin coaly lenses & carbonised plant remains, Ss layers show current ripple laminae : pyrite nodules
70			8480-81	Ss ltgy vf-cg abund Kaol mtrx, very carbonaceous, non calc, tough & compact cut by thin veinlet of mob. coal or pyrobitumen, Ext. burrowing.
			8481-83.5	Silty Mudstone : grading to Arg Slst brn gry, burrowed, carbon. plant remains as above.
80			8483.5-87	Ss; ltgry, m-cg, s.w.s., A-r., Kaol mtrx dark col. lithic grains, Min flour. No Pet. Odour; Carbonaceous flecks & grains, carbonaceous laminae, burrowed coarse grained bands grade finer upward (2'-3"+k) - No overall grading
		-S		
		-g	8487-96	Argill Sltst : → Silty Mudstone : dk brn gry - gry - extensive burrowing, carbonaceous, micaceous carbonised plant remains as in interval 67-80
90			8496-98	Ss : ltgry, m-c.g., soft, wh kaol matrix, dark lithic grains, in part dolo cement tabular layers & irreg. zones of dolomitisation (reflecting burrowing). No Petrol. Odour. Mineral Flouresence : Carbonaceous.
		-S		

REMARKS: 2 Canned Samples : 1 Pal. & 1 Source. & P.E.

ESSO STANDARD OIL (AUSTRALIA) LTD.

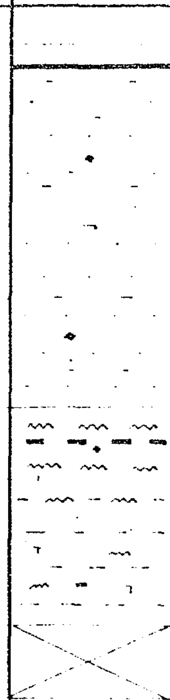
CORE DESCRIPTION

Core No. 26

WELL: SNAPPER 1

Interval Cored 9241 - 9259 ft., Cut 18 ft., Recovered 12 ft., (50 %) Fm. LATROBE

Bit Type C20, Bit Size 8 5/8 in., Desc. by D.W.W. BJB Date August 4, 1968

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows	Interval (ft.)	Descriptive Lithology
9245 50 55 9259		● ●	9241 - 9251 10'	Sandstone: brown grey, moderately hard to crumbly, medium to granule grain size with occasional pebble, mainly coarse to very coarse grained, angular to sub round, quartzose with very minor dark lithic grains, trace pyrite, white to brown stained argillaceous matrix, massive with occasional horizontal to slightly inclined bedding, occasional pyritic bands, fair porosity and permeability, good bright blue yellow fluorescence, good immediate blue yellow cut, definite staining, petroliferous odor, core bleeding gas.
			9251 - 9254 3'	Siltstone grading to silty shale: medium to dark grey to brown grey, hard, non calcareous, trace pyrite, horizontal to slightly inclined bedding, coal laminae at 9252' coal black, hard, brittle conchoidal fracture and bleeding gas.
			9254 - 9257 3'	Shale: medium to dark grey, moderately hard, silty in part, carbonaceous laminae, non calcareous, micaceous, good plant imprints, small [illegible] fractures
			9257 - 9259 2'	Lost core

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

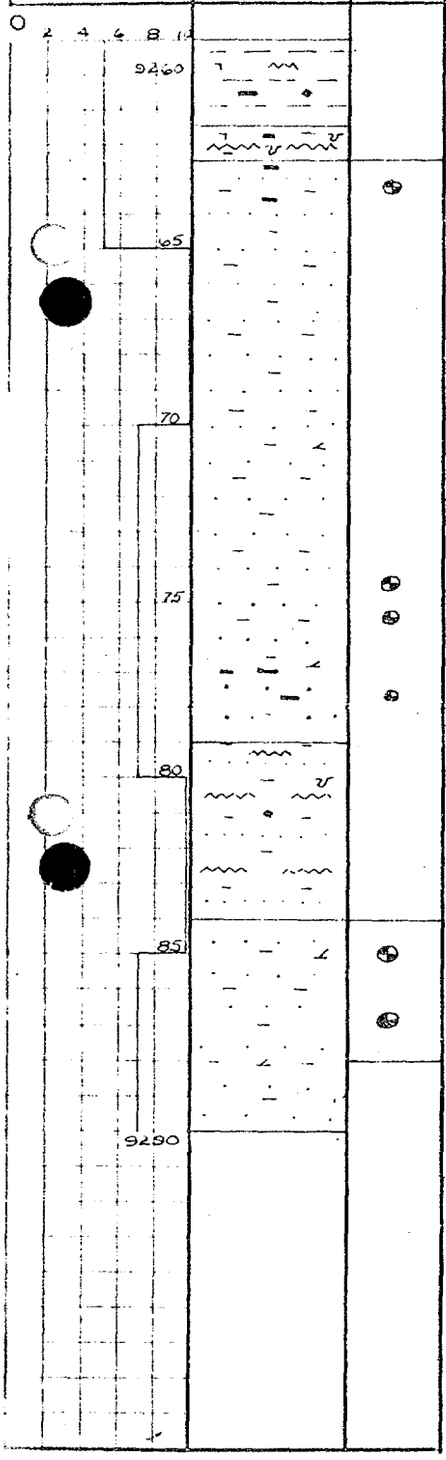
27/31

Core No. 27

WELL: SNAPPER A-1

Interval Cored 9259 - 9290 ft., Cut 31 ft., Recovered 31 ft., (100 %) Fm. LATROBE

Bit Type C20, Bit Size 8 5/16 in., Desc. by DWW BJB Date AUGUST 3, 1968



Interval (ft.)	Descriptive Lithology
9259 - 9261.5 2.5'	Shale: brown grey, hard, silty, slightly micaceous, non calcareous, coaly streaks and laminae, occassional pyrite blebs most often associated with coal, coalified plant imprints.
9261.5 - 9262.5 1'	Siltstone: dark brown grey, hard, argillaceous, grading to very fine grained sand, carbonaceous, slightly micaceous non calcareous, extensively burrowed.
9262.5 - 9279 16.5'	Sandstone: light grey with some buff, hard, v. fine to granular grained, grain size increases with depth, quartzose with occassional dark lithic grain, angular to sub round, fair to moderate sorting, very slightly dolomitic in part, abundant argillaceous matrix, thin horizontal carbonaceous laminae in top 2 feet but otherwise massive with only occassional laminae interbedded coal and plant fragments in bottom', poor porosity and permeability. 9262.5 - 9275 good pin point fluorescence with occassional laminae up to 2" thick of yellow fluorescence, good cut; 9275 - 9279 solid to patchy yellow fluorescence, good cut, staining, light petroleum odor.
9279 - 9284 5'	Interbedded siltstone and very fine grained sandstone light brown to light grey, sandstone is lighter colored, hard, argillaceous, carbonaceous laminae, horizontal bedding, pyrite blebs, occassional burrow, no show.
9284 - 9290 6'	Sandstone: light grey, firm to crumbly, medium to granular grained, quartzose with trace dark lithics, subangular to sub round, poor to fair sorting, carbonaceous, slightly dolomitic, abundant white and brown argillaceous matrix, poor porosity and permeability. 9284 - 9286 pin point fluorescence good cut; 9286 - 9288 good solid yellow fluoresc good cut, staining; 9288 - 9290 very slight pin point fluorescence, no staining, no cut.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

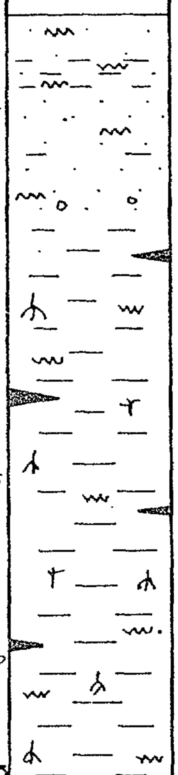
28/31

Core No. 28

WELL: SNAPPER ~~A~~ 1

Interval Cored 9882 - 9903 ft., Cut 21 ft., Recovered 21 ft., (100 %) Fm. LATROBE .

Bit Type C-8 , Bit Size 8 5/16 in., Desc. by WFT Date

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows	Interval (ft.)	Descriptive Lithology
0 9880 9885 9890 9895 9900 9903		⊕ ⊕	9882'-3½'	SANDSTONE. Qtz WACKE, white to lt gre f.-med. grained occ v.crs.-crs sa qtz., poorly sorted, abundant clay matrix, scattered lithic fragments + rare feldspar. Lens and clasts dk chocolate + grey shale. Thin, wavy, discontin laminae of shale. No φ + K. No show.
			9883½'-4½'	SHALE, + Qtz WACKE, shale is dk-med grey sl. silty in part, sl. cb., very ha
			9884½ - 9887'	SANDSTONE with some thin S laminae at the top. The SANDSTONE lt grey to brown, grading downwards from fine-med to crs-vcrs. Abunda clay matrix, scattered lithic fragments. A approx 9885' have a 3"-4" SHALE band aa Poor φ + Ks. Strong yellow + lt blue fluor, immedi ~~9888~~
			9887' - 9903'	SHALE, dk chocolate brown and grey, sl. silty in part, abundant scatte cb. remains, root mottlings + debris, Al thin laminae of coal. Hard, fissile splintery.

REMARKS:

FORM R

E20/11

Esso Standard Oil (Australia) Ltd.

29/31

CORE DESCRIPTION

Core No. 29

WELL: SNAPPER A-1

10,389' - 10,415'

Interval Cored _____ ft., Cut 26 ft., Recovered 25 ft., (96 %) Fm. LATROBE

Bit Type C-8, Bit Size 8¾" in., Desc. by WFT Date _____

Depth & Coring Rate (min/ft.)	Graphic (1"=5')	Shows	Interval (ft.)	Descriptive Lithology
0 10,395				
90		O	10389 - 95'	SANDSTONE (Qtz. WACKE) and lt SHALE.
95		O	89-90.	SANDSTONE, lt grey, f-med sa gl mod sorted, clay matrix, sl. silty, mica even textured. Minor thin lenses of coal. Thin SHALE bands dk grey, sl v. hard, evidence of cut + fill, slum and hydroplastic boudinage abundant clay clasts.
10,400			90-95	SANDSTONE and thin SHALE lt. br, crs-vcrs sa qtz with abund clay matrix, mod sorted. Minor frag clay clasts and ch. fragments dissem throughout. Shale laminations give ss a banded appearance. Banded lt. blue fluor and immediate lt. blue Brown oil staining probable.
05				
10,410			10,395 - 10,405	SANDSTONE (Qtz. WACKE) massi white lt. grey, v.f. - f. silty in part, ms mod sorted, clay matrix, mica, lithic fragments common, sparse dolomite as Generally very even textured, even inclined bedding and large scale cross beds occasional thin even para laminations of SHALE. ϕ + K v. poor
15			10,405 - 15'	SHALE, dk grey and brow massive, cleaves easily along bedding planes which expose thin ch la and impurity. Some even parall laminations visible due to colour also slumping and contorted bedd
			27 AUG 1968	V. hard

Geo. Mgn. _____ Expl. Mgn. ✓
Pet. Supt. _____ Dr. Supt. _____
Cons. Engr. _____ Contractor _____
OTHERS: _____ REMARKS: _____

30
31

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 30

WELL: SNAPPER A-1

Interval Cored 10,485-10513 ft., Cut 28 ft., Recovered 28' ft., (100%) Fm. LATROBE

Bit Type ....., Bit Size ..... in., Desc. by R.V. HICKS Date 23 Aug 1968

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
				SANDSTONE, quartzose with scattered to abundant lithics and feldspar (<10%) buff to pale brown grey, very fine to fine occ. medium to coarse, sub angular, poorly sorted, abundant clay matrix, fair yellow spotty flourescence and fair ribbon cut and light brn stain. Show occurs in top 3' with lower 2' having No show except for some show (as above) concentrated in 1/8" to 1/4" bands at base.
				SHALE very dark brown grey, hard blocky, with faint wavy carbonaceous lam
				Siltstone lt gy with wavy carbonaceous lam
				Shale as with 6" band containing coal lenses to 2' wide 1/4" high

REMARKS:

Core # 31 WELL: SNAPPER A1

Interval 10979 – 11009 ft., Cut 30 ft., Recovered 30 ft., (100 %) Fm. LATROBE (?) 31/31

Bit Type C-8, Bit Size 7 3/4" in., Desc. by A.K.S & M.Z. Date 31.8.68

Depth & Coring Rate (min./ft.)	Graphic (1" 5')	Shows	Interval (ft.)	Descriptive Lithology
0 10979 30 85 90 95 11000 05 09			10979'-85'	DOLOMITE : light grey green, massive, hard, very well cemented, weakly argillaceous. Recrystallized with elongate pale grey – white dolomite crystals in very fine grained crypto-crystalline grey-green argillaceous dolomitic matrix. Dolomite crystals 1 to 3 mms some locally to 4 mms; Random orientations. Some further recrystallization and cement along fractures and fissures. Very fine grained pyrite scattered throughout. Some very weak horizontal bedding.
		S	85'- 11000'6"	SANDSTONE : light grey, fine to medium grained, angular to rounded quartz, moderate to well sorted, hard, well compacted, massive to weakly laminated, homogeneous with little grading. Arenaceous material dominantly quartz with very minor < 1% feldspar and lithics. Quartz – grey, clear to milky. Pale yellow clay matrix. Weakly micaceous, very weakly dolomitic, carbonaceous laminae dipping inclined parallel laminae. Some small and large scale cross bedding, sub horizontal bedding. Local silty lamellae associated with cross bedding and carbonaceous laminae, and some leaf impressions. Weak to good odour, pinpoint to patchy pale blue to yellow fluorescence, moderate – good cut.
			11000'6" – 11,001'6"	Shaly SILTSTONE : dark grey, very hard, evenly laminated, carbonaceous, micaceous, homogeneous, well compacted, disseminated coaly stringers, some low angle cross bedding. Sharp to, and basal contact.
			11001'6" – 11008'	SANDSTONE : As above with minor silty shale interbedded as above. Sharp basal contact. Show as in sandstone above.
			11008' – 11009'	SHALE : dark brown grey, massive, hard, sub conchoidal fracture, carbonaceous flecks and disseminated lamellae, minor leaf impressions

REMARKS:

Note: Faults and microfaults, slickensided surfaces observed in sandstone and basal shale.

BIOSTRATIGRAPHY

BASIN GIPPSLAND BASIN BY DAVID TAYLOR

WELL NO. SNAPPER-1 DATE 20 April 1971 ELEV. +31'

Foram Zonules

	Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
A	Alternate					
B	Alternate					
C	Alternate					
D_1	Alternate					
D_2	Alternate			3452	1	
E	3474	0		3558	1	
	Alternate					
F	3726	1		3945	1	
	Alternate					
G	3950	3		4000	1	
	Alternate					
H_1	Alternate					
H_2	Alternate					
I_1	Alternate					
I_2	Alternate					
J_1	Alternate					
J_2	Alternate					
K	Alternate					
Pre K						

COMMENTS:

Notes. If highest or lowest data is a 3 or 4, then an alternate 0, 1, 2 highest or lowest data will be filled in if control is available.

If a sample cannot be interpreted to be one zonule, as apart from the other, no entry should be made.

0 SWC or Core - Complete assemblage (very high confidence).
1 SWC or Core - Almost complete assemblage (high confidence).
2 SWC or Core - Close to zonule change but diff to interpret (low confidence).
3 Cuttings - Complete assemblage (low confidence).
4 Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

Date Revised

BASIN GIPPSLAND DATE

WELL NAME SNAPPER-1 W519 ELEVATION KB + 31ft.

AGE	PALYNOLOGIC ZONES	HIGHEST DATA Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	LOWEST DATA Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
EOCENE	P. tuberculatus										
	U. N. asperus										
	M. N. asperus										
	L. N. asperus	4105	1				4337	2			
	P. asperopolus	4383	2				4586	0			
	U. M. diversus										
	M. M. diversus										
	L. M. diversus	5085	1				5305	2			
PALEOCENE	U. L. balmei	5623	1				5914	2	5788	1	
	L. L. balmei	6755	2				6755	2			
	T. longus	7696	1				7777	2			
LATE CRETACEOUS	T. lilliei	8492	1				9900	1			
	N. senectus	10497	2				12144	2			
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS											
PRE-CRETACEOUS											
	T.D.	12320									

COMMENTS: DINOFLAGELLATE ZONES:

Deflandrea heterophlycta Zone 4105(1) — 4122(1)

Wetzeliella thompsonae Zone 4586(1)

Wetzeliella homomorpha Zone 5788(1)

RATINGS:
0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: L.E.S./A.D.P. DATE June 1971; Dec. 1971.

DATA REVISED BY: A.D.P. DATE Jan. 1971.

FORM No R 315 12/72

CORE ANALYSIS

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	Sample 'cut in tetrachloroethylene
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
2	4090	4091	Sh; aren	13.7	<0.1	3.5*	2.23	2.59	32	5.1	N.D.	Fair	Nil	Nil
2	4101	4102	Sh; slty	16.2	21.1*	N.D.	2.16	2.58	19	5.5	N.D.	Strong	Nil	Nil
3	4121	4122	Slst;aren carb	14.1	18.0	.64	2.23	2.59	17	4.9	N.D.	Fair	Nil	Nil
3	4129	4130	Sh;slty carb	12.1	0.12	N.D.	2.23	2.54	45	10.9	N.D.	Strong	Nil	Nil
4	4149	4150	Clyst;carb	14.2	< 0.1	5.1*	2.26	2.64	2.9	5.2	N.D.	Fair	Nil	Nil
5	4163	4164	as above	15.1	0.55	N.D.	2.29	2.69	6.3	0.74	N.D.	Fair	Nil	Nil
7	4231	4232	sst;m.gr slty carb	16.3	0.39	5.7*	2.16	2.61	35	5.8	N.D.	Strong	Nil	Nil

Remarks: - Core 1 and 6 - No sample received

* - Fractured

General File No. ~~62/399~~ 72/2914

Well File No.

Petroleum Tec[illegible]gy Laboratory, Bureau of Mineral Resources, Ge[illegible]y and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER, 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
7	4242	4243	Sst; m.gr. slty,carb	23.0	1.2	169	2.00	2.60	16	3.0	N.D.	Strong	Nil	Nil
7	4252	4253	Sh;carb	12.3	<0.1	14.4*	2.28	2.61	35	6.0	N.D.	Strong	Nil	Nil
8	4258	4259	Sst;f.gr. slty carb	16.9	0.54	10.3	2.14	2.57	35	5.8	N.D.	Strong	Nil	Nil
8	4269	4270	Sh;slty aren.	15.3	<0.1	N.D.	2.14	2.53	23	6.9	N.D.	Very strong	Nil	Good
10	4335	4336	Sh;slty sl.carb	7.6	<0.1	*0.99	2.52	2.73	15	15.8	N.D.	Very strong	Nil	Nil
11	4347	4348	Sst;v.f.gr. slty carb	16.4	<0.1	*0.20	2.25	2.68	35	2.0	N.D.	Trace	Nil	Trace
11	4352	4353	Sh;slty carb	19.4	<0.1	*3.9	1.98	2.46	47	5.9	N.D.	Strong	Nil	Nil
12	4376	4377	Clyst;	16.4	<0.1	N.D	2.30	2.75	57	.31	N.D.	Neg.	Nil	Nil

Remarks: - core 9 - insufficient sample

* Fractured

General File No. ~~62/399~~ 72/2914

Well File No. _____

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED ~~DECEMBER 1973~~

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
12	4386	4387	clyst;v. slty	7.0	<0.1	N.D.	2.39	2.56	25	2.9	N.D.	Fair	Nil	Nil
12	4392	4393	Sst;f.gr. to m.gr.	20.2	0.27	N.D.	2.12	2.65	2.2	0.64	N.D.	Neg.	Nil	Nil
15	4450	4451	Slst;sl. carb	14.4	<0.1	N.D.	2.28	2.66	25	0.19	N.D.	Trace	Nil	Nil
15	4459	4460	Slst;arg.	17.2	<0.1	7.0*	2.21	2.67	34	2.2	N.D.	Strong	Nil	Nil
17	4502	4503	Sh;carb	14.1	2.2*	78.5*	2.25	2.62	49	5.7	N.D.	Strong	Nil	Nil
17	4508	4509	Sst;m.gr. to c.gr.	29.4	762	2,639	1.67	2.65	12	0.61	N.D.	Neg.	Nil	Nil
17	4520	4521	Sh;arch carb,slty	13.4	<0.1	226*	2.19	2.56	42	7.4	N.D.	Very strong	Nil	Nil
18	4549	4550	Sst;f.gr. to m.gr.	26.4	107	277	1.94	2.64	20	0.72	N.D.	N.D.	Nil	Nil

Remarks: - core 13 and 14 - Not received

core 16 - Insufficient sample

* Fractured

General File No. ~~627399~~ 72/2914

Well File No. _____

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Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER, 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
19	4580	4581	Sh;slty carb	19.3	<0.1	N.D.	2.25	2.78	13	Nil	N.D.	Trace	Spotted yellow	Nil
19	4587	4588	as above	19.7	<0.1	N.D.	2.33	2.92	10	1.5	N.D.	Fair	Nil	Nil
20	4609	4610	Sst;m.gr. to v.c.gr.arg	23.1	N.D.	938*	2.08	2.70	0.30	Nil	N.D.	Trace	Dull spotted yellow	Nil
20	4619	4620	Sst;f.gr. to c.gr.sly	25.8	599*	763*	2.00	2.69	3.8	Trace	N.D.	Neg	Dull spotted yellow	Nil
20	4630	4631	Sst;f.gr. to m.gr.	26.9	176	1,037	1.96	2.68	17	Nil	N.D.	Neg	Nil	Nil
21	4645	4646	Sst;f.gr. slty carb	28.3	43	187	1.92	2.69	35	Nil	N.D.	Neg	Nil	Nil
22	5889	5890	Slst;carb	9.9	0.13	N.D.	2.47	2.75	35	1.1	N.D.	Trace	Nil	Nil
22	5898	5900	Sst; f.gr. carb	21.5	3.7	123	2.10	2.67	NIL	Trace	N.D.	Trace	Nil	Nil

Remarks: - * Fractured

General File No. 62/299 72/2914

Well File No.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER, 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
22	5910	5911	Sst; v.f.gr. slty carb	18.2	0.5	1.3	2.21	2.70	6.1	Nil	N.D.	Neg	Nil	Nil
23	6748	6749	Sst; v.f.gr. sl.carb.	10.3	<0.1	<0.1	2.46	2.74	4.9	Trace	N.D.	Neg	Nil	Nil
24	7751	7752	Sh;carb,slty	7.9	<0.1	0.22*	2.40	2.61	14	1.1	N.D.	Trace	Nil	Nil
24	7760	7761	Sh;sl.carb	4.4	<0.1	N.D.	2.54	2.66	17	Trace	N.D.	Trace	Nil	Nil
24	7769	7770	Sh;slty sl.carb	5.2	<0.1	<0.1	2.45	2.59	30	2.0	N.D.	Trace	V.dull yellow trace	Trace
25	8469	8470	Sh;slty	2.7	<0.1	<0.1	2.56	2.62	43	2.7	N.D.	Trace	V.dull yellow	Trace
25	8479	8480	Slst;arg. carb.	4.8	<0.1	<0.1	2.54	2.67	13	9.7	N.D.	Trace	V.dull yellow trace	Trace
25	8489	8490	Sh;carb	2.2	<0.1	<0.1	2.52	2.58	52	8.4	N.D.	Trace	v.dull yellow trace	Trace

Remarks: -

*Fractured

General File No. ~~XXXXX~~ 72/2914
Well File No. ~~XXXXX~~

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER, 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
26	9240	9241	Sst;m.gr.to v.c.gr.arg	14.8	1.4	2.8	2.47	2.65	1.1	Trace	N.D.	Strong	Even spotted yellow	Good
26	9250	9251	Sh.slty ccol	C.8	<0.1	<0.1	2.51	2.54	71	16.9	N.D.	Fair	Nil	Good
27	9260	9261	Slst;arg aren	1.0	<0.1	<0.1	2.59	2.62	82	6.8	N.D.	Trace	Spotted dull yellow	Good
27	9269	9270	Sst;m.gr. carb	8.8	0.10	0.91	2.46	2.70	6.5	Trace	N.D.	Neg	Even spotted yellow	Nil
27	9280	9281	Sh;slty pyr.aren.	1.7	<0.1	5.43*	2.61	2.65	59	0.74	N.D.	Neg	Even dull yellow	Trace
28	9890	9891	sh.	1.7	1.3*	0.26*	2.62	2.67	31	1.1	N.D.	Neg	Nil	Good
29	10392	10393	Sh;slty	2.5	<0.1	C.40*	2.92	3.00	21	1.0	N.D.	Neg	dull spotted yellow	Trace
29	10400	10401	Sst;f.gr. to m.gr.	8.3	0.20	0.27	2.49	2.71	7.4	Nil	N.D.	Neg	dull yellow spotted	Nil

Remarks: - * Fractured

General File No. 62/399 72/2914
Well File No.

4 of 9

Petroleum Tech[illegible]ogy Laboratory, Bureau of Mineral Resources, Ge[illegible]y and Geophysics, Canberra

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CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. SNAPPER NO 1

DATE ANALYSIS COMPLETED DECEMBER, 1973

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core	SAMPLE 'CUT' IN TETRACHLOROETHYLENE
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil				
29	10410	10411	Sst;m.gr.to c.gr.carb.	11.4	1.0	2.1	2.37	2.67	2.5	0.79	N.D.	Trace	Nil	Fair
30	10485	10486	Sst;m.gr. grn.carb	11.6	0.54	1.4	2.42	2.75	1.7	3.7	N.D.	Trace	Dull yellow spotted	Good
31	10982	10983	Sst;m.gr. carb	7.8	0.10	0.11	2.50	2.71	18	Nil	N.D.	Neg	Dull yellow spotted	Nil
31	11000	11001	Sst;f.gr. to m.gr. carb	10.1	0.17	0.33	2.42	2.69	12	Nil	N.D.	Neg	Dull yellow spotted	Nil

Remarks: -

General File No. ~~52/399~~ 72/2914
Well File No.

7 8 4

Oil & Gas

Jack Dawn

RECD 22.4. KG.

Amoco Australia Petroleum Company
(Inc. in Delaware, U.S.A., with Limited Liability — Registered as a Foreign Company in Tasmania)

15 Blue Street, North Sydney
P.O. Box 126, North Sydney 2060
Phone (02) 957 4500
Telex AA23359
Facsimile (02) 922 4886

April 16, 1986

22 APR 1986

OIL and GAS DIVISION

The Director of Mines,
Department of Minerals and Energy,
East Tower, Princes Gate,
151 Flinders Street,
Melbourne. Vic. 3000

Dear Sir,

Re: Gippsland Basin Vitrinite Reflectance Measurements
MISC-AUP-141-L-310-SCB

In 1985 Amoco Australia Petroleum Company collected core and cutting samples from thirteen Gippsland Basin wells for vitrinite reflectance determinations. The following attachments are a summary of the work.

Yours faithfully,

SNAPPER - 1

S.C. Bane

S.C. Bane
Exploration Manager

SCB/lrc

Attach.

Depth (ft)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
MARLIN-1				
7070-7080	0.65	0.08	0.52-0.80	32
7497-7501	0.65	0.04	0.54-0.72	38
7780-7800	0.67	0.09	0.47-0.88	39
8230-8240	0.71	0.07	0.64-0.79	4
8455-8461	0.70	0.06	0.56-0.79	32
NANNYGAI-1				
7760-7670	0.052	0.07	0.39-0.65	33
8320-8340	0.50	0.05	0.42-0.65	32
9450-9470	0.64	0.04	0.57-0.71	35
9860-9880	0.64	0.06	0.51-0.75	31
SALMON-1				
7670-7690	0.50	0.06	0.38-0.64	35
8030-8050	0.56	0.05	0.45-0.67	37
8860	0.60	0.05	0.45-0.67	33
9250-9260	0.64	0.06	0.54-0.79	36
9856-9862	0.80	0.05	0.68-0.87	37
SNAPPER-1				
7280-7300	0.56	0.06	0.43-0.69	37
7754-7760	0.56	0.09	0.38-0.73	38
9254-9257	0.68	0.03	0.60-0.72	33
9900-9903	0.86	0.10	0.62-0.96	17
10140-10200	0.81	0.10	0.58-1.01	31
10495-10507	0.99	0.06	0.81-1.06	35

PETROGRAPHY

PETROGRAPHIC DESCRIPTION OF VOLCANICS FROM BETWEEN 10,820 AND 10,850 FEET IN ESSO'S SNAPPER A-1 WELL

Sample: Chips selected from cuttings samples between 10,820 and 10,850 feet, Esso's Snapper A-1 well, Gippsland Basin.

Submitted by: Mr. M. Zwigulis, Hematite Petroleum Pty. Ltd.; on 9th September, 1968.

Thin Section No.: 9480 (V.M.D. collection)

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1. Hand Specimen Description

The chips are dark grey in colour (N.3 of G.S.A. chart) and consist of a fine-grained crystalline igneous rock that appears to be basaltic. Identifiable crystals include clear feldspar, dark ?pyroxene, and one small phenocryst of a pale green, possibly serpentinous, mineral. They are set in a very fine-grained dark-coloured base. A narrow vein of calcite was observed in one particular chip.

2. Thin Section Description

2.1. Review

The rock is an igneous extrusive, and is inequigranular (though not noticeably porphyritic) and hypocrystalline. It is relatively fresh and is composed of fine to medium-grained crystals of olivine, plagioclase feldspar and pyroxene in a rather complex, partially glassy, base that is very fine-grained. Iron ore is quite abundant in the latter. Only the olivine can be considered as possible phenocrysts, whereas the remainder can be collectively regarded as groundmass.

The relative proportions of the constituents vary from one chip to another, a very approximate visual estimate of the range and the average being as follows:

	Range (%)	Average (%)
Olivine	0-10	5
Plagioclase	25-60	35
Pyroxene	0-15	10
'Base'	25-60	50

2.2. Details

The olivine crystals are up to and exceeding 1.4 mm. across and are subhedral to anhedral, being embayed and subdivided by cracks. The early stages of alteration to a pale green serpentine mineral is witnessed around the crystal edges and along the internal cracks.

Plagioclase feldspar with the composition of sodic labradorite occurs as tabular and, more frequently, lath-shaped subhedral to euhedral crystals up to 1.8 mm. long (though more often closer to 1 mm.). The laths are generally randomly orientated, in which case they are often interlocking, or else they may be locally aligned. Twinning is typical in the laths whereas the tabular crystals are often zoned. The feldspars are relatively fresh, but there is a tendency for them to be partially replaced by the material of the very fine-grained base.

The pyroxene is buff-coloured titaniferous augite (or 'titanaugite') present in the form of subhedral laths up to 1 mm. in length, that is, of smaller dimensions than the feldspar, and as shapeless crystals and crystal aggregates of variable size. Ophitic texture is nowhere apparent.

Inclusions of iron ore, believed to be ilmenite, are located in the crystals of augite and, to a lesser extent, of feldspar and olivine.

The so-called 'base' has a mottled cloudy brownish grey and black colour and consists of a rather complex mixture of the following: (a) uncommon brown isotropic material, believed to be glass; (b) common ill-defined needles, up to 0.1 mm. long, of plagioclase feldspar of unknown composition; (c) laths and anhedral crystals of titaniferous augite of similar size to the feldspar, but less frequent; (d) poorly-distinguishable clay mineral, possibly kaolinite; (e) small patches of flaky and microcrystalline pale green chlorite mineral; and (f) abundant iron ore, probably ilmenite, in the form of long skeletal threads, shapeless aggregates, and fine disseminated dust.

Rare patches of calcite are also present.

3. Conclusions

3.1. Rock Classification: OLIVINE BASALT

3.2. Crystallisation Summary

Crystallisation followed the normal pattern for basalts. Iron ore and olivine crystallised early, followed closely by the approximately contemporaneous development of feldspar and augite. The finer-grained feldspars and augites of the 'base' probably represent a late-stage increase in the rapidity of cooling. Glass then formed and probably devitrified to some extent, perhaps to yield the chlorite. Other than the crystal inclusions, much of the iron ore, particularly the long skeletal threads, appear to be secondary and late-stage in origin.

The relative freshness of the rock indicates that it has been largely spared from the effects of weathering and deuteric alteration.

3.3. Stratigraphic Implications

Texturally and mineralogically the olivine basalt described above fits within the context of the 'Older Volcanic Series' of Victoria (Edwards, 1938) even though it cannot be assigned to any one of Edwards' specific petrological types.

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References

Edwards, A.B., 1938. Petrology of the Tertiary Older Volcanic rocks of Victoria. Proc.Roy.Soc.Vict., 51(1): 73-98.

Barry Hocking

J.B. Hocking
Geologist
Sedimentary Basin Studies Section

13th September, 1968.

Noted. Thompson D.G.S.

PE603639

This is an enclosure indicator page.
The enclosure PE603639 is enclosed within the container PE905017 at this location in this document.

The enclosure PE603639 has the following characteristics:

ITEM_BARCODE	= PE603639
CONTAINER_BARCODE	= PE905017
NAME	= Well Completion Log
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion Log for Snapper-1
REMARKS	=
DATE_CREATED	= 9/01/69
DATE_RECEIVED	=
W_NO	= W519
WELL_NAME	= SNAPPER-1
CONTRACTOR	= WELEX, SCHLUMBERGER
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

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PE905018

This is an enclosure indicator page.
The enclosure PE905018 is enclosed within the container PE905017 at this location in this document.

The enclosure PE905018 has the following characteristics:

ITEM_BARCODE	= PE905018
CONTAINER_BARCODE	= PE905017
NAME	= Core Analysis Report
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= NUM_LOG
DESCRIPTION	= Core Analysis Report for Snapper-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W519
WELL_NAME	= SNAPPER-1
CONTRACTOR	= BAROID
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

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PE905019

This is an enclosure indicator page.
The enclosure PE905019 is enclosed within the container PE905017 at this location in this document.

The enclosure PE905019 has the following characteristics:

ITEM_BARCODE	= PE905019
CONTAINER_BARCODE	= PE905017
NAME	= Time-Depth Curve
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time-Depth Curve (interpretative) for Snapper-1
REMARKS	=
DATE_CREATED	= 21/12/71
DATE_RECEIVED	=
W_NO	= W519
WELL_NAME	= SNAPPER-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

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