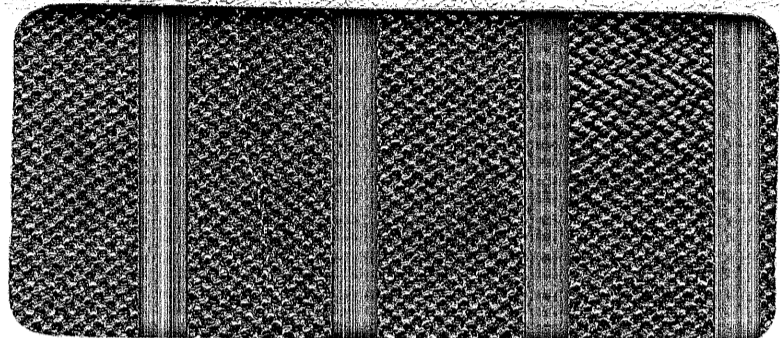


DEPT. NAT. RES & ENV  
PE902504



W840

WIRRAH-3

WCR Vol. 1

ESSO EXPLORATION AND PRODUCTION  
AUSTRALIA INC.

1 of 149

T.T.D.C. 1 SHEET

+ 2 pages. FORMINFERIAL  
DATA.

W 840

WELL COMPLETION REPORT **BASIC**

WIRRAH-3

VOLUME 1 29 NOV 1985

**OIL and GAS DIVISION**

GIPPSLAND BASIN

VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: J. ROCHE

OCTOBER. 1985

WIRRAH-3

WELL COMPLETION REPORT

VOLUME 1

CONTENTS

- 1. Well Data Record
- 2. Operations Summary
- 3. Casing Data
- 4. Cement Data
- 5. Samples, Conventional Cores, Sidewall Cores
- 6. Wireline Logs and Surveys
- 7. Summary of Formation Test Program
- 8. Summary of Production Test Program
- 9. Temperature Record

FIGURES

- 1. Locality Map
- 2. Well Progress Curve
- 3. Well Bore Schematic
- 4. Abandonment Schematic
- 5. Horner Temperature Plots

APPENDICES

- 1. Lithological Descriptions
- 2. Core Descriptions
- 3. Sidewall Core Descriptions
- 4. Velocity Survey Report

1. ESSO AUSTRALIA LTD.

COMPLETION REPORT

WELL : WIRRAH-3

LOCATION : Latitude : 38° 11' 49.40"S  
Longitude : 147° 48' 27.29"E  
X = 570 714mE  
Y = 5 771 998mN  
Map Projection:  
Geographical Location: Bass Strait  
Field: Wirrah

PERMIT : VIC/L2

ELEVATION : 21m KB

WATER DEPTH : 49m

TOTAL DEPTH : 3257mKB

PLUG BACK TYPE : Cement Plug

REASONS FOR PLUGGING BACK : Plug and Abandonment

MOVE IN : 26th November, 1983

SPUDDED : 27th November, 1983

RIG RELEASED : 27th February, 1984

OPERATOR : Esso Exploration and Production Australia Ltd.

PERMITTEE OR LICENCEE : Esso Exploration and Production Australia Ltd. and B.H.P. Petroleum Ltd.

ESSO INTEREST : 50%

OTHER INTEREST : 50%

CONTRACTOR : South Seas Drilling Company

RIG NAME : Southern Cross

EQUIPMENT TYPE : Semi-submersible

TOTAL RIG DAYS : 94

DRILLING AFE NO. : 233 014

TYPE COMPLETION : Plug and Abandonment

WELL CLASSIFICATION : Before Drilling : Outpost/Extension Test  
After Drilling : Extension Well Discovery

15011



2. SEQUENTIAL OPERATIONS

WIRRAH-3

Moor

The semi-submersible Southern Cross departed the Wrasse-1 location at 2230 hours on 25th November, 1983 and arrived at the Wirrah-3 location at 0630 hours on 26th November, 1983. The rig was towed 46.33km (25 nautical miles) by the Atlas Dampier workboat in 8 hours at an average speed of 5.79 km/hr (3.12 knots).

Anchor No. 1 was dropped by the rig with the remaining anchors run by the workboats Lady Sonia and Atlas Dampier. All the anchors were pretensioned to 200 kips.

Actual Position

Latitude: 38° 11' 49.40" S  
Longitude: 147° 49' 27.29" E  
X = 570,714m E  
Y = 5,771,998m N  
AMG Zone 55, Universal Transverse Mercator  
Projection, Australian Geodetic Datum.

The rig was located 4 meters at 224° from the called location and approximately 37 kilometers at 205° from Lakes Entrance, Victoria.

26" Hole for 20" Conductor

The drilling template was landed at the seafloor depth of 70m RKB. The 26" hole was drilled to 208m TD using seawater and displaced with slugs of high viscosity gel mud. The 18-3/4" wellhead and 20" casing were run and successfully cemented at 193m. The BOP and riser were run and the casing and collet connector pressure tested against the shear rams to 500 psi.

17-1/2" Hole for 13-3/8" Surface Casing

A 17-1/2" bit was run in the hole to 189m and a diverter drill conducted. The cement inside the 20" casing was drilled out and the hole drilled to 870m. The TD of the hole was 25m deeper than programmed since a sandy section was penetrated at the programmed TD. The hole was logged before 13-3/8" casing was run to 855m. The casing was cemented after minor problems were encountered with the wiper plug dart. The 13-3/8" seal assembly was set and tested to 200 psi/5000 psi. The BOP rams and valves were tested to 200 psi/5000 psi, while the annular preventers were tested to 200 psi/3500 psi.

12-1/4" Hole for 9-5/8" Protective Casing

The cement inside the 13-3/8" casing was drilled out to 842m where a Phase I PIT was conducted to 1500 psi. a Phase II PIT was conducted at 876m to 19.3 ppg EMW without leakoff.

The 12-1/4" hole was drilled to 2170m, at which depth two cores were cut using the 6-1/4" core barrel. Drilling continued to 2445m, where the first suite of intermediate logs and RFT's was run. The 12-1/4" hole was continued to 2960m with intermittent stops for 7 more cores and another intermediate logging run at 2776m. After logs at 2960m, 9-5/8" casing was run to 2943m and cemented in two stages using a stage collar at 2157m. The casing was set at this depth to provide protection since abnormal pressure was anticipated near 3000m. The seal assembly was successfully run and tested to 200 psi/5000 psi. The BOP stack was tested to 200 psi/3500\*psi/5000 psi.

### 8-1/2" Hole

The stage collar was drilled out and the casing tested to 3500 psi. The cement in the 9-5/8" casing was drilled out along with 6m of new hole. A Phase II PIT was conducted to 16.5 ppg EMW without leakoff. The 8-1/2" hole was drilled to the TD of 3257m, 64m short of the (revised) projected TD of 3321m. The well was terminated early on geologist's request. Increases in gas units and the results from 10-10-10's indicated abnormal pressure beginning at 3086m. Mud weight was increased from 9.6 ppg to 9.9 ppg at 3086m and reached a maximum of 12.3 ppg at 3257m. Two cores were cut in the 8-1/2" hole, although no intermediate logs were run.

While drilling was slow throughout the Intra Latrobe, the penetration rate below 3226m was extremely slow, averaging only 1m/hr. A J55 and a J22 were used to drill from 3226 to 3257m. Neither bit increased the penetration rate, nor did either show signs of wear or damage when pulled.

At total depth, the well was deviated to 10-1/4°. The hole began deviating below the Top of Latrobe and continued to gradually build down to 3257m. Neither the pendulum BHA used in the 12-1/4" hole nor the packed BHA used in the 8-1/2" hole prevented the hole from building angle. Shock subs were used in both holes.

Logs were run at total depth with cased hold RFT's at 2936.8m and 2942m. Three legs of an offset seismic survey were conducted from the positioning boat Flinders Tide before the open hole was plugged back.

Open hole cement plugs were set at 3257-3083m and 3083-2910m. After a gauge ring/junk basket run to 2910m, a 9-5/8" bridge plug was set at 2909m and pressure tested to 2200 psi (16.5 ppg EMW at casing shoe). The BOP stack was pulled and a damaged lower annular preventer element replaced. A quick-connector on the blue pod outer choke valve was also repaired.

### Production Testing

A casing scraper was run on drill pipe to the bridge plug and the mud weight reduced to 9.3 ppg. After 22.75 hours downtime due to an industrial dispute, the casing scraper was pulled and a cased hole RFT run at 2884.8m. A Model "D" packer was then set at 2850m.

Subsequent testing operations are described in "Production Testing - Operations Sequence".

### Plug and Abandonment

At the end of production testing, a cement plug was set across the highest set of perforations from 2655-2460m. The plug was tagged with 10 kips and pressure tested to 3500 psi. After a 9-5/8" gauge ring/junk basket run to 2460m, a bridge plug was set at 2458m.

Two unsuccessful attempts were made to cut the 9-5/8" casing with a Pengo explosive cutter, as both cutter assemblies had broken off of the running tool. The casing was then cut with a mechanical cutter at 306m and retrieved. A cement plug was set across the stub from 335 to 260m, with 15 bbls squeezed into the 13-3/8" x 9-5/8" annulus. After two 13-3/8" gauge ring/junk basket runs were made to 215m, where the tool hung up, a bridge plug was run and set at 220m. The plug was pressure tested to 1500 psi.

A 13-3/8" Pengo cutter was then run. As with the 9-5/8" cutters, the 13-3/8" cutter failed as well due to the cutter assembly breaking off at the running tool. The 13-3/8" casing was then mechanically cut at 174m and retrieved. A cement plug was set across the stub from 200 to 110m, with 18.5 bbls squeezed into the 20" x 13-3/8" annulus. The plug was pressure tested to 500 psi.

After retrieving the riser and BOP stack, three unsuccessful attempts were made to mechanically cut the 20" casing at 81m. The casing was eventually cut at 83m and retrieved with the wellhead, permanent guide base, and drilling template.

Pulling Anchors

The anchors were retrieved by the workboats Bass Tide, Torrens Tide and Lady Vera. Under tow by the Lady Vera, the rig departed for the Veilfin-1 location at 1715 hrs on 27th February, 1984.

17201/1-3

CASING DATA

3. WELL WIRRAH-3

CSG O.D IN.	WT. LBS/FT	GRADE	CONN.	CSG LENGTH METRES	SHOE DEPTH R.K.B.	CENTRALIZER POSITION	REMARKS
9-5/8	47	N80	BUTT	12.50		ONE ACROSS FIRST FOUR	HANGER JOINT
9-5/8	47	N80	BUTT	2076.52		COLLARS ABOVE SHOE. ONE IN	176 JOINTS
9-5/8	47	N80	BUTT	1.00		MIDDLE OF F/C JOINT. ONE ACROSS	DV COLLAR
9-5/8	47	N80	BUTT	469.90		EVERY THIRD COLLAR FOR	40 JOINTS
9-5/8	47	N80	BUTT	3.10		NEXT ONE HUNDRED AND TWENTY SIX COLLARS	PUP
9-5/8	47	N80	BUTT	130.66			11 JOINTS
9-5/8	47	N80	BUTT	3.10			PUP
9-5/8	47	N80	BUTT	141.95			12 JOINTS
9-5/8	47	N80	BUTT	12.45			FLOAT COLLAR JOINT
9-5/8	47	N80	BUTT	11.76			1 JOINT
9-5/8	47	N80	BUTT	12.29	2943.47		FLOAT SHOE JOINT

### CEMENT DATA

4. WELL WIRRAH-3

DATE	DEPTH METRES	TYPE JOB	TYPE CEMENT	AMOUNT	ADDITIVES	REMARKS
27/11/83		20" CSG LEAD	CLASS "G"	750 SX	8% PREHYDRATED GEL IN FRESHWATER	FRESHWATER SLURRY WT 13.2-13.4 PPG
	193	20" CSG TAIL	CLASS "G"	350 SX	-	SEAWATER SLURRY WT 15.8-16 PPG
30/11/83	855	13-3/8" CSG	CLASS "G"	1050 SX	-	SEAWATER SLURRY WT 15.8 PPG
6/1/84	2943	FIRST STAGE 9-5/8" CSG	CLASS "G"	855 SX	1.3% HR6L	FRESHWATER SLURRY WT 15.8 PPG
	2157	SECOND STAGE 9-5/8" CSG	CLASS "G"	990 SX	0.9% HR6L	FRESHWATER SLURRY WT 15.8 PPG
23/1/84	3257-3083	P&A OH PLUG NO. 1	CLASS "G"	320 SX	1.0% HR6L	FRESHWATER SLURRY WT 15.8 PPG
23/1/84	3083-2910	P&A OH PLUG NO. 2	CLASS "G"	238 SX	0.9% HR6L	FRESHWATER SLURRY WT 15.8 PPG
23/2/84	2655 - 2460	P&A INSIDE 9-5/8" CSG	CLASS "G"	225 SX	0.8% HR6L	FRESHWATER SLURRY WT 15.8 PPG
24/2/84	335-260	P&A ACROSS 9-5/8" STUB	CLASS "G"	219 SX		SEAWATER SLURRY WT 15.8 PPG
25/2/84	200-110	P&A ACROSS 13-3/8" STUB	CLASS "G"	504 SX		SEAWATER SLURRY WT 15.8 PPG



WELL: Wirrah-3

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

<u>INTERVAL</u>	<u>TYPE</u>
510 - 870m	3 sets of washed and air dried, and 3 sets of washed and oven dried cutting samples every 10m. 1 tin of unwashed cuttings every 15m.
870 - 3257m	3 sets of washed and air dried, and 3 sets of washed and oven dried cutting samples every 5m. 1 tin of unwashed cuttings every 15m.
2934 - 1375m	Sidewall Cores (Shot 132, recovered 121).
3242.5-2961.0m	Sidewall Cores (Shot 30, recovered 26).
2170.0-2188.0m	Conventional Core No. 1
2188.0-2205.5m	Conventional Core No. 2
2597.0-2602.1m	Conventional Core No. 3
2616.6-2635.2m	Conventional Core No. 4
2635.2-2653.0m	Conventional Core No. 5
2653.0-2671.2m	Conventional Core No. 6
2672.0-2690.5m	Conventional Core No. 7
2690.5-2709.0m	Conventional Core No. 8
2806.8-2814.0m	Conventional Core No. 9
3116.1-3117.5m	Conventional Core No. 10
3143.4-3145.4m	Conventional Core No. 11

WELL: Wirrah-3

6. WIRELINE LOGS AND SURVEYS

<u>Type and Scale</u>		<u>From</u>	<u>To</u>
<u>Suite 1</u>			
BHC GR CAL	1:200 1:500	867	193m
<u>Suite 2</u>			
DLL MSFL GR	1:200 1:500	2430	885m
LDL CNTH GR	1:200 1:500	2430	855m
RFT Pressure Record	Run 1		
HP Pressure Record	Run 1		
RFT Sample Record	Runs 2-6		
HP Sample Record	Runs 2-6		
<u>Suite 3</u>			
LDTA CNTA GR	1:200 1:500	2776	2360m
DLL MSFL GR	1:200 1:500	2776	2360m
LDTC CNTH GR	1:200 1:500	2776	2360m
HDT	1:200	2776	1350m
HP Pressure Record	Run 7		
RFT Pressure Record	Run 7		
HP Sample Record	Run 8-16		
RFT Sample Record	Run 8-16		
HP Sample Record	Run 17		
RFT Sample Record	Run 17		
HP Sample Record	Run 18-19		
RFT Sample Record	Run 18-19		
HP Sample Record	Run 20-22		
RFT Sample Record	Run 20-22		
<u>Suite 4</u>			
DLL MSFL GR	1:200 1:500	2959	2700m
LDL CNL GR	1:200 1:500	2959	2700m
BHC GR	1:200 1:500	2959	855m
HDT	1:200	2959	2700m
CST	1:200	Runs 1-3	
HP Pressure Record	Run 23-25		
RFT Pressure Record	Run 23-25		



Suite 5

DLL MSFL GR	1:200 1:500	3256	2943m
LDL CNL GR	1:200 1:500	3256	2943m
BHC GR	1:200 1:500	3256	2943m
Bond Index QL	1:200	2943	2550m
CBL VDL GR CCL	1:200	2943	2550m
CST	1:200	Run 4	
RFT Pressure Record	Runs 26-27		
HP Sample Record	Runs 28-29		
RFT Sample Record	Runs 28-29		
RFT Sample Record	Run 30		
HP Sample Record	Run 30		
HP (Sample Record)	1:200	2816m	
Perforation Record	1:200	2788	2799.5m
Perforation Record	1:200	2822	2813m
HP (Sample Record)	1:200	2820.1m	
HP (Sample Record)	1:200	2828.6m	
HP (Sample Record)	1:200	2834.5m	
Production Packer	1:200	2766m	
Production Test HP Record		2788	2779.5m
Production Record	1:200	2865m	
Perforation Record	1:200	2883	2894m
Production Test HP Record		2883.7m	
Perforation Record	1:200	2861.5	2875m
Production Packer set at 2850m			
Perforation Record	1:200	2702	2711.5m
Production Test HP Record		2672m	
Perforation Record	1:200	2686	2695.5m
Perforation Record	1:200	2666	2675m
PLT	1:200	2740	2664m
Production Test HP	1:200	2640m	
HP Sample Record		2645m	
Perforation Record	1:200	2635	2646m
Velocity Survey - Checkshots		3246	193m

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)			HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS		
				OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psla		MPaa	Psla
1	1	2395.4	Pretest										
	2	2349.1	Pretest										
	3	2339.5	Pretest										
	4	2314.3	Pretest										
	5	2282.6	Pretest										
	6	2274.2	Pretest										
	7	2243.6	Pretest										
	8	2080.8	Pretest										
	9	2052.5	Pretest										
	10	2030.8	Pretest										
	11	2028.1	Pretest										
	12	2023.7	Pretest										
	13	1810.5	Pretest										
	14	1798.6	Pretest										
	15	1780.2	Pretest										
	16	1600.7	Pretest										
	17	1600.7	Pretest										
	18	1577.8	Pretest										
	19	1535.0	Pretest										
	20	1532.2	Pretest										
	21	2278.5	Pretest										
	22	2147.3	Pretest										
	23	2144.5	Pretest										
	24	2142.0	Pretest										
2	25	2348.7	22.7										
	26	2349.2	22.7										
3	27	2349.1	22.7										
	28	2349.2	22.7	3.75		10.75		11.00					

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)					HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
			OIL	COND.	GAS	FORMATION	MUD	MPaa	Psia	MPaa	Psia	
						WATER	FILTRATE					
		Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres					
29	2349.3	10.4						-	-	27.0	3922.2	Seal Failure
30	2349.0	10.4						-	-	27.0	3921.1	Tight
31	2349.2	22.7						17.6	2548.3	27.0	3922.2	Tight, opened 6 gallon chamber
32	2142.0	10.4	0.20		0.04		9.00	20.9	3029.9	24.6	3562.4	Opened 2-3/4 gallon chamber
4	33	2022.0	22.7					19.8	2876.1	23.3	3380.0	Tight - 6 gallon chamber not building up
34	2022.2	22.7						19.8	2869.9	23.3	3080.5	Valid pretest, very slow sampling
35	2023.7	22.7	thin scum		0.03		21.5	19.8	2872.3	23.3	3380.3	Valid pretest
		10.4	4.50		0.12		3.98					
5	36	2029.1	22.7					-	-	23.4	3391.3	Pretest Seal Failure
37	2029.1	22.7						-	-	23.4	3390.6	Invalid Pretest - possible leak
38	2029.0	22.7			0.01		21.25	19.9	2879.1	23.4	3390.3	Valid Pretest and samples
		10.4			0.01		9.25					
6	39	1600.7	22.7		0.03	21.75		17.0	2472.6	18.5	2676.3	Valid Pretest and samples
		10.4			0.01	9.60						
7	40	2766.0	Pretest					-	-	31.7	4594.8	Tight
41	2767.0	Pretest						-	-	31.7	4597.7	Tight
42	2766.5	Pretest						-	-	31.7	4594.4	Seal Failure
43	2759.3	Pretest						27.2	3950.5	31.6	4581.1	Valid
44	2748.0	Pretest						27.3	3953.3	31.4	4561.2	Valid
45	2730.2	Pretest						27.0	3911.3	31.2	4531.6	Valid
46	2710.5	Pretest						26.7	3876.4	31.0	4497.6	Valid
47	2707.8	Pretest						26.7	3874.3	31.0	4493.5	Valid
48	2691.0	Pretest						26.6	3854.1	30.8	4465.0	Supercharged
49	2687.5	Pretest						26.5	3848.2	30.7	4459.5	Valid
50	2672.0	Pretest						26.5	3839.6	30.6	4432.9	Valid
51	2644.5	Pretest						26.2	3800.4	30.2	4381.4	Valid
52	2630.5	Pretest						27.1	3927.7	30.2	4365.3	Supercharged
53	2627.2	Pretest						26.2	3800.1	30.1	4361.8	Supercharged

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7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS	
				OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa		Psia
			Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres					
	54	2622.0	Pretest						26.0	3270.5	30.0	4354.1	Valid
	55	2617.0	Pretest						26.0	3769.5	30.0	4346.4	Valid
	56	2569.5	Pretest						25.4	3685.0	29.4	4267.0	Valid
	57	2536.0	Pretest						24.8	3596.8	29.0	4212.7	Valid
	58	2479.3	Pretest						24.3	3519.1	28.4	4121.0	Valid
	59	2394.5	Pretest						23.4	3398.6	27.5	3984.9	Valid
	60	2339.0	Pretest						22.9	3393.2	26.8	3893.2	Valid
8	61	2755.5	Pretest						-	-	33.7	4883.7	Tight
	62	2756.5	Pretest						-	-	33.7	4887.7	Tight
	63	2753.5	Pretest						-	-	31.6	4584.0	Seal Failure
	64	2753.5	Pretest						-	-	31.6	4583.9	Tight
	65	2748.0	22.7		scum	0.50			27.3	3953.9	31.5	4575.5	Sample
			10.4		scum	0.76		3.25	-	-	-	-	
9	66	2730.5	Pretest						27.1	3924.5	31.3	4540.1	Valid
	67	2731.0	22.7	Trace		0.02		3.75	27.0	3920.1	31.3	4538.2	Valid Pretest and Sample
			10.4	0.25		0.04		0.75	-	-	-	-	Neither chamber filled
10	68	2707.8	22.7	1.00		0.16		21.05	26.8	3879.8	31.0	4498.1	Valid Pretest and Sample
			10.4	2.00		0.23		6.00	-	-	-	-	
11	69	2687.5	22.7	4.00		0.67		15.75	26.6	3854.9	30.8	4464.4	Valid Pretest and Sample
			10.4	3.00		0.54		4.00	-	-	-	-	
12	70	2672.0	22.7			0.05		21.00	26.5	3839.7	30.6	4440.8	Valid Pretest and Sample
			3.8			0.01		3.50	-	-	-	-	
13	71	2694.5	Pretest						26.6	3859.6	30.9	4475.7	Valid
	72	2672.0	22.7	0.10		0.05		10.00	26.4	3831.7	30.6	4433.7	Valid Pretest and Sample
			10.4	0.50		0.14		8.00	-	-	-	-	
14	73	2644.5	Pretest						-	-	30.3	4395.8	Seal Failure
	74	2644.5	Pretest						-	-	30.3	4396.0	Tight
	75	2645.0	Pretest						-	-	30.3	4395.2	Tight
	76	2644.5	Pretest						26.2	3798.2	30.3	4393.6	Tight
	77	2644.7	22.7			0.01		4.50	26.2	3805.1	30.3	4393.7	Tight
			10.4			0.01		3.00	-	-	-	-	

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS		
				OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa		Psia	
				Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres					
15	78	2622.0	Pretest							-	-			
	79	2622.0	22.7		0.20	2.09		11.2		26.0	3777.6	30.0	4357.5	Seal Failure
			10.4		0.20	1.45		2.25		-	-	30.0	4356.7	Valid Pretest and Sample
16	80	2557.5	Pretest									-	-	
	81	2557.6	Pretest									29.3	4252.9	Seal Failure
	82	2557.5	Pretest									29.3	4253.9	Tight
	83	2627.2	22.7			0.07		22.30		25.2	2651.7	29.3	4254.4	Seal Failure
			10.4			0.01		9.75		-	-	30.1	4369.8	Valid Pretest and Sample
17	84	2583.3	Pretest									-	-	
	85	2583.2	Pretest									29.5	4274.6	Seal Failure
	86	2583.2	Pretest									29.5	4277.1	Seal Failure
	87	2583.3	Pretest									29.5	4271.1	Seal Failure
	88	2569.3	Pretest									29.5	4276.8	Seal Failure
	89	2569.1	Pretest									29.3	4251.0	Tight
	90	2569.5	Pretest									29.3	4253.4	Tight
	91	2569.4	Pretest									29.3	4254.1	Tight
	92	2575.0	Pretest									29.3	4253.6	Tight
	93	2573.5	Pretest									29.4	4263.7	Seal Failure
	93a	2569.0	22.7					0.10				29.4	4259.7	Seal Failure
												29.4	4254.7	Tight
18	94	2644.5	Pretest									-	-	
	95	2644.7	Pretest									30.3	4394.2	Tight
	96	2644.6	Pretest									30.3	4393.9	Tight
	97	2645.0	22.7			0.01		17.00		26.3	3808.2	30.3	4392.5	Tight
			10.4			0.01		1.50		-	-	-	-	Valid Pretest and Sample
19	98	2645.0	22.7			0.04		21.50		26.3	3807.4	30.3	4398.1	Valid Pretest and Sample
			10.4			0.01		9.78		-	-	-	-	
20	99	2753.1	22.7	Trace		0.06		22.00		27.1	3941.9	31.5	4576.0	Valid Pretest and Sample
			10.4	2.00		0.11		7.50		-	-	-	-	
21	100	2627.0	Pretest							26.1	3820.0	30.0	4369.4	Valid Pretest - Tight
	101	2627.1	22.7	Trace		0.01		18.5		26.1	3798.4	30.0	4370.5	Valid Pretest and Sample
			10.4	Trace		0.01		9.75		-	-	-	-	

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST SEAT	DEPTH (METRES)	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
			OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa	
K.B.	Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres					
22	102	2627.1	Pretest								
	103	2627.2	22.7	Trace			26.1	3796.1	30.0	4367.6	Valid - Tight
			10.4		0.02		26.1	3795.2	30.0	4367.7	Valid Pretest and Sample
23	104	2944.0	Pretest		0.01		16.25				
	105	2943.5	Pretest				9.5				
	106	2943.7	Pretest								
	107	2785.5	Pretest								
	108	2785.3	Pretest								
	109	2937.0	Pretest								
	110	2937.0	Pretest				27.41	3976.1	31.35	4540.5	Seal Failure
	111	2936.8	Pretest						31.41	4555.6	Valid
	112	2937.2	Pretest						33.39	4842.6	Seal Failure
	113	2905.5	Pretest						33.29	4827.6	Seal Failure
	114	2905.5	Pretest						33.25	4822.1	Seal Failure
	115	2905.5	Pretest						33.25	4822.0	Seal Failure
	116	2885.0	Pretest						32.82	4760.7	Tight
	117	2884.8	Pretest						32.88	4769.5	Seal Failure
	118	2869.8	Pretest						32.88	4768.9	Seal Failure
	119	2859.5	Pretest						32.58	4726.0	Seal Failure
	120	2859.4	Pretest						32.58	4726.1	Seal Failure
	121	2850.5	Pretest						32.58	4700.2	Seal Failure
	122	2834.4	Pretest						32.27	4680.8	Seal Failure
	123	2781.0	Pretest						32.28	4681.7	Seal Failure
	124	2781.5	Pretest						32.21	4671.0	Seal Failure
	125	2828.8	Pretest						32.00	4640.2	Seal Failure
	126	2829.5	Pretest						31.37	4549.5	Seal Failure
	127	2816.0	Pretest						31.37	4550.8	Tight
	128	2816.1	Pretest						31.96	4635.9	Seal Failure
	129	2804.8	Pretest						31.98	4638.9	Seal Failure
									31.84	4618.1	Seal Failure
									31.81	4614.0	Seal Failure
									31.70	4597.1	Seal Failure

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS	
			OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa		Psia
			Litres	Litres	m <sup>3</sup>	Litres	Litres					
	130	2748.0	Pretest							30.99	4494.1	Seal Failure
	131	2748.5	Pretest							31.00	4495.9	Seal Failure
	132	2730.2	Pretest							30.82	4470.6	Seal Failure
	133	2792.2	Pretest							31.58	4580.5	Seal Failure
	134	2766.0	Pretest							31.23	4529.7	Seal Failure
	135	2766.0	Pretest							31.28	4537.6	Seal Failure
	136	2767.0	Pretest							31.28	4537.2	Seal Failure
	137	2536.0	Pretest					24.79	3596.5	28.67	4158.5	Valid
24	138	2536.0	Pretest					24.85	3603.7	28.76	4171.9	Valid
	139	2536.0	Pretest					24.84	3602.2	28.76	4172.3	Valid
	140	2535.0	Pretest					24.81	3399.1	28.73	4167.8	Valid
	141	2748.0	Pretest					27.28	3956.5	31.16	4519.9	Valid
	142	2766.0	Pretest					-	-	31.34	4545.9	Tight
	143	2766.0	Pretest					-	-	31.29	4537.9	Seal Failure
	144	2766.2	Pretest					-	-	31.30	4539.5	Tight
	145	2781.0	Pretest					27.57	3998.7	31.51	4570.0	Valid
	146	2785.5	Pretest					27.43	3978.5	31.59	4581.2	Valid
	147	2792.2	Pretest					-	-	31.61	4584.4	Seal Failure
	148	2792.3	Pretest					-	-	31.58	4580.3	Seal Failure
	149	2792.4	Pretest					-	-	31.59	4581.5	Seal Failure
	150	2804.8	Pretest					-	-	31.71	4599.3	Seal Failure
	151	2804.7	Pretest					-	-	31.70	4597.2	Seal Failure
	152	2816.0	Pretest					28.47	4129.0	31.94	4632.6	Leaking
	153	2816.1	Pretest					28.45	4126.2	31.88	4624.4	Valid/Slow Leak?
	154	2828.8	Pretest					-	-	31.99	4640.5	Tight
	155	2829.5	Pretest					29.85	4329.6	32.02	4644.3	Valid/Slow Leak?
	156	2834.4	Pretest					28.98	4202.8	32.04	4646.8	Valid/Slow Leak?
	157	2850.5	Pretest					-	-	32.25	4677.4	Seal Failure
	158	2850.8	Pretest					30.32	4397.8	32.28	4682.3	Slow Leak

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST SEAT	DEPTH (METRES)	CHAMBER	RECOVERY (LITRES)					HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS	
			OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa	Psia		
	K.B.		Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres					
159	2859.5	Pretest							-	-	32.34	4690.8	Seal Failure
160	2859.3	Pretest							-	-	32.31	4685.7	Seal Failure
161	2869.8	Pretest							-	-	32.42	4701.7	Seal Failure
162	2869.0	Pretest							-	-	32.42	4701.7	Tight
163	2885.0	Pretest							-	-	32.65	4735.3	Seal Failure
164	2884.8	Pretest							-	-	32.62	4731.9	Seal Failure
165	2905.2	Pretest							-	-	32.92	4774.5	Tight
166	2937.0	Pretest							-	-	33.33	4834.6	Seal Failure
167	2936.7	Pretest							-	-	33.25	4823.0	Seal Failure
168	2944.0	Pretest							-	-	33.35	4836.7	Seal Failure
169	2944.5	Pretest							-	-	33.30	4830.1	Tight then Seal Failure
25	170	2785.5	22.7	4.5		0.7		12.40	27.50	3988.2	31.53	4573.2	Valid Sample point
			10.4	4.5		0.43		2.2					
171	2816.0	Pretest							-	-	31.88	4624.0	Seal Failure
172	2834.5	Pretest							-	-	32.10	4656.4	Seal Failure
173	2869.8	Pretest							-	-	32.59	4726.6	Seal Failure
174	2937.0	Pretest							-	-	33.43	4848.4	Seal Failure
26	175	3242.4	Pretest						-	-	46.96	6811.0	Seal Failure
176	3243.0	Pretest							-	-	46.91	6804.0	Seal Failure
177	3241.0	Pretest							-	-	46.77	6784.0	Seal Failure
178	3240.5	Pretest							-	-	46.70	6773.0	Seal Failure
179	3241.5	Pretest							-	-	46.68	6771.0	Seal Failure
180	3771.2	Pretest							-	-	45.30	6570.0	Seal Failure
181	3161.6	Pretest							-	-	45.20	6555.0	Seal Failure
182	3163.2	Pretest							-	-	45.25	6563.0	Seal Failure
183	3170.2	Pretest							-	-	45.37	6581.0	Seal Failure
184	3176.2	Pretest							-	-	46.86	6796.0	Seal Failure
27	185	3242.4	Pretest						-	-	46.76	6782.0	Seal Failure
186	3241.0	Pretest							-	-	46.71	6775.0	Seal Failure



7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - WIRRAH 3 (contd)

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS	
				OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa		Psia
				Litres	Litres	Litres	m <sup>3</sup>	Litres	Litres				
187	3241.5	Pretest						-	-	46.72	6776.0	Tight	
188	3241.8	Pretest						-	-	46.72	6776.0	Seal Failure	
189	3241.2	Pretest						-	-	46.68	6770.0	Seal Failure	
190	3242.0	Pretest						-	-	46.70	6773.0	Seal Failure	
191	3171.2	Pretest						-	-	45.30	6570.0	Seal Failure	
192	3170.2	Pretest						-	-	45.28	6568.0	Seal Failure	
193	3161.6	Pretest						-	-	45.14	6547.0	Seal Failure	
194	3176.2	Pretest						-	-	45.49	6598.0	Seal Failure	
195	3176.5	Pretest						-	-	45.50	6599.0	Seal Failure	
196	3176.5	Pretest						-	-	45.51	6599.0	Seal Failure	
197	3163.2	Pretest						-	-	45.23	6560.0	Seal Failure	
198	3172.2	Pretest						-	-	45.45	6592.0	Seal Failure	
199	3045.9	Pretest						-	-	43.48	6306.0	Seal Failure	
200	3048.5	Pretest						-	-	43.59	6322.0	Seal Failure	
201	3046.4	Pretest						-	-	43.55	6316.0	Seal Failure	
202	3041.8	Pretest						-	-	43.47	6305.0	Seal Failure	
203	3046.5	Pretest						-	-	43.53	6314.0	Seal Failure	
28	204	2936.8	45.6	0.65	1.10		34.60	33.01	4787.8	42.16	6115.3	Valid Sample	
			10.4					-	-	-	-	Preserved Sample	
29	205	2942.0	Pretest					-	-	42.17	6116.6	Seal Failure (Cased Hole)	
30	206	2884.8	45.6	0.22	0.29		40.75	-	-	31.75	4604.7	Valid Sample (Cased Hole)	
			10.4	0.05	0.02		2.13	-	-	31.64	4589.0	Chamber not filled (Cased Hole)	
31	207	2834.5	45.6	0.09	0.17		43.30	28.79	4181.0	31.14	4516.2	Valid Sample (Cased Hole)	
			3.8	Scum			3.75	27.99	4060.0	31.00	4495.9	Valid Sample (Cased Hole)	
32	208	2828.6	45.6	Scum	1.53		40.80	28.61	4154.9	31.09	4509.5	Valid Sample (Cased Hole)	
			10.4	Scum	0.10		9.20	26.40	3829.3	30.94	4487.0	Valid Sample (Cased Hole)	
33	209	2816.0	Pretest					-	4087.1	-	4482.4	Tool Plugged (Cased Hole)	
34	210	2820.1	Pretest					-	-	30.95	4487.6	Communication to hydrostatic pressure (Cased Hole)	
35	211	2645.0	Pretest					26.25	3806.6	29.05	4213.2	Tool Plugged (Cased Hole)	

8. PRODUCTION TEST SUMMARY - WIRRAH-3

Test	Date	Perforation Interval (m MUNB)	Production Fluid/ Time (hrs)	Choke Size (64th)	Flowing WHP (PSIG)	Productivity Index (STB/D/psi)	Initial Formation Pressure (psia)	Average Reservoir Pressure (psia)	Maximum BHT (OF)	Damage Ratio	Permeability Thickness (md-ft)	Permeability (md)
1	29 - 30 January 1984	2883.0-2894.0	Water and Filtrate/ 16.7	50	0	0.019 (Est)	4500.8 # 2884.8m MD	Not Measured	230.0 # 2834.1m MD	Not Measured	5.2 (Est)	0.6 (Est)
1A	31 January to 1 February 1984	2861.5-2872.5 and 2883.0-2894.0	Oil and Water/ Filtrate/ 18.7	64	0	0.017 (Est)	4500.8 # 2884.8m MD	Not Measured	234.0 # 2864.1m MD	Not Measured	6.0 (Est)	0.3 (Est)
2	4 - 5 February 1984	2813.0-2822.0	Oil/11.8	64	0	0.023 (Est)	4087.1 # 2816.0m MD	Not Measured	242 # 2814.1m MD	Not Measured	14.2 (Est)	1.2 (Est)
2A	6 - 9 February 1984	2779.5-2783.0 and 2813.0-2822.0	Oil/11.0	32	272	0.19	3976.3 # 2767.4m MD	3920.0 # 2767.4m MD	245.0 # 2767.0m MD	-2.1/ 0.77	65-104	3.4-5.5
3	12 - 15 February 1984	2665.0-2675.0	Oil/12.0	40	460	0.88	3815.8 # 2658.3m MD	3600.0 # 2658.3m MD	241.0 # 2658.0m MD	-0.8/ 0.91	954.1	45.1
3A	15 - 17 February 1984	2635.0-2695.5 and 2702.0-2711.0 and 2665.0-2675.0	Oil/12.0	40	693	2.14	3815.8 # 2658.3m MD	3670.0 # 2658.3m MD	241.0 # 2658.0m MD	-1.5/ 0.80	950.5	18.1
4	20 - 21 February 1984	2635.0-2646.0	Gas/6.0	32	516	0.729 (KSCF/D/psi)	3765.0 # 2640.0m MD	3769.0 # 2640.0m MD	226.0 # 2640.0m MD	23.5/ 4.5	57.1	17.4
4A	21 February 1984	2635.0-2646.0	Gas/Oil/ 5.4	40	504	Not Measured	3765.0 # 2640.0m MD	Not Measured	Not Measured	Not Measured	Not Measured	-

Notes:

- (1) All depths relative to KB (KB Southern Cross = 21m)
- (2) In test number 4, the well produced gas with no measurable liquid produced at surface. The produced gas was concluded to be not representative of the zone perforated and it was then decided to re-test (test number 4A) this zone by flowing the well at a higher rate through the test separator.
- (3) Test number 4A flowed slugs of oil with gas at surface. The produced gas was still considered not representative of the perforated interval and the oil produced was probably representative of the zone perforated.

22/ 9. TEMPERATURE RECORD - WIRRAH 3

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t <sub>k</sub> ) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMPERATURE (C°)	GEOHERMAL GRADIENT (C°/km)
<u>Suite 1</u>						
BHC GR CAL	867.0	39.99				
<u>Suite 2</u>						
DLL MSFL GR	2430.0	79.44	1.5	4.45	91.70	33.91
LDL CNTH GR		84.40		10.50		
<u>Suite 3</u>						
DLL MSFL GR	2776.0	91.00	2.25	6.00	109.40	36.08
LDTG CNTH GR		97.00		12.00		
LDTA CNTA GR		98.88		17.00		
HDT		101.00		21.00		
<u>Suite 4</u>						
DLL MSFL GR	2959.0	95.00	1.25	5.75	119.90	37.41
LDL CNL GR		99.00		9.50		
BHC GR		112.70		35.25		
HDT		113.00		40.25		

TEMPERATURE RECORD - WIRRAH 3 (contd)

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME ( $t_k$ ) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMPERATURE (C°)	GEOHERMAL GRADIENT (C°/km)
<u>Suite 5</u>						
DLL MSFL GR	3257.0	108.0	1.5	11.00	126.0	36.39
LDL CNL GR		103.5		6.50		
BHC GR		114.0		15.50		

15011

FIGURES

# LOCALITY MAP

## WIRRAH - 3

SCALE - 1:250,000

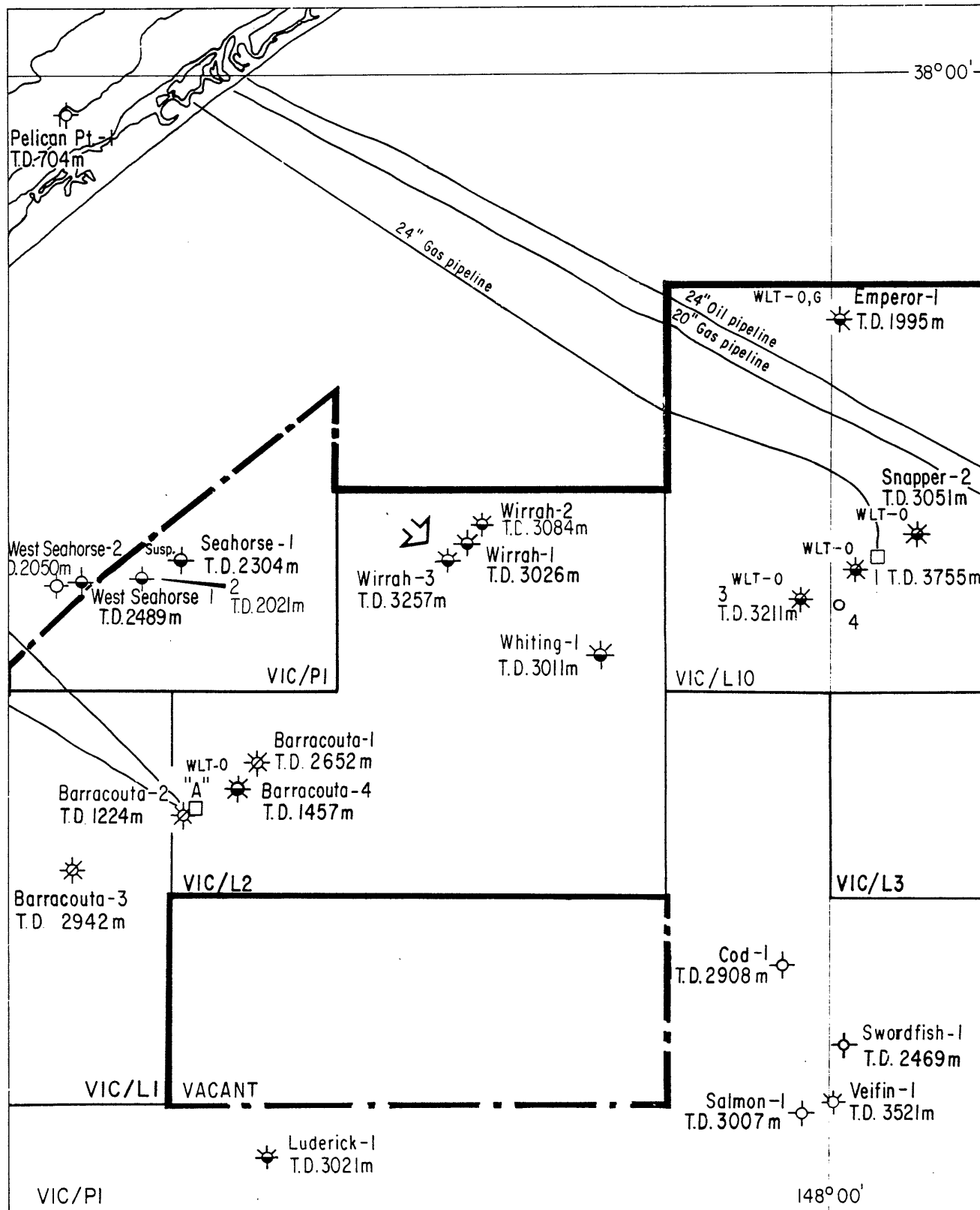


Figure 1

# WELL PROGRESS CURVE

WELL: WIRRAH-3

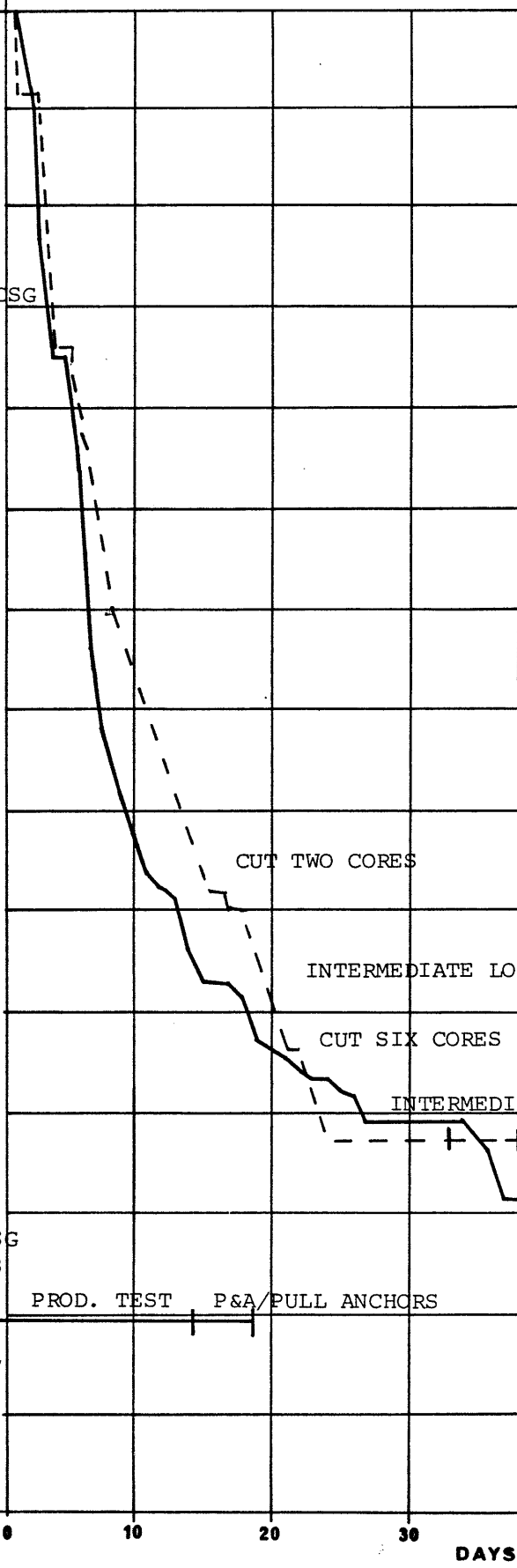
RIG: SOUTHERN CROSS

CASING SEAT

LITHOLOGY

DESIGN	ACTUAL
20" CSG	193
13-3/8" CSG	855
9-5/8" CSG	2943

MTRS RKB  
 5  
 2  
 3  
 2000  
 2500  
 3000  
 3500



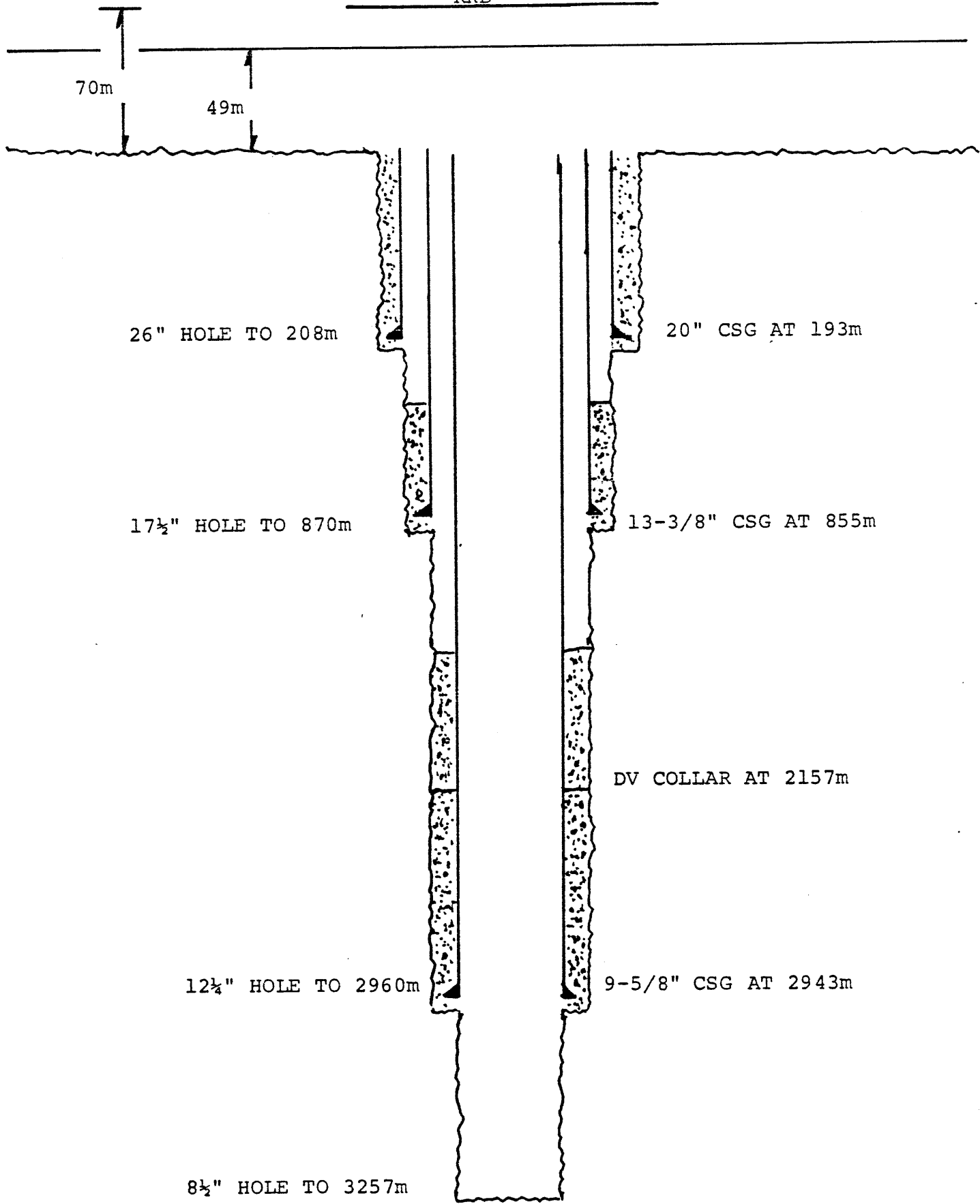
DATES		
Move	2230 HRS.	25 NOV 83
Arrive Loc.	0630 HRS.	26 NOV 83
Spud	0230 HRS.	27 NOV 83
T.D. Well	1600 HRS.	17 JAN 84
Begin Test	1015 HRS.	23 JAN 84
End Test	2000 HRS.	23 FEB 84
Depart Loc.	1715 HRS.	27 FEB 84

PROGRAM		ACTUAL
Water Depth S.S.	49m	49m
Well Depth	2821m	3257m
Total Days	33 (38 BUDGET)	93.78
Location X	570,716	570,714
Location Y	5,772,001	5,771,998
R.K.B.	21m	21m

Projected: - - - - -  
 Actual: \_\_\_\_\_

PROJECTED	ACTUAL

WIRRAH-3  
WELLBORE SCHEMATIC  
RKB



26" HOLE TO 208m

20" CSG AT 193m

17 1/2" HOLE TO 870m

13-3/8" CSG AT 855m

DV COLLAR AT 2157m

12 1/4" HOLE TO 2960m

9-5/8" CSG AT 2943m

8 1/2" HOLE TO 3257m

ALL DEPTHS - MTRS RKB



WIRRAH-3  
ABANDONMENT SCHEMATIC (TOP HOLE)

RKB

70m

49m

CUT 20" CSG @ 83m

CUT 13-3/8" CSG @ 174m

20" CSG @ 193m

13-3/8" BRIDGE PLUG @ 220m

CUT 9-5/8" CSG @ 306m

13-3/8" CSG @ 855m

PLUG NO. 5

504 SX

200-110m

TEST PLUG TO 500 PSI


PLUG NO. 4


219 SX

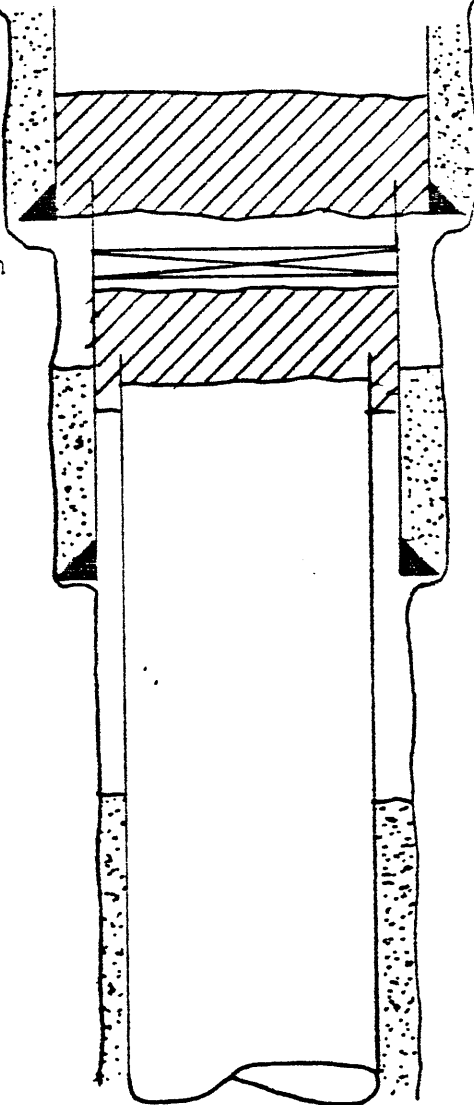
CSG: 335-260m

ANN: 375-305m

TEST TO 1500 PSI

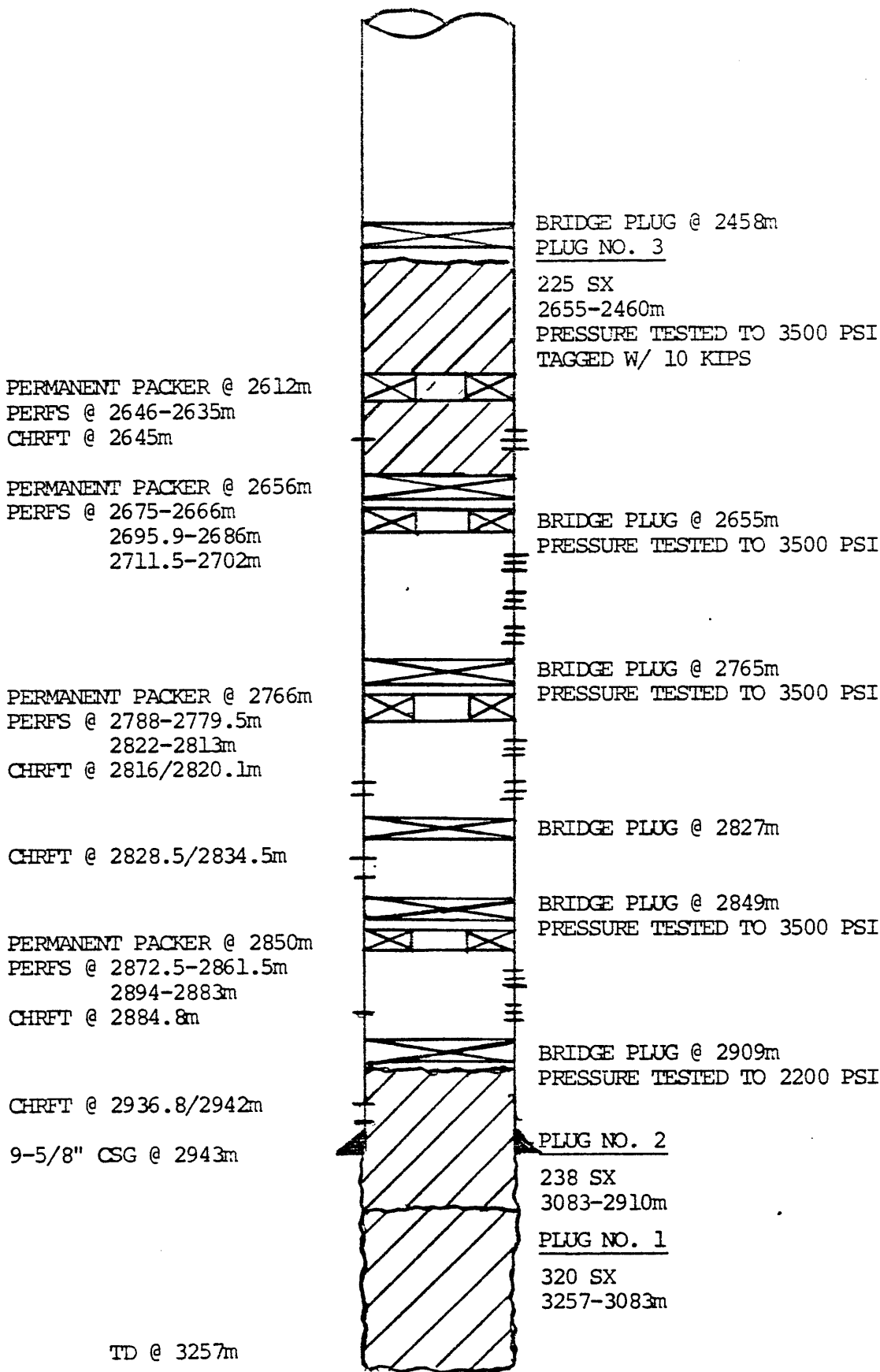
 P&A CMT

 PRIMARY CMT



WIRRAH-3

ABANDONMENT SCHEMATIC (BOTTOM HOLE)



BRIDGE PLUG @ 2458m  
PLUG NO. 3

225 SX  
2655-2460m  
PRESSURE TESTED TO 3500 PSI  
TAGGED W/ 10 KIPS

PERMANENT PACKER @ 2612m  
PERFS @ 2646-2635m  
CHRFT @ 2645m

PERMANENT PACKER @ 2656m  
PERFS @ 2675-2666m  
2695.9-2686m  
2711.5-2702m

BRIDGE PLUG @ 2655m  
PRESSURE TESTED TO 3500 PSI

PERMANENT PACKER @ 2766m  
PERFS @ 2788-2779.5m  
2822-2813m  
CHRFT @ 2816/2820.1m

BRIDGE PLUG @ 2765m  
PRESSURE TESTED TO 3500 PSI

CHRFT @ 2828.5/2834.5m

BRIDGE PLUG @ 2827m

PERMANENT PACKER @ 2850m  
PERFS @ 2872.5-2861.5m  
2894-2883m  
CHRFT @ 2884.8m

BRIDGE PLUG @ 2849m  
PRESSURE TESTED TO 3500 PSI

CHRFT @ 2936.8/2942m

BRIDGE PLUG @ 2909m  
PRESSURE TESTED TO 2200 PSI

9-5/8" CSG @ 2943m

PLUG NO. 2

238 SX  
3083-2910m

PLUG NO. 1

320 SX  
3257-3083m

TD @ 3257m

ALL DEPTHS-m RKB

29/

### WIRRAH 3

HORNER TEMPERATURE PLOT  
WIRELINE LOGGING SUITE 2

$t_k$  = circulation time 1.5 hrs

$\Delta t$  = time since circulation

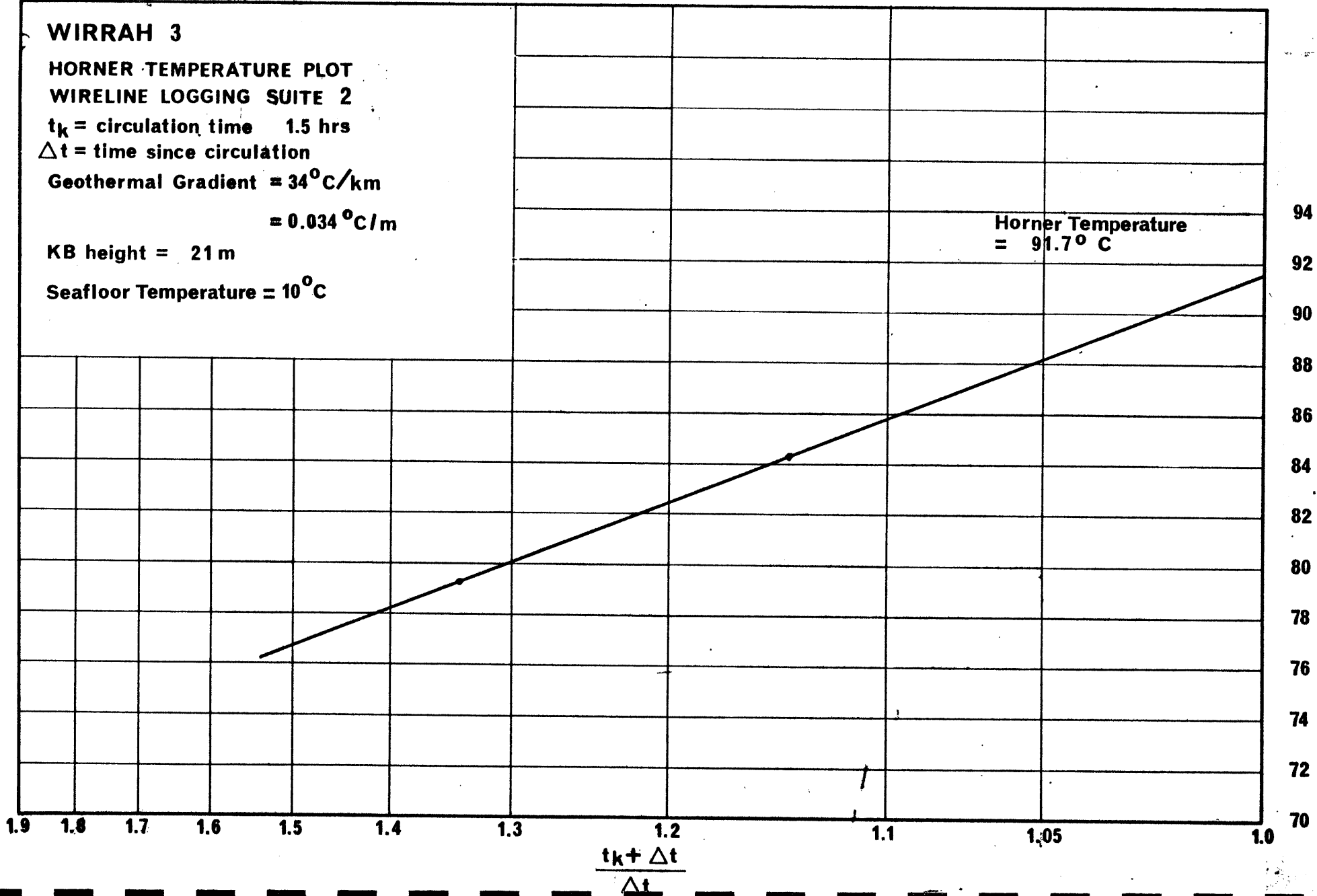
Geothermal Gradient =  $34^\circ\text{C}/\text{km}$

=  $0.034^\circ\text{C}/\text{m}$

KB height = 21 m

Seafloor Temperature =  $10^\circ\text{C}$

TEMPERATURE  $^\circ\text{C}$



301

### WIRRAH 3

HORNER TEMPERATURE PLOT  
WIRELINE LOGGING SUITE 3

$t_k$  = circulation time 2.25 hrs

$\Delta t$  = time since circulation

Geothermal Gradient =  $36^\circ\text{C}/\text{km}$

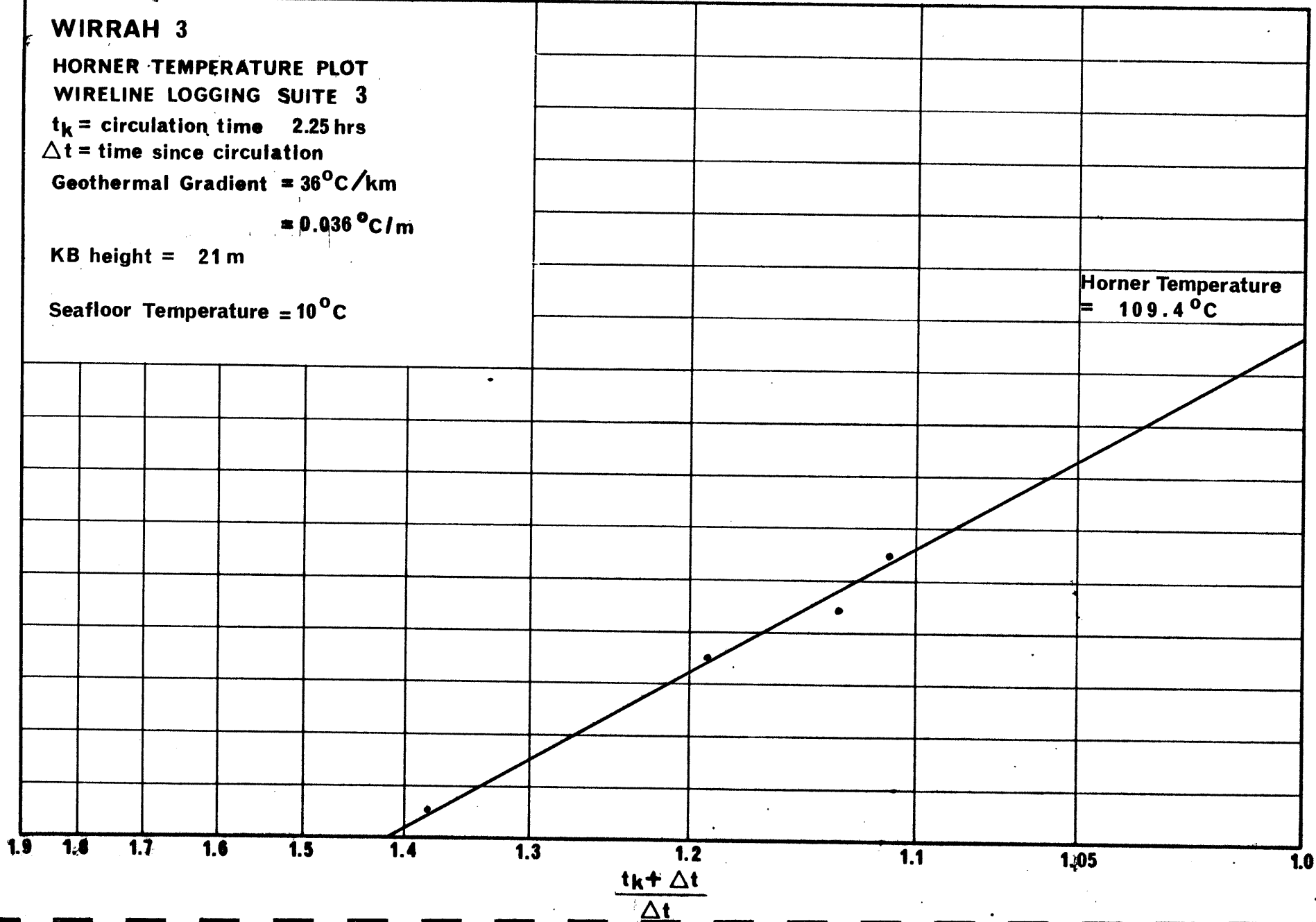
=  $0.036^\circ\text{C}/\text{m}$

KB height = 21 m

Seafloor Temperature =  $10^\circ\text{C}$

Horner Temperature  
=  $109.4^\circ\text{C}$

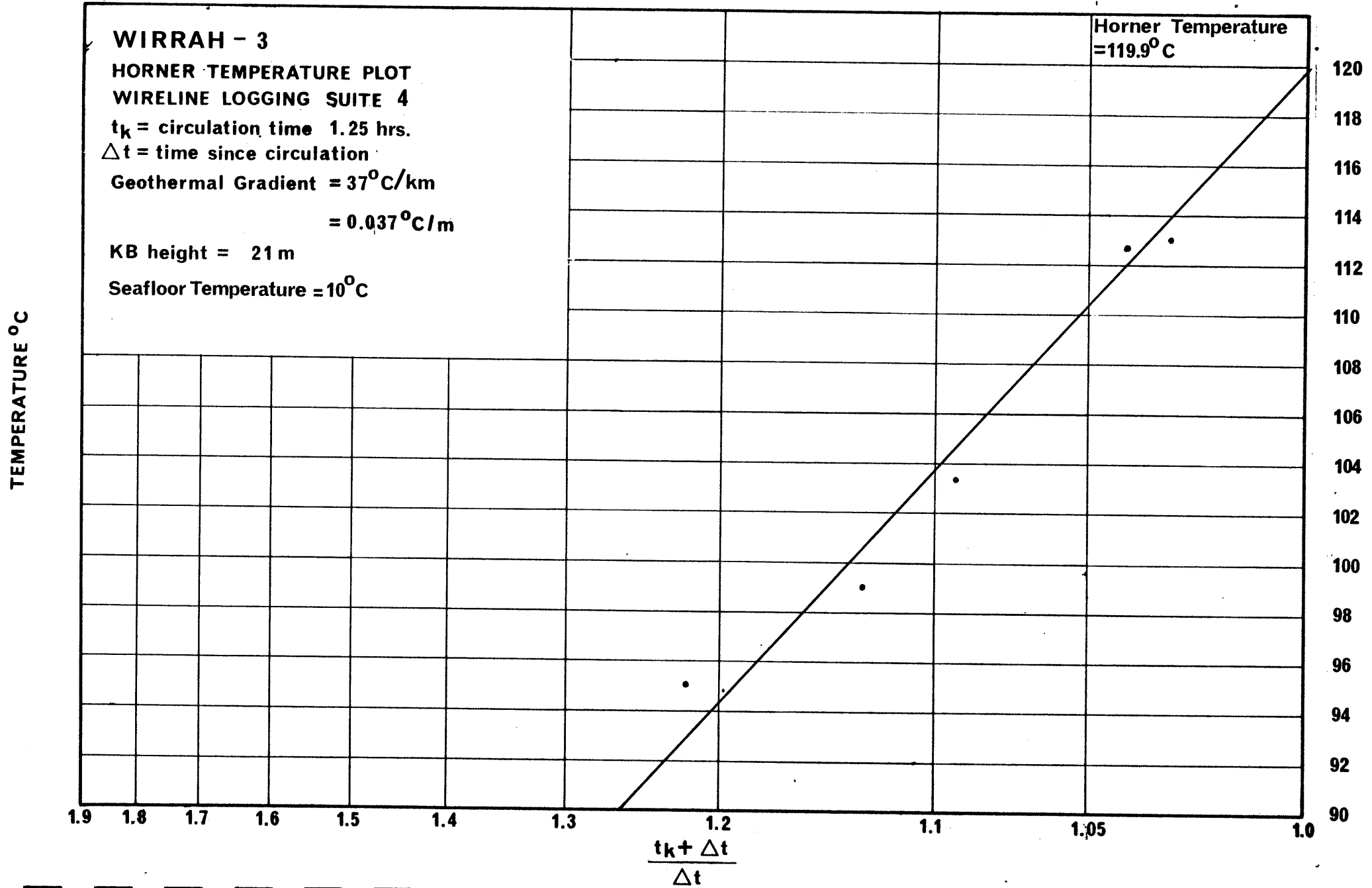
TEMPERATURE  $^\circ\text{C}$



110  
108  
106  
104  
102  
100  
98  
96  
94  
92  
90

1.9 1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.05 1.0

$\frac{t_k + \Delta t}{\Delta t}$



32/

### WIRRAH 3

HORNER TEMPERATURE PLOT  
WIRELINE LOGGING SUITE 5

$t_k$  = circulation time 1.5 hrs

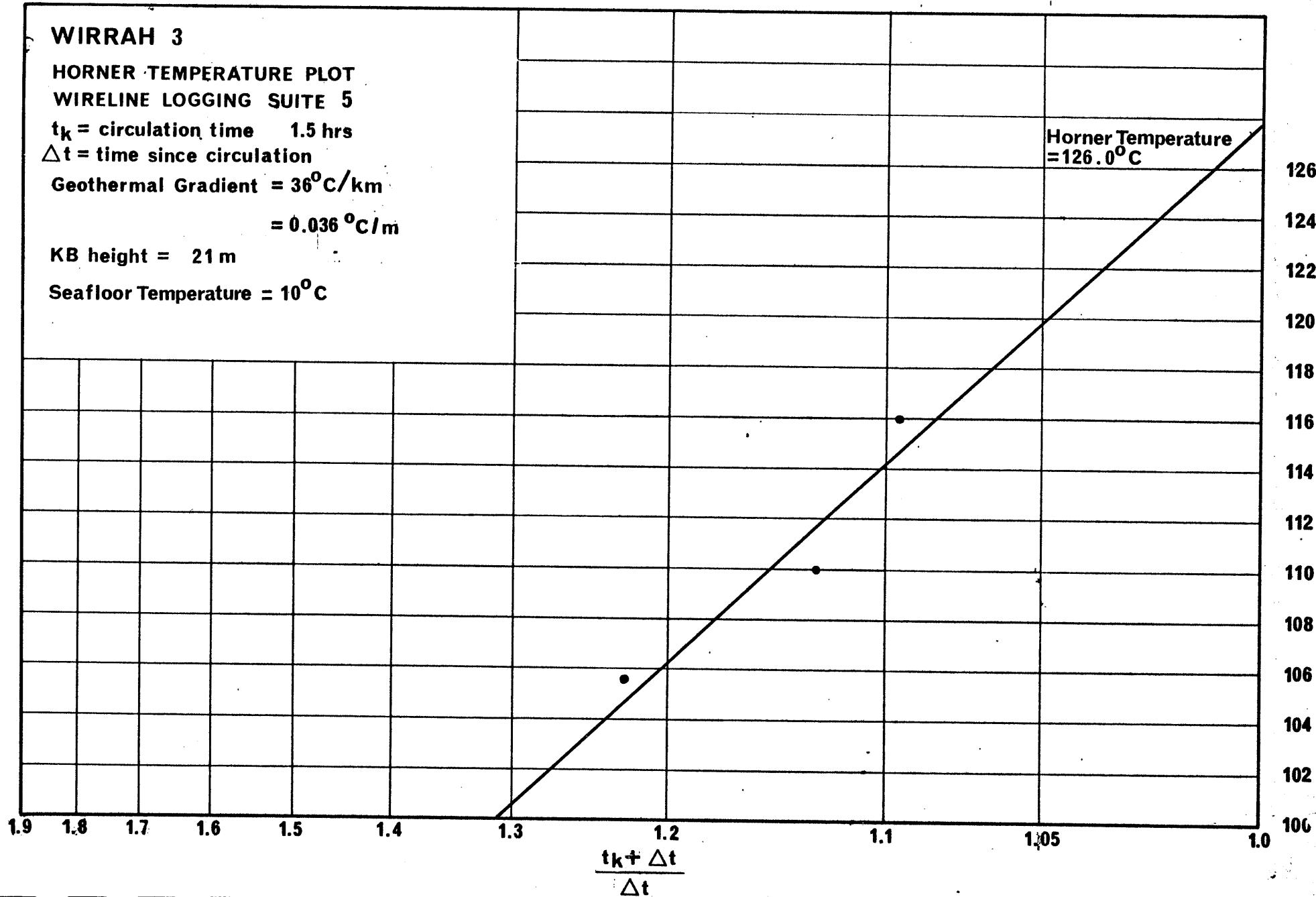
$\Delta t$  = time since circulation

Geothermal Gradient =  $36^\circ\text{C}/\text{km}$   
=  $0.036^\circ\text{C}/\text{m}$

KB height = 21 m

Seafloor Temperature =  $10^\circ\text{C}$

TEMPERATURE  $^\circ\text{C}$



1.9 1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.05 1.0

$$\frac{t_k + \Delta t}{\Delta t}$$

126  
124  
122  
120  
118  
116  
114  
112  
110  
108  
106  
104  
102  
100

APPENDIX 1

APPENDIX - 1  
LITHOLOGICAL DESCRIPTIONS



WIRRAH 3Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Descriptions</u>
200 - 210m	100	LIMESTONE: white to light grey, friable, calcarenite, abundant microfossils, gastropods, echinoids, broken shell fragments, also cement contaminated.
210 - 220m	100	LIMESTONE: as above.
220 - 230m	100	LIMESTONE: as above.
230 - 240m	100	LIMESTONE: white to light grey, calcarenite, carbonaceous specks common, abundant microfossils, loose quartz grains also common, have orange stained cement contamination.
240 - 250m	100	LIMESTONE: white to light grey, friable, carbonaceous grains, calcarenite, broken shell fragments, loose quartz grains.
250 - 260m	100	LIMESTONE: medium grey to medium light grey, firm to hard, carbonaceous specks, common glauconite, calcarenite. Trace of microfossils.
260 - 270m	100	LIMESTONE: light to medium grey, firm to hard, calcarenite, carbonaceous specks, abundant shell fragments, occasional loose quartz - coarse grained, angular.
270 - 280m	100	LIMESTONE: as above.
280 - 290m	100	LIMESTONE: light to medium grey, firm to friable, calcarenite, glauconite and carbonaceous, grains common, trace broken shell fragments, bryozoa, echinoids, forams, also loose quartz grains.
290 - 300m	100	LIMESTONE: as above, silt particles becoming prevalent.
300 - 310m	100	LIMESTONE: as above, silty.
310 - 320m	100	LIMESTONE: as above, - light to medium grey, firm to moderately hard, friable in part, calcarenite, trace carbonaceous grains, common microfossils as above; loose coarse quartz grains, silty.
320 - 330m	100	LIMESTONE: medium grey, argillaceous, soft to friable, abundant microfossils, shell fragments, calcisiltite, biosparite.
330 - 340m	100	LIMESTONE: medium grey, friable to firm, occasionally soft, common microfossils, calcisiltite.

- 2 -

340 - 350m	100	LIMESTONE: light to medium grey, calcarenite, common microfossils, firm to hard, rare shell fragments, biosparite.
350 - 360m	100	LIMESTONE: as above, slightly argillaceous in part.
360 - 370m	100	LIMESTONE: as above, slightly argillaceous, trace glauconite, biosparite.
370 - 380m	100	LIMESTONE: as above.
380 - 390m	100	LIMESTONE: as above, - medium to light grey, calcarenite, common microfossils, firm to moderately hard, slightly argillaceous, trace glauconite, biosparite.
390 - 400m	100	LIMESTONE: as above.
400 - 410m	100	LIMESTONE: as above.
410 - 420m	100	LIMESTONE: medium grey, firm to friable, biomicritic (silt grain contamination), calcisiltite, trace glauconite, common microfossils, ostracods, bryozoa.
420 - 430m	100	LIMESTONE: as above.
430 - 440m	100	LIMESTONE: as above.
440 - 450m	100	LIMESTONE: as above.
450 - 460m	100	LIMESTONE: as above, less microfossils.
460 - 470m	100	LIMESTONE: as above, becoming more friable, and sticky, ie - clay content increased.
470 - 480m	100	LIMESTONE: as above.
480 - 490m	100	LIMESTONE: as above.
490 - 500m	100	LIMESTONE: as above.
500 - 510m	100	LIMESTONE: as above.
510 - 520m	100	LIMESTONE: as above.
520 - 530m	100	LIMESTONE: as above, light to medium grey, calcarenite, occasionally calcisiltite, silty in part, biomicritic, occasional microfossils, firm to moderately hard.
530 - 540m	100	LIMESTONE: medium grey to medium dark grey, friable to firm, calcisiltite, trace octacorals, glauconite.
540 - 550m	100	LIMESTONE: as above.
550 - 560m	100	LIMESTONE: medium grey to medium dark grey, friable to sticky, calcisiltite, trace glauconite, bryozoa.

560 - 570m	100	LIMESTONE: as above.
570 - 580m	100	LIMESTONE: as above.
580 - 590m	100	LIMESTONE: as above.
590 - 600m	100	LIMESTONE: medium grey to medium dark grey, occasionally green, friable, grades to calcarenite, trace glauconite, clayey matrix, trace bryozoa, minor trace fossils.
600 - 610m	100	LIMESTONE: as above.
610 - 620m	100	LIMESTONE: as above.
620 - 630m	100	LIMESTONE: as above.
630 - 640m	100	LIMESTONE: as above, rare fossils/microfossils, firm to hard, occasionally sticky.
640 - 650m	100	LIMESTONE: as above, grades to calcarenite.
650 - 660m	100	LIMESTONE: as above.
660 - 670m	100	LIMESTONE: medium grey to dark grey, occasionally green, friable to hard, grades to calcarenite, minor trace glauconite, trace fossils.
670 - 680m	100	LIMESTONE: as above, clayey matrix.
680 - 690m	100	LIMESTONE: as above, clayey matrix.
690 - 700m	100	LIMESTONE: as above, trace dolomite, tan to buff, moderately hard.
700 - 710m	100	LIMESTONE: as above, grades to calcarenite.
710 - 720m	80	SANDSTONE: trace clear quartz grains, angular to subangular, glauconitic.
	20	LIMESTONE: as above.
720 - 730m	70	SANDSTONE: clear to opaque quartz grains, angular to subangular, unconsolidated, moderately to well cemented, very calcareous, trace fossils, no sorting.
	30	LIMESTONE: grading to calcarenite.
730 - 740m	100	LIMESTONE: grading to calcarenite, white to light grey to occasionally dark grey, friable to hard, trace glauconite, minor trace fossils.
740 - 750m	100	LIMESTONE: grading to calcarenite, as above.
750 - 760m	100	LIMESTONE: as above.
760 - 770m	100	LIMESTONE: light grey to dark grey, friable to hard, sandy matrix, grades to calcarenite, trace glauconite.

895 - 900m	100 trace	LIMESTONE: medium grey calcarenite as above, abundant argillaceous and silty matrix. FORAMS
900 - 905m	100 trace	LIMESTONE: as above. FORAMS
905 - 910m	100	LIMESTONE: as above.
910 - 915m	100 trace	LIMESTONE: calcarenite as above, could also be classified as a calcareous argillaceous siltstone. FORAMS
915 - 920m	100 trace	LIMESTONE: as above, occasional calcite veins, rarely slightly pyritic. FORAMS
920 - 925m	100 trace trace	LIMESTONE: as above. FORAMS SHELL FRAGMENTS
925 - 930m	100 trace	LIMESTONE: calcarenite as above, occasional sponge spicules. FORAMS
930 - 935m	100 trace trace	LIMESTONE: calcarenite as above; grades to light grey calcareous silty claystone in part; very soft, sticky. BRYOZOAN FRAGMENTS FORAMS
935 - 940m	100 trace trace trace	LIMESTONE: 1) common olive grey to white calcarenite, hard to very hard, crystallised texture, angular cuttings, common forams, shell fragments, glauconitic, no matrix, extremely calcareous, ie a skeletal limestone; 2) also medium grey, soft to firm cuttings, very argillaceous. Is really a calcareous siltstone/claystone. BRYOZOA FRAGMENTS FORAMS PYRITE (from limestone).
940 - 945m	100 trace trace trace	LIMESTONE: dominantly medium grey calcarenite/calcsiltite, very argillaceous, extremely calcareous, common forams, minor shell fragments. LOOSE FORAMS SHELL FRAGMENTS CLAYSTONE
945 - 950m	100 trace trace	LIMESTONE: medium brown calcsiltite, silty to granular texture, slightly sandy, as above. FORAMS SHELL FRAGMENTS
950 - 955m	100 trace	LIMESTONE: as above, minor olive grey calcarenite, cemented, non argillaceous. FORAMS

770 - 780m	100	LIMESTONE: as above.
780 - 790m	100	LIMESTONE: as above.
790 - 800m	80 20	LIMESTONE: as above. SANDSTONE: clear to translucent quartz grains, subangular to subrounded, friable to hard, unconsolidated.
800 - 810m	90 10	SANDSTONE: clear to opaque, medium grained, friable to hard, unconsolidated, trace glauconite, fossils. LIMESTONE: as above.
810 - 820m	100	SANDSTONE: opaque, fine to very fine grained, moderately sorted, subrounded to rounded, hard, poorly cemented, trace limestone, minor trace glauconite.
820 - 830m	100	SANDSTONE: as above.
830 - 840m	100	SANDSTONE: as above.
840 - 850m	80 20	LIMESTONE: medium grey to dark grey, friable to hard, grading to calcarenite, trace bryozoa, occasional ostracods, cuttings are angular to subangular, minor trace glauconite, shell fragments. SANDSTONE: as above.
850 - 860m	90 10	LIMESTONE: as above. SANDSTONE: trace white, fine to very fine grained, well cemented, predominantly opaque, medium to coarse grained, well rounded to rounded, moderately sorted, unconsolidated.
860 - 870m	100	LIMESTONE: as above.
870 - 875m		CEMENT
875 - 880m		Dominantly cement, some limestone.
880 - 885m	100 trace	LIMESTONE: light grey to medium grey and olive grey calcarenite, firm to hard, occasionally soft, fine to medium sized grains, silty to granular texture, partly crystalline texture in olive grey cuttings, abundant silty and argillaceous matrix, common forams, occasional shell fragments, minor quartz grains, rare glauconite/chlorite; very calcareous, common white to buff shell fragments in olive grey limestone with minor argillaceous matrix. SANDSTONE: loose quartz grains.
885 - 890m	100 trace trace	LIMESTONE: dominantly medium grey, calcarenite as above. SHELL FRAGMENTS FORAMS
890 - 895m	100 trace	LIMESTONE: calcarenite as above, silty and argillaceous as above. FORAMS

955 - 960m	100	LIMESTONE: dominantly whitish to olive grey calcarenite, fine to coarse grained, poorly sorted carbonate grains, well cemented, glauconitic, slightly silty.
	trace	FORAMS
960 - 965m	100	LIMESTONE: calcarenite as above, hard; minor grey calcisiltite grading to claystone in part.
	trace	FORAMS
965 - 970m	100	LIMESTONE: calcarenite as above, rarely slightly pyritic, heterogeneous texture, rare ostracods.
	trace	FORAMS
	trace	SHELL FRAGMENTS
970 - 975m	100	LIMESTONE: olive grey to grey calcarenite as above, well cemented.
	trace	LOOSE FORAMS
975 - 980m	100	LIMESTONE: as above.
	trace	FORAMS
	trace	SHELL FRAGMENTS
980 - 985m	100	LIMESTONE: as above, becoming silty.
	trace	FORAMS
	trace	SHELL FRAGMENTS
	rare	BRYOZOAN FRAGMENTS
	rare	QUARTZ GRAINS
985 - 990m	100	LIMESTONE: olive grey to medium grey, as above, becoming silty and slightly argillaceous.
	trace	LOOSE FORAMS
990 - 995m	100	LIMESTONE: dominantly calcisiltite grading to calcarenite, extremely calcareous, argillaceous, rarely glauconitic, moderately cemented, common forams.
995 - 1000m	100	LIMESTONE: calcarenite grading to calcisiltite, as above.
1000 - 1005m	100	LIMESTONE: olive grey to medium grey calcarenite/calcisiltite, firm to hard, occasionally soft, blocky to angular cuttings, fine grained, silty and argillaceous grading to calcisiltite, moderately cemented, extremely calcareous, grading to crystalline texture, slightly pyritic in part, common forams, occasional shell and bryozoan fragments. Minor very hard, very well cemented cuttings. Minor whitish, very argillaceous cuttings.
1005 - 1010m	100	LIMESTONE: as above, rare quartz grains.
	trace	LOOSE FORAMS
1010 - 1015m	100	LIMESTONE: calcarenite, whitish to olive grey and medium grey, granular to crystallised texture, slightly silty, as above.

1015 - 1020m	100	LIMESTONE: calcarenite as above, very fine to fine grained.
1020 - 1025m	100	LIMESTONE: dominantly whitish to live grey, moderately to well cemented calcarenite, less silty than previously.
	trace	LOOSE QUARTZ GRAINS
	trace	FORAMS
1025 - 1030m	100	LIMESTONE: white to light grey to olive grey, very well cemented, hard angular cuttings, calcarenite, fine grained, very few silty cuttings.
	trace	LOOSE FORAMS
	trace	QUARTZ GRAINS
1030 - 1035m	100	LIMESTONE: white to olive grey, crystallised, as above, slightly pyritic in part, very slightly glauconitic in part.
1035 - 1040m	100	LIMESTONE: as above, minor grey calcarenite/calcsiltite.
	trace	LOOSE FORAMS
	trace	GLAUCONITE
1040 - 1045m	100	LIMESTONE: as above.
	trace	FORAMS
1045 - 1050m	100	LIMESTONE: dominantly olive grey calcarenite, but becoming silty, grading to calcsiltite.
1050 - 1055m	100	LIMESTONE: as above.
	trace	FORAMS
	trace	BRYOZOAN FRAGMENTS
1055 - 1060m	100	LIMESTONE: calcarenite as above.
	trace	FORAMS
	trace	QUARTZ GRAINS
1060 - 1065m	100	LIMESTONE: olive grey, well cemented, calcarenite as above, slightly silty.
1065 - 1070m	100	LIMESTONE: as above, becoming more silty with some calcareous claystone.
	trace	FORAMS
1070 - 1075m	100	LIMESTONE: olive grey calcarenite as above, very fine to fine grained, minor white clayey cuttings.
	trace	FORAMS
1075 - 1080m	100	LIMESTONE: calcarenite as above, silty.
	trace	FORAMS
1080 - 1085m	100	LIMESTONE: very light grey to olive grey, crystallised, well cemented, very slightly glauconitic, as above.
	trace	FORAMS
1085 - 1090m	100	LIMESTONE: as above, rarely pyritic.
	trace	FORAMS
	trace	QUARTZ GRAINS

1090 - 1095m	100	LIMESTONE: calcarenite/calcisiltite - very fine to silt sized grains, recrystallised texture, very hard, angular cuttings.
	trace	FORAMS
	trace	BRYOZOAN FRAGMENTS
1095 - 1100m	100	LIMESTONE: as above.
1100 - 1105m	100	LIMESTONE: as above.
	trace	FORAMS
1105 - 1110m	100	LIMESTONE: as above, but becoming more silty.
	trace	FORAMS
1110 - 1115m	100	LIMESTONE: as above.
	trace	FORAMS
1115 - 1120m	100	LIMESTONE: calcarenite/calcisiltite as above, minor forams, rare shell and bryozoan fragments, rare echinoid spines.
	trace	LOOSE FORAMS
1120 - 1125m	100	LIMESTONE: as above.
	trace	FORAMS
1125 - 1130m	100	LIMESTONE: as above, occasionally soft and argillaceous.
	trace	FORAMS
	rare	QUARTZ GRAINS
1130 - 1135m	100	LIMESTONE: as above.
1135 - 1140m	100	LIMESTONE: as above.
1140 - 1145m	100	LIMESTONE: calcarenite/calcisiltite as above, more argillaceous.
	trace	FORAMS
1145 - 1150m	100	LIMESTONE: dominantly olive grey to medium grey calcisiltite, as above, few whole fossils visible, only fragments.
1150 - 1155m	100	LIMESTONE: common white to olive grey calcarenite as above.
	trace	FORAMS
1155 - 1160m	100	LIMESTONE: calcarenite/calcisiltite as above.
1160 - 1165m	100	LIMESTONE: as above, granular silty texture.
1165 - 1170m	100	LIMESTONE: as above.
1170 - 1175m	100	LIMESTONE: as above.
1175 - 1180m	100	LIMESTONE: calcarenite grading to calcisiltite as above, occasional echinoid spines.
	trace	LOOSE FORAMS
1180 - 1185m	100	LIMESTONE: as above.
1185 - 1190m	100	LIMESTONE: calcarenite/calcisiltite as above.
	trace	FORAMS



- 9 -

1190 - 1195m	100 trace trace	LIMESTONE: as above. FORAMS BRYOZOAN FRAGMENTS
1195 - 1200m	100	LIMESTONE: as above, occasional white clayey cuttings.
1200 - 1205m	100 trace trace	LIMESTONE: as above, dominantly calcisiltite, becoming softer, more clayey. FORAMS CLAYSTONE
1205 - 1210m	100 trace trace	LIMESTONE: calcisiltite, light grey to medium grey, granular silty texture, becoming soft and clayey, less fossiliferous, soft to firm, less heterogeneous composition. CLAYSTONE FORAMS Samples over the shakers are sticky.
1210 - 1215m	90 10	LIMESTONE: calcisiltite as above. CLAYSTONE: very light grey, very soft, sticky, dispersive, very calcareous.
1215 - 1220m	80 20 trace	LIMESTONE: grey calcisiltite as above. CLAYSTONE: calcareous as above. FORAMS
1220 - 1225m	80 20	LIMESTONE: as above. CLAYSTONE: as above.
1225 - 1230m	100 trace trace	LIMESTONE: calcisiltite as above, hard, moderately cemented, very little clay. FORAMS CLAYSTONE
1230 - 1235m	90 10	LIMESTONE: calcisiltite as above, slightly glauconitic in part. CLAYSTONE: as above.
1235 - 1240m	80 20 trace	LIMESTONE: as above. CLAYSTONE: as above. FORAMS
1240 - 1245m	80 20	LIMESTONE: as above, slightly pyritic in part. CLAYSTONE: as above.
1245 - 1250m	80 20 trace	LIMESTONE: calcisiltite as above, argillaceous, CLAYSTONE: as above. FORAMS
1250 - 1255m	80 20 trace	LIMESTONE: as above. CLAYSTONE: as above. FORAMS
1255 - 1260m	70 30	LIMESTONE: calcisiltite as above, becoming slightly softer and more clayey. CLAYSTONE: as above.
1260 - 1265m	70 30	LIMESTONE: as above. CLAYSTONE: as above.

- 10 -

1265 - 1270m	70 30 trace	LIMESTONE: calcisiltite, as above. CLAYSTONE: as above. FORAMS
1270 - 1275m	80 20	LIMESTONE: as above. CLAYSTONE: as above.
1275 - 1280m	80  20 trace	LIMESTONE: calcisiltite as above, soft to firm, argillaceous, very calcareous (could also be classified as a calcareous argillaceous siltstone). CLAYSTONE: as above. FORAMS
1280 - 1285m	90 10	LIMESTONE: as above. CLAYSTONE: as above.
1285 - 1290m	80 20	LIMESTONE: as above. CLAYSTONE: as above.
1290 - 1295m	80 20 trace	LIMESTONE: calcisiltite as above. CLAYSTONE: white to very light grey, very soft, sticky. FORAMS
1295 - 1300m	80 20	LIMESTONE: as above. CLAYSTONE: as above.
1300 - 1305m	90 10 trace	LIMESTONE: as above. CLAYSTONE: as above. FORAMS
1305 - 1310m	90 10 trace	LIMESTONE: as above. CLAYSTONE: as above, FORAMS
1310 - 1315m	90 10	LIMESTONE: calcisiltite/calcareous siltstone, as above. CLAYSTONE: as above.
1315 - 1320m	90  10	LIMESTONE: calcisiltite, light to medium grey, soft to firm, blocky to angular, very calcareous, buff, very small shell fragments, gives slightly speckled appearance, silty texture. CLAYSTONE: as above.
1320 - 1325m <sup>c</sup>	90 10 trace trace	LIMESTONE: calcisiltite, granular silty texture, slightly speckled appearance, as above. CLAYSTONE: as above. FORAMS PYRITE
1325 - 1330m	90 10	LIMESTONE: calcisiltite, as above, some grading to calcarenite. CLAYSTONE: as above.
1330 - 1335m	80 20	LIMESTONE: as above. CLAYSTONE: as above.

1335 - 1340m	80 20	LIMESTONE: as above. CLAYSTONE: as above.
1340 - 1345m	70 30 trace	LIMESTONE: calcisiltite, as above, becoming soft and clayey. CLAYSTONE: very soft, as above. FORAMS
1345 - 1350m	70 30	LIMESTONE: calcisiltite as above. CLAYSTONE: as above.
1350 - 1355m	60 40	LIMESTONE: calcisiltite/siltstone - grades to calcareous claystone; light to medium grey, soft to firm, angular to blocky, very calcareous, very argillaceous, minor forams and shell fragments. CLAYSTONE: as above.
1355 - 1360m	60 40 trace	LIMESTONE: calcisiltite/siltstone as above. CLAYSTONE: very soft, very light grey, sticky. FORAMS
1360 - 1365m	50 50	LIMESTONE: calcisiltite/siltstone as above, becoming very clayey. CLAYSTONE: as above.
1365 - 1370m	60 40 trace trace	CLAYSTONE: as above. LIMESTONE: calcisiltite/siltstone. FORAMS PYRITE
1370 - 1375m	50 50	CLAYSTONE: as above. LIMESTONE: calcisiltite/calcareous siltstone, as above, clayey.
1375 - 1380m	50 50 trace	CLAYSTONE: as above. LIMESTONE: calcisiltite/siltstone. FORAMS
1380 - 1385m	50 50	CLAYSTONE: as above. LIMESTONE: as above.
1385 - 1390m	60 40	LIMESTONE: as above, slightly firmer, less clayey. CLAYSTONE: as above.
1390 - 1395m	50 50 trace	LIMESTONE: as above. CLAYSTONE: as above. FORAMS
1395 - 1400m	60 40 trace trace	CLAYSTONE: as above. LIMESTONE: calcisiltite/siltstone, clayey, as above. GLAUCONITE FORAMS
1400 - 1405m	60 40 trace	CLAYSTONE: as above. LIMESTONE: as above, occasionally olive grey. FORAMS

- 12 -

1405 - 1410m	60 40 trace trace	CLAYSTONE: as above. LIMESTONE: as above, occasionally olive grey. FORAMS GLAUCONITE
1410 - 1415m	60 40 common	CLAYSTONE: as above. LIMESTONE: as above. GLAUCONITE
1415 - 1420m	60 40 common trace	CLAYSTONE: as above. LIMESTONE: calcisiltite/siltstone as above. GLAUCONITE PELLETS FORAMS
1420 - 1425m	100  trace trace	CLAYSTONE: light to medium grey as above, grades to silty calcareous claystone described previously as calcisiltite/siltstone. GLAUCONITE FORAMS
1425 - 1430m	100  trace trace	CLAYSTONE: very calcareous as above, glauconitic. GLAUCONITE FORAMS
1430 - 1435m	100  trace trace	CLAYSTONE: as above, grading to calcareous argillaceous siltstone, minor white cuttings. GLAUCONITE FORAMS
1435 - 1440m	100  trace trace	CLAYSTONE: as above, common white to very light green cuttings, silty cuttings are glauconitic, contain shell fragments. LOOSE GLAUCONITE FORAMS
1440 - 1445m	100 common common	CLAYSTONE: as above, common silty cuttings. GLAUCONITE FORAMS
1445 - 1450m	100 common common	CLAYSTONE: as above. GLAUCONITE FORAMS
1450 - 1455m	100  trace trace	CLAYSTONE: buff to very light grey to very light green grey, as above, silty cuttings are medium grey. GLAUCONITE FORAMS
1455 - 1460m	100  trace trace	CLAYSTONE: as above, commonly silty, glauconitic. GLAUCONITE FORAMS
1460 - 1465m	100  trace trace	CLAYSTONE: as above, slightly pyritic in part, silty, still very calcareous. GLAUCONITE FORAMS

1465 - 1470m	100	CLAYSTONE: very light grey to light olive green, light green, as above, silty medium grey cuttings, angular.
	trace	GLAUCONITE
	trace	FORAMS
1470 - 1475m	100	CLAYSTONE: as above.
	trace	GLAUCONITE
	trace	FORAMS
1475 - 1480m	100	CLAYSTONE: slightly glauconitic, slightly multicoloured, as above.
	trace	GLAUCONITE
	trace	FORAMS
1480 - 1485m	100	CLAYSTONE: as above, silty.
	trace	GLAUCONITE PELLETS
	trace	FORAMS
1485 - 1490m	100	CLAYSTONE: as above.
	common	GLAUCONITE
1490 - 1495m	100	CLAYSTONE: as above, but firmer, more angular, silty cuttings, becoming subfissile.
	common	GLAUCONITE
1495 - 1500m	100	CLAYSTONE: silty, splintery cuttings, brownish grey to greenish grey, firm to hard, brown grey cuttings grade to brown siltstone - hard, glauconitic, slightly pyritic, argillaceous.
	common	GLAUCONITE
1500 - 1505m	100	CLAYSTONE/SILTSTONE: brown grey, green grey, grey, silty claystone and siltstone as above.
	abundant	GLAUCONITE
	common	PYRITE
	trace	LOOSE QUARTZ GRAINS
1505 - 1510m	100	CLAYSTONE/SILTSTONE: as above.
	common	GLAUCONITE
	common	PYRITE
	common	QUARTZ GRAINS
1510 - 1515m	60	SANDSTONE: loose transparent to translucent quartz grains, medium to very coarse, occasionally granule, dominantly coarse grained; subangular to well rounded, dominantly subrounded; poorly sorted, minor pyrite on some grains indicating pyrite cement, inferred excellent porosity. No fluorescence or cut.
	40	CLAYSTONE/SILTSTONE: as above.
	common	PYRITE
	common	GLAUCONITE
1515 - 1520m	80	SANDSTONE: loose quartz, medium to very coarse grained, dominantly coarse, as above. No shows.
	20	CLAYSTONE/SILTSTONE: as above.
	trace	GLAUCONITE
	trace	PYRITE

1520 - 1525m	50	SANDSTONE: loose quartz grains as above. No shows.
	30	CLAYSTONE/SILTSTONE: as above.
	10	COAL: black, hard, angular, dull earthy texture. One chip gave instant blooming cream cut.
	10	SILTSTONE: brown to brown grey, hard, angular, argillaceous, slightly carbonaceous.
1525 - 1530m	100	SANDSTONE: loose quartz grains, clear to milky, medium to granule, dominantly coarse grained, subangular to well rounded, dominantly subrounded, moderately sorted, rounding improves with increasing size. Trace of spotty bright cream to blue white fluorescence with slow diffuse weak cream cut (possibly contaminated chlorothene).
	trace	GLAUCONITE
	trace	SILTSTONE
	trace	PYRITE
1530 - 1535m	90	SANDSTONE: as above, 5% fluorescence as above, no apparent cut - possible mineral fluorescence.
	10	CLAYSTONE/SILTSTONE: as above, cavings.
	trace	COAL
1535 - 1540m	90	SANDSTONE: as above, but coarser, dominantly very coarse. 5% fluorescence as above, no cut - probably mineral fluorescence. Some very coarse grains are very well cemented quartzose aggregates which have been rounded - possible dolomite cement.
	10	CLAYSTONE: as above, cavings.
	trace	SILTSTONE
	trace	PYRITE
1540 - 1545m	80	SANDSTONE: as above, trace of mineral fluorescence.
	20	CLAYSTONE/SILTSTONE: light grey to light green grey, firm to hard, angular, very calcareous, argillaceous - probably cavings.
	trace	PYRITE
1545 - 1550m	90	SANDSTONE: loose quartz grains as above, dominantly coarse, dominantly subangular. Trace of mineral fluorescence from extremely well cemented aggregate grains.
	10	CLAYSTONE/SILTSTONE: as above.
1550 - 1555m	70	SANDSTONE: as above.
	30	SILTSTONE: light grey to green grey as above, argillaceous grading to shale, firm to hard, angular splintery to blocky cuttings, calcareous, homogeneous texture, slightly glauconitic in part.
	trace	SILTSTONE: brown, cavings.

1555 - 1560m	70	SANDSTONE: as above, dominantly coarse, dominantly subangular, no shows.
	30	SILTSTONE: grey as above; grading to shale, calcareous.
	trace	GLAUCONITE
	trace	PYRITE
1560 - 1565m	60	SANDSTONE: as above, trace of cream mineral fluorescence from aggregates as above.
	40	SILTSTONE/SHALE: as above.
	common	GLAUCONITE
	trace	PYRITE
1565 - 1570m	40	SANDSTONE: as above, trace of mineral fluorescence.
	60	SILTSTONE/SHALE: as above, light grey to brown grey.
	common	GLAUCONITE PELLETS
	trace	PYRITE
1570 - 1575m	80	SANDSTONE: as above, but slightly finer grained, dominantly clear quartz, medium to granule, dominantly coarse, poorly to moderately sorted, occasional granules are very well cemented aggregates, common orange to brown staining on grains, no shows. Dominantly subangular to subrounded.
	20	SILTSTONE: as above, grading to shale.
	trace	GLAUCONITE
	trace	PYRITE
1575 - 1580m	90	SANDSTONE: as above, including staining - possibly dead oil? No shows.
	10	SILTSTONE: as above.
	trace	GLAUCONITE
	trace	PYRITE
1580 - 1585m	70	SANDSTONE: as above, trace of mineral fluorescence. One chip of silty sandstone aggregate with orange brown veining gave bright gold fluorescence with instant streaming to blooming milky white cut.
	30	SILTSTONE/SHALE: as above.
	trace	GLAUCONITE
	trace	PYRITE
1585 - 1590m	80	SANDSTONE: as above, trace of mineral fluorescence.
	20	SILTSTONE/SHALE: as above.
	trace	GLAUCONITE
	trace	PYRITE
1590 - 1598m (Bottoms Up)	90	SILTSTONE: 1) light grey, firm, platy to splintery, calcareous, grading to shale as above; 2) brown to very grey, blocky to rounded, soft, argillaceous, glauconitic, calcareous, slightly pyritic in part.
	10	SANDSTONE: as above.
	trace	GLAUCONITE
	trace	PYRITE

1598 - 1600m	70	SHALE: silty, light grey, as above.
	20	SILTSTONE: brown to brown grey, glauconitic as above.
	10 common trace	SANDSTONE: as above, GLAUCONITE PYRITE
1600 - 1605m	60	SANDSTONE: loose clear quartz grains, medium to very coarse grained, dominantly coarse grained, subangular to rounded, dominantly subrounded, moderately sorted, inferred very good porosity, no shows.
	20	SHALE: grey, silty, as above.
	20	COAL: black, hard, angular, conchoidal fracture.
	trace	GLAUCONITE
	trace	SILTSTONE
1605 - 1610m	50	SANDSTONE: as above, no shows.
	30	COAL: as above, instant cream streaming cut from several chips.
	20	SHALE: as above.
	trace	GLAUCONITE
	trace trace trace	SILTSTONE PYRITE
1610 - 1615m	70	COAL: as above.
	10	SANDSTONE: as above.
	10	SHALE: as above, cavings?
	10	SILTSTONE: brown, carbonaceous.
	trace	GLAUCONITE - cavings
1615 - 1620m	40	SANDSTONE: loose quartz, medium to very coarse, dominantly coarse, dominantly subangular to subrounded, moderately sorted. No shows.
	40	COAL: as above.
	10	SILTSTONE: brown, slightly speckled colour, quartzose, argillaceous, carbonaceous specks and flecks, firm, rounded cuttings, grades to carbonaceous shale.
	10	SHALE: grey, calcareous - cavings.
	1620 - 1625m	80
10		COAL: as above.
10		SILTSTONE: as above.
1625 - 1630m		100
	trace	COAL
	trace	SILTSTONE
	trace	SHALE



1630 - 1635m	90	SANDSTONE: as above, minor medium to coarse grained aggregates, very well cemented, siliceous and dolomitic cement, spotty cream mineral fluorescence, very slightly calcareous.
	10	SILTSTONE: as above.
	trace	COAL
	trace	SHALE
1635 - 1640m	90	SANDSTONE: as above, common very well cemented aggregates as above, with mineral fluorescence, occasional pyrite cement.
	10	COAL: as above.
	trace	SILTSTONE
	trace	SHALE (cavings).
1640 - 1645m	100	SANDSTONE: loose grains and aggregates as above, common patchy cream mineral fluorescence.
	trace	COAL
	trace	SILTSTONE
	trace	SHALE
1645 - 1650m	60	SANDSTONE: as above, minor aggregates.
	40	COAL: as above.
1650 - 1655m	90	SANDSTONE: as above, no aggregates, loose grains; no shows.
	10	COAL: as above.
	trace	SILTSTONE
1655 - 1660m	70	SANDSTONE: loose grains as above, common milky white grains, very coarse grains are well rounded, no shows.
	20	COAL: as above.
	10	SILTSTONE: brown carbonaceous as above.
	trace	PYRITE
1660 - 1665m	30	SILTSTONE: light brown to dark brown, laminated, soft to firm, blocky to rounded, quartzose, argillaceous, carbonaceous to microcarbonaceous, micromicaceous, grades to very fine grained sandstone in part.
	60	SANDSTONE: fine to very coarse as above, subangular to well rounded, dominantly subrounded, moderately sorted, no shows.
	10	COAL: as above.
	trace	PYRITE
1665 - 1670m	80	SANDSTONE: dominantly quartzose aggregates, some loose grains, medium to very coarse, aggregates are very hard, very well cemented, siliceous and dolomitic cement, angular broken aggregates, little or no visible porosity, spotty cream mineral fluorescence.
	10	SILTSTONE: as above.
	10	COAL: as above.
	common	CAVINGS: shale, glauconite, siltstone.
1670 - 1675m	100	SANDSTONE: as above, common mineral fluorescence from aggregates.
	trace	SILTSTONE

- 18 -

1675 - 1680m	60 40	SANDSTONE: as above. COAL: black, hard, angular, vitreous.
1680 - 1685m	70 30	COAL: as above. SANDSTONE: as above.
1685 - 1690m	90 10	COAL: as above. SANDSTONE: as above.
1690 - 1695m	80 20 trace	COAL: as above. SANDSTONE: as above, no shows. SILTSTONE
1695 - 1700m	50 40 10	COAL: as above. SANDSTONE: as above. SILTSTONE: dark brown, carbonaceous.
1700 - 1705m	40  40  20 common	SILTSTONE: dark brown, slightly speckled, soft to firm, argillaceous, grading to shale, carbonaceous specks. SANDSTONE: 1) 10% loose grains and minor aggregates; 2) 30% light to dark brown grey aggregates, hard, very well cemented, quartzose, dominantly fine to medium grained, occasionally coarse; subangular, moderately sorted, silty matrix, slightly microcarbonaceous, moderately calcareous, cream yellow mineral fluorescence - dolomitic and siliceous cement. No shows. COAL: as above, CAVINGS
1705 - 1710m	40 40 20	SILTSTONE: carbonaceous, shaley as above. COAL: as above. SANDSTONE: clear quartz as above; dirty aggregates as above.
1710 - 1715m	60  30 10	SANDSTONE: dominantly loose clear quartz grains, rarely fine (in tray) to very coarse grained, dominantly coarse, subangular to rounded, dominantly subrounded, poorly to moderately sorted, inferred very good porosity. No shows. SILTSTONE: as above. COAL: as above.
1715 - 1720m	40 30 30	SANDSTONE: loose milky to clear quartz as above. No shows. SILTSTONE: as above. COAL: as above.
1720 - 1725m	90  10	SANDSTONE: as above, rarely fine to very coarse grained, dominantly coarse. Suspect most of fine fraction lost through screens and shakers. SILTSTONE: as above.
1725 - 1730m	90 10	SANDSTONE: as above, no shows. SILTSTONE: as above.

- 19 -

1730 - 1735m	80 20 trace	SANDSTONE: as above, no shows. SILTSTONE: as above. COAL
1735 - 1740m	100  trace trace	SANDSTONE: dominantly milky loose quartz, more angular - dominantly subangular, commonly angular; broken fractured appearance, some very coarse grains are quartz cemented aggregates - occasional crystal faces visible. No shows. SILTSTONE COAL
1740 - 1745m	90 10 trace	SANDSTONE: as above, up to granule size quartz cemented. SILTSTONE: as above. COAL
1745 - 1750m	80 20 trace abundant	SANDSTONE: as above. SILTSTONE: as above. COAL CAVINGS: glauconitic siltstone, calcareous shale.
1750 - 1755m	100  trace common	SANDSTONE: as above, less fractured, more rounded grains, loose grains. SILTSTONE CAVINGS
1755 - 1760m	100	SANDSTONE: 1) common loose grains as above; 2) common quartzose aggregates - very hard, extremely well cemented, light brown, common dark lithic grains, medium to coarse grained, moderately sorted, slightly calcareous, subangular grains, abundant cream yellow mineral fluorescence - dolomite and siliceous cement, no visible porosity, no shows.
1760 - 1765m	100  trace trace common	SANDSTONE: loose quartz and well cemented aggregates as above. SILTSTONE COAL CAVINGS
1765 - 1770m	100  trace	SANDSTONE: dominantly dolomitic aggregates with cream yellow mineral fluorescence. SILTSTONE
1770 - 1775m	90 10	SANDSTONE: as above. SILTSTONE: 1) light to dark brown, micaceous, carbonaceous specks, soft to firm, rounded, quartzose, slightly argillaceous; 2) white to very light brown, soft, rounded, very clayey grading to claystone. Probably being washed out.
1775 - 1780m	80  20	SANDSTONE: mostly loose angular to subangular grains, medium to very coarse (fine sand reported from desanders). Also common dolomitic aggregates with mineral fluorescence. No shows. SILTSTONE: light brown, clayey, as above, mostly being washed out. Also minor dark brown siltstone.

- 20 -

1780 - 1785m	70 30 trace trace	SANDSTONE: as above. SILTSTONE: as above. COAL MICA FLAKES
1785 - 1790m	90  10 trace trace trace	SANDSTONE: loose quartz grains, fine (from desanders) to very coarse, dominantly coarse, angular to dominantly subangular, moderately sorted, inferred very good porosity, no shows. Minor aggregates as above. SILTSTONE: as above. COAL MICA CAVINGS
1790 - 1795m	100  trace	SANDSTONE: clear to milky loose quartz grains as above. SILTSTONE
1795 - 1800m	100 trace	SANDSTONE: as above. SILTSTONE
1800 - 1805m	100 trace trace	SANDSTONE: as above. SILTSTONE PYRITE
1805 - 1810m	100	SANDSTONE: as above, occasional dolomitic aggregates.
1810 - 1815m	100      trace	SANDSTONE: 1) loose quartz grains as above, trace of grey quartz grains; 2) white to light grey quartzose aggregates, very hard angular cuttings, fine to coarse grained, dominantly medium, angular to dominantly subangular grains, moderately sorted, extremely well cemented - siliceous and dolomitic cement, patchy cream mineral fluorescence, no cut. PYRITE
1815 - 1820m	100  trace trace	SANDSTONE: aggregates and loose grains as above. SILTSTONE PYRITE
1820 - 1825m	100  trace trace trace	SANDSTONE: dominantly dolomitic aggregates as above. SILTSTONE PYRITE CAVINGS
1825 - 1830m	100	SANDSTONE: abundant dolomitic aggregates with patchy cream mineral fluorescence.
1830 - 1835m	100	SANDSTONE: dolomitic aggregates and loose quartz grains.
1835 - 1840m	90 10  trace trace	SANDSTONE: loose grains and aggregates. SILTSTONE: light brown, soft, clayey, mostly being washed out. COAL CLAYSTONE: white.

1840 - 1845m	100	SANDSTONE: dominantly loose quartz grains, medium to very coarse, dominantly coarse (fine probably not being seen in samples), angular to dominantly subangular. Minor dolomitic aggregates. No shows.
	trace	SILTSTONE
	trace	COAL
	trace	CAVINGS
1845 - 1850m	90	SANDSTONE: as above.
	10	SILTSTONE: light to dark brown, soft, clayey to carbonaceous.
	trace	COAL
1850 - 1855m	100	SANDSTONE: dominantly loose grains as above, minor dolomitic aggregates with mineral fluorescence.
	trace	SILTSTONE
	trace	COAL
1855 - 1860m	80	SANDSTONE: common dolomitic aggregates and loose grains as above.
	10	COAL: black, hard, angular, earthy texture.
	10	SILTSTONE: light brown, soft, clayey.
1860 - 1865m	80	SANDSTONE: as above.
	20	SILTSTONE: white to light brown, clayey, very soft, being washed out.
	trace	COAL
1865 - 1870m	70	SANDSTONE: loose grains and aggregates with cream mineral fluorescence.
	30	SILTSTONE: as above, quartzose, micromicaceous, microcarbonaceous.
	trace	COAL
1870 - 1875m	50	SANDSTONE: dominantly loose grains, few aggregates.
	40	COAL: black, hard, angular, vitreous.
	10	SILTSTONE: as above.
1875 - 1880m	60	COAL: as above, rare instant cream cut.
	40	SANDSTONE: as above.
	trace	SILTSTONE
1880 - 1885m	70	COAL: as above.
	30	SANDSTONE: loose grains as above.
	trace	SILTSTONE
1885 - 1890m	70	SANDSTONE: loose grains as above.
	20	SHALE: light brown to brown, soft to firm, blocky to subfissile, carbonaceous, silty in part, also very microcarbonaceous in part, pyritic in part.
	10	COAL: as above.
	trace	SILTSTONE: clayey.

- 22 -

1890 - 1895m	60	SANDSTONE: loose clear quartz grains, rarely fine to very coarse, dominantly coarse, dominantly subangular to subrounded, poorly sorted, inferred good visible porosity, no shows.
	20	CLAYSTONE: white to very light brown, soft, dispersive, slightly silty.
	10	SHALE: brown, as above, more silty.
	10	COAL: as above.
1895 - 1900m	60	SANDSTONE: as above.
	20	SHALE/SILTSTONE: brown, carbonaceous, probably being washed out, as above.
	10	CLAYSTONE: white, very soft, being washed out.
	10	COAL: as above.
1900 - 1905m	90	SANDSTONE: 1) loose quartz grains as above; 2) dolomite cemented aggregates as previously described with cream mineral fluorescence.
	10	SHALE/SILTSTONE: as above, dominantly shaley siltstone.
	trace	CLAYSTONE
	trace	COAL
1905 - 1910m	100	SANDSTONE: loose quartz and minor aggregates as above.
	trace	SILTSTONE
	trace	CLAYSTONE
	trace	COAL
1910 - 1915m	100	SANDSTONE: as above, slightly finer.
	trace	SILTSTONE
	trace	COAL
1915 - 1920m	80	COAL: black, angular, vitreous.
	20	SANDSTONE: as above.
1920 - 1925m	80	COAL: as above.
	20	SANDSTONE: as above.
1925 - 1930m	70	COAL: as above.
	30	SANDSTONE: as above.
	trace	SILTSTONE
1930 - 1935m	90	COAL: as above.
	10	SANDSTONE: as above.
	trace	SILTSTONE
1935 - 1940m	50	SANDSTONE: loose quartz grains as above.
	20	COAL: as above.
	20	SHALE/SILTSTONE: brown to brown grey, firm, blocky to subfissile, slightly to very carbonaceous, argillaceous grading to shale.
	10	CLAYSTONE: white, soft.
1940 - 1945m	40	SILTSTONE: brown to brown grey, carbonaceous as above.
	30	SANDSTONE: as above.
	20	CLAYSTONE: as above.
	10	COAL: as above.

1945 - 1950m	50	COAL: black, hard, angular, vitreous.
	20	SHALE/SILTSTONE: as above.
	20	SANDSTONE: as above.
	10	CLAYSTONE: as above, being washed out.
1950 - 1955m	70	SANDSTONE: loose milky quartz grains, rarely fine to very coarse, dominantly coarse, angular to subrounded, dominantly subrounded, moderately sorted, rare pyrite cement on grains, inferred moderate porosity, no shows.
	20	SILTSTONE: brown to brown grey, grading to shale, very carbonaceous.
	10	CLAYSTONE: white to light brown, very soft, slightly carbonaceous, silty.
	trace	COAL
1955 - 1960m	90	SANDSTONE: as above, but more rounded, - dominantly subrounded, occasionally rounded.
	10	SILTSTONE: as above.
	trace	CLAYSTONE
1960 - 1965m	60	SANDSTONE: as above.
	20	CLAYSTONE: as above, - being washed out.
	10	COAL: as above.
	10	SILTSTONE: shaley, as above.
1965 - 1970m	70	COAL: as above.
	20	SANDSTONE: as above.
	10	CLAYSTONE: as above.
	trace	PYRITE
1970 - 1975m	trace	SILTSTONE
	40	CLAYSTONE: white to very light brown, soft to firm.
	30	SANDSTONE: as above.
	20	COAL: as above.
	10	SILTSTONE: as above.
1975 - 1980m	trace	PYRITE
	60	SANDSTONE: as above, common pyrite cement.
	20	SILTSTONE: as above.
	20	CLAYSTONE: as above.
	trace	COAL
1980 - 1985m	60	SANDSTONE: as above, trace in tray of slow blooming weak cream cut, no fluorescence. Possible contamination from coal.
	20	CLAYSTONE: as above.
	10	SILTSTONE: as above.
	10	COAL: as above, trace of instant cream yellow cut.
1985 - 1990m	50	SANDSTONE: as above, occasional medium grained aggregates, subangular to subrounded, moderately to well sorted, weakly cemented. Trace of blooming slow cream cut, contamination by coal?
	30	COAL: as above, trace of cream to milky white cut.
	10	SILTSTONE: as above.
	10	CLAYSTONE: as above.

- 24 -

1990 - 1995m	70	SANDSTONE: as above.
	20	SHALE/SILTSTONE: brown, as above.
	10	CLAYSTONE: as above.
	trace	PYRITE
	trace	COAL
1995 - 2000m	50	SHALE/SILTSTONE: brown, microcarbonaceous, micromicaceous, as above.
	30	SANDSTONE: as above, common pyrite cemented aggregates.
	20	CLAYSTONE: as above.
	trace	PYRITE
	trace	COAL
2000 - 2005m	40	SANDSTONE: as above.
	30	SHALE/SILTSTONE: as above.
	20	COAL: as above.
	10	CLAYSTONE: as above.
	trace	PYRITE
2005 - 2010m	50	SANDSTONE: loose grains, minor pyrite cemented aggregates.
	20	COAL: as above.
	20	SHALE/SILTSTONE: as above.
	10	CLAYSTONE: as above.
2010 - 2015m	40	SANDSTONE: as above, minor pyrite cement.
	30	SHALE/SILTSTONE: brown to brown grey, carbonaceous, as above.
	20	COAL: as above.
	10	CLAYSTONE: as above.
2015 - 2020m		Abundant cavings after bit trip.
2020 - 2025m	50	CAVINGS: calcareous siltstone, sandstone.
	30	COAL: black, hard, angular, dull, earthy.
	10	SHALE/SILTSTONE: brown to brown grey, carbonaceous.
	10	CLAYSTONE: as above.
2025 - 2030m	60	SILTSTONE: brown grey to light grey, soft to firm, blocky, slightly argillaceous, micaceous, slightly carbonaceous, quartzose.
	20	SANDSTONE: dominantly quartzose aggregates, moderately friable, very fine to medium grained, dominantly fine, grades to siltstone matrix, subangular, well sorted, non calcareous, minor siliceous cement. 5% bright cream fluorescence with slow diffuse cream to milky cut and moderately milky-cream crush cut; minor loose quartz as above.
	10	SHALE/SILTSTONE: brown, carbonaceous as above.
	10	COAL: probably cavings.
	abundant	CAVINGS



2030 - 2035m	50	SANDSTONE: aggregates as above. Also common loose grains, very fine to medium, dominantly fine. Micaceous in part, grades to siltstone. Moderate to poor visible porosity, 15% cream fluorescence and weak cut with good crush cut as above.
	30	SANDSTONE: grey, micaceous, grading to very fine sandstone as above.
	10	SHALE/SILTSTONE: probably cavings.
	10 common	COAL: cavings. CAVINGS: calcareous siltstone, claystone.
2035 - 2040m	50	SANDSTONE: loose grains and aggregates as above, slightly argillaceous and slightly carbonaceous in part. 20% fluorescence and strong crush cut as above.
	30	CLAYSTONE: soft, white, silty as previously described.
	10	SILTSTONE: sandy, micaceous as above.
	10 common	SHALE/SILTSTONE: as above. CAVINGS
2040 - 2045m	60	SILTSTONE: light grey, quartzose, argillaceous, slightly micaceous, soft and friable to firm, grades to silty claystone in part.
	20	SANDSTONE: fine to medium aggregates as above, minor loose grains, minor loose coarse grains - cavings. 5% fluorescence and cut as above.
	20	COAL: as above.
	trace	PYRITE
	trace trace	CLAYSTONE CARBONACEOUS SHALE
2045 - 2050m	80	SILTSTONE: as above, grading to claystone.
	10	COAL: as above.
	10	SANDSTONE: as above, trace of show as above.
	trace	SHALE
2050 - 2055m	60	SILTSTONE: light grey, clayey as above; light to dark brown, slightly speckled colour, quartzose, argillaceous, carbonaceous specks and occasional laminae, slightly micromicaceous, moderately friable.
	40	SANDSTONE: dominantly fine grained, loose grains and moderately friable aggregates as above. Trace of show as above.
	trace	MICA
	trace	PYRITE
	trace common	COAL CAVINGS: still abundant cavings coming over shakers, large chips.
2055 - 2060m	50	SILTSTONE: light grey and brown as above.
	50	SANDSTONE: as above, becoming coarser.
	trace	COAL
	trace	MICA

- 26 -

2060 - 2065m	70	SANDSTONE: dominantly loose grains, clear quartz, fine to dominantly coarse, dominantly subangular to subrounded, poorly sorted, minor aggregates of fine to medium grain size, argillaceous matrix, as above. Trace of show.
	30	SILTSTONE: grey, clayey and brown carbonaceous as above.
	trace trace	COAL PYRITE
2065 - 2070m	80	SANDSTONE: as above, trace of show.
	20	SILTSTONE: as above.
	trace	COAL
2070 - 2075m	70	SANDSTONE: as above, trace of weak show.
	30	SILTSTONE: as above.
	trace	PYRITE
	trace	MICA FLAKES
	trace	COAL
2075 - 2080m	50	SILTSTONE: white and clayey, brown and carbonaceous as above.
	40	SANDSTONE: dominantly loose fine to coarse grains, minor aggregates as above.
	10	COAL: as above, cavings, strong gold yellow cut from several chips.
2080 - 2085m	90	SANDSTONE: loose grains as above, dominantly coarse, occasionally very coarse, no shows.
	10	SILTSTONE: as above.
	trace	PYRITE
	trace	COAL
2085 - 2090m	90	SANDSTONE: as above, no shows.
	10	SILTSTONE: grey and brown, as above.
	trace	COAL
	trace	PYRITE
2090 - 2095m	70	SANDSTONE: as above.
	20	SILTSTONE: as above.
	10	COAL: as above.
2095 - 2100m	90	SANDSTONE: as above, common quartzose aggregates, fine to medium grained, occasionally coarse, moderately friable to moderately hard, subangular, minor siliceous cement, very slightly argillaceous.
	10	SILTSTONE: as above.
2100 - 2105m	80	SANDSTONE: dominantly loose clear quartz grains, fine to very coarse, dominantly coarse, angular to dominantly subangular, moderately sorted, inferred moderate porosity; minor aggregates - fine to medium, moderately friable, white clay matrix, well sorted. No shows.
	20	SILTSTONE: white to light brown, clayey and brown, carbonaceous as above.
	trace	COAL

2105 - 2110m	70	SANDSTONE: as above, common aggregates, becoming silty, no shows.
	30	SILTSTONE: as above.
	trace	COAL
2110 - 2115m	100	SANDSTONE: as above, loose quartz, very few aggregates, no shows.
	trace	SILTSTONE
	trace	MICA FLAKES
2115 - 2120m	80	SANDSTONE: as above, minor aggregates - more common than above.
	20	SILTSTONE: as above, sandy in part.
	trace	COAL
	trace	PYRITE
2120 - 2125m	70	SANDSTONE: as above, common aggregates with clay matrix.
	30	SILTSTONE: as above, dominantly white clayey siltstone, being washed out.
	trace	COAL
	trace	PYRITE
2125 - 2130m	70	SANDSTONE: fine to very coarse loose grains - clayey aggregates as above, slightly micaceous in part, slightly carbonaceous in part, rare pyrite cement.
	30	SILTSTONE: mostly whitish, clayey, sandy grading to fine grained sandstone - also brown, carbonaceous.
	trace	COAL
	trace	PYRITE
2130 - 2135m	60	SANDSTONE: as above, no shows.
	30	SILTSTONE: clayey sandy siltstone as above, grades to fine grained sandstone.
	10	COAL: as above.
	trace	CLAYSTONE
2135 - 2140m	40	SANDSTONE: fine to coarse grained as above, no shows.
	40	SILTSTONE: very clayey, dispersive, being washed out, as above.
	20	COAL: black, hard, angular, earthy.
	trace	MICA
2140 - 2145m	70	SANDSTONE: loose grains, fine to very coarse, dominantly coarse, poorly sorted, angular to dominantly subangular; aggregates - fine to dominantly medium, moderately friable to moderately cemented, angular to dominantly subangular, poorly sorted, non calcareous siliceous cement, trace of dull gold mineral fluorescence, no cut - rare dolomite cement.
	30	SILTSTONE: grey and brown as above.
	trace	COAL

2145 - 2150m	80	SANDSTONE: as above, dominantly loose quartz but also common aggregates. 5% dull cream fluorescence, with slow blooming to diffuse cream cut and strong cream milky crush cut.
	20	SILTSTONE: as above.
	trace	COAL
	trace	PYRITE
2150 - 2155m	90	SANDSTONE: as above, 10% from aggregates of fluorescence as above, weak cream cut, moderate cream crush cut.
	10	SILTSTONE: as above.
	trace	PYRITE
	trace	MICA
2155 - 2157m (Bottoms Up)	80	SANDSTONE: as above, 10% show as above.
	20	SILTSTONE: as above.
	trace	COAL
2157 - 2160m	80	SANDSTONE: as above, 5% show as above.
	20	SILTSTONE: as above.
	trace	COAL
2160 - 2165m	80	SANDSTONE: loose quartz, fine to very coarse, dominantly coarse, poorly sorted, subangular. Also aggregates - moderately friable, minor clay matrix, very slightly carbonaceous. 10% dull cream fluorescence with slow weak diffuse cream cut and moderate milky cream crush cut.
	20	SILTSTONE: as above.
	trace	PYRITE
	trace	COAL
	abundant	Clay and silt over shakers - being washed out.
2165 - 2170m	50	SILTSTONE: white to light grey, soft, clayey as above. Cuttings very sticky over shakers.
	50	SANDSTONE: dominantly loose quartz grains, clear, fine to very coarse, dominantly coarse, subangular to subrounded, poorly sorted, inferred moderate porosity. Also minor aggregates - moderately friable, fine to medium grained, moderately sorted, minor clay matrix, moderately cemented - siliceous cement, moderate to poor visible porosity. 3-5% dull cream fluorescence, weak slow cream cut, weak to moderate milky cream crush cut.
	trace	COAL
	trace	PYRITE
		POOH, cut Cores 1 and 2.
		Core No. 1 2170 - 2188m
		Core No. 2 2188 - 2205.5m

2205.5 - 2210m	50	SANDSTONE: predominantly loose quartz, clear to translucent, medium to very coarse grained, angular to subangular, poorly sorted. Also quartz aggregates - very light grey to light grey, friable to very friable, fine to medium, subangular to subrounded, poor to moderate sorting, siliceous cement, carbonaceous to coaly inclusions, poor visual porosity, trace dull white-cream fluorescence, slow, diffuse cut and crush cut.
	40	SILTSTONE: light grey to medium light grey, firm, blocky, rounded cuttings, common very fine to fine grained quartz inclusions, occasional fine grain size carbonaceous inclusions.
	10	CLAYSTONE: very light grey to occasionally light brown, soft, slightly sticky, blocky cuttings, calcareous in parts.
	trace	SHALE: medium dark grey to brown, firm to soft, subfissile, carbonaceous.
	trace	PYRITE: microcrystalline aggregates.
2210 - 2215m	50	SILTSTONE: light grey to brownish grey, otherwise as above.
	30	SANDSTONE: predominantly loose quartz as above. Occasional aggregates as above with fluorescence and cut as above.
	20	CLAYSTONE: dispersive in parts, otherwise as above.
	tr-5	COAL: black, firm, angular cuttings, vitreous.
	trace	SHALE
2215 - 2220m	70	SILTSTONE: predominantly light grey, occasionally brown to reddish brown, otherwise as above.
	20	SANDSTONE: predominantly loose quartz - predominantly medium to coarse, predominantly subangular otherwise as above. Occasional quartz aggregates as above, with dull cream fluorescence and slow very weak crush cut.
	10	CLAYSTONE: dispersive, as above.
	trace	PYRITE
2220 - 2224m (Bottoms Up)	70	SILTSTONE: light grey with occasional red brown to brown.
	20	SANDSTONE: Mostly loose quartz grains, medium to coarse, mostly subangular. Some quartz aggregates. Dull cream fluorescence and very weak crush cut.
	10	CLAYSTONE: white to light grey with some quartz inclusions.
	trace	PYRITE
2224 - 2225m	70	SILTSTONE: very light grey to medium grey, occasionally pale brown, firm to moderately hard, blocky, rounded cuttings, very fine quartz grain inclusions, carbonaceous in parts, occasional ?glaucinite inclusion (cavings?).

	20	SANDSTONE: predominantly loose quartz - clear to translucent, medium to very coarse, subangular to subrounded, occasionally angular, moderate sorting. Also minor quartz aggregates - light grey, friable to very friable, fine to medium grained, subangular to subrounded, moderate sorting, occasional carbonaceous inclusions, poor to moderate visual porosity, rare (3-4 cuttings) have faint dull cream fluorescence and moderate white crush cut.
	10	CLAYSTONE: very light grey to pale brown, soft to very soft, dispersive in parts, sticky, carbonaceous flecking.
	trace	SHALE: dark grey to brown, firm, subfissile, very carbonaceous, grading to coal.
	trace	COAL: black, firm, angular cuttings.
2225 - 2230m	40	SILTSTONE: occasionally reddish brown, otherwise as above.
	30	SANDSTONE: predominantly loose quartz as above. Minor quartz aggregates as above. Trace dull pale yellow fluorescence, no cut or crush cut.
	10	CLAYSTONE: as above, however, no longer dispersive.
	10	SHALE: as above.
	10	COAL: as above.
	trace	PYRITE
2230 - 2231m (Bottoms Up)	40	SILTSTONE: light grey to medium light grey, occasionally reddish brown.
	20	SANDSTONE: mostly loose quartz with occasional quartz aggregates. Dull to yellow to creamy (very little) and no crush cut or cut. Medium to coarse, subangular to subrounded, poor to moderately sorted, moderately hard.
	20	CLAYSTONE: occasional quartz inclusions.
	20	COAL: as above.
2231 - 2235m	60	SILTSTONE: white to light grey as above, clayey, sandy grading to silty sandstone in part..
	20	COAL: black, as above, earthy texture, grades to a very carbonaceous shale.
	20	SANDSTONE: loose grains and aggregates as above, 2-3% dull cream yellow fluorescence, no cut or crush cut - mineral fluorescence probably dolomite cement in aggregates.
2235 - 2240m	60	SILTSTONE: moderately friable, sandy in part, clayey in part, as above.
	30	SANDSTONE: as above, common aggregates with dull mineral fluorescence.
	10	SHALE: brown to dark brown, firm to hard, subfissile, carbonaceous, grading to earthy coal, micromicaceous.
	trace	PYRITE
	trace	MICA

2240 - 2245m	60	SANDSTONE: loose quartz grains, fine to dominantly medium, occasionally coarse, subangular to subrounded, poorly to moderately sorted; common quartzose aggregates - moderately friable, occasionally hard, fine to medium grained, subangular, moderately sorted, minor clay matrix in part, moderately cemented in part, slightly micaceous in part, carbonaceous in part, occasionally pyrite cement, occasionally slightly calcareous, minor siliceous and dolomitic cement. Poor to moderate visible porosity. Common dull cream yellow mineral fluorescence, no cut. Minor very fine grained silty aggregates.
	30	SILTSTONE: as above.
	10	SHALE: brown, silty, carbonaceous.
	trace trace trace	COAL PYRITE MICA
2245 - 2250m	70	SANDSTONE: as above.
	20	SILTSTONE: as above, sandy.
	10	SHALE: as above, grading to coal, silty.
	trace trace	CLAYSTONE COAL
2250 - 2255m	60	SANDSTONE: as above, dominantly aggregates, common mineral fluorescence.
	30	SILTSTONE: as above.
	10	SHALE: carbonaceous, as above.
2255 - 2260m	70	SILTSTONE: white to light grey, soft to firm, quartzose, micromicaceous, slightly carbonaceous (very small specks), clayey in part, grading to claystone, sandy in part, grading to very fine grained sandstone.
	20	SANDSTONE: as above.
	10	SHALE: brown, carbonaceous as above. From several very carbonaceous silty cuttings - instant fast streaming cream cut.
	trace trace	COAL CLAYSTONE
	2260 - 2265m	80
20		SANDSTONE: as above.
trace trace		SHALE CLAYSTONE
2265 - 2270m		50
	30	COAL: black, hard, angular, earthy texture.
	10	SHALE: brown, carbonaceous grading to coal in part, silty.
	10	SANDSTONE: as above.
2273m (Spot Sample)	50	SILTSTONE: as above.
	30	SANDSTONE: as above, trace bright cream fluorescence with very slow diffuse cut and moderate cream crush cut.
	20	SHALE: brown, becoming siltier, carbonaceous.

2270 - 2275m	60	SILTSTONE: very light grey to medium dark grey, also tan, firm to moderately hard in parts, blocky cuttings, very carbonaceous in parts (darker cuttings), very fine quartz grain inclusions (common in light cuttings).
	10	SHALE: medium dark grey to brown, firm, blocky to subfissile, carbonaceous.
	30	SANDSTONE: predominantly loose quartz, translucent, medium to fine grained, subangular to subrounded, occasionally angular, moderate sorting. No shows. Also minor quartzose aggregates - very light grey, friable to moderately hard, very fine to medium grained, predominantly fine, moderately well sorted, dolomitic cement, well cemented in parts, common carbonaceous inclusions, poor to locally moderate visual porosity, dull pale yellow mineral fluorescence (dolomite cement). Trace of less well cemented aggregates have bright white fluorescence and very slow diffuse white cut and crush cut.
	trace	PYRITE: microcrystalline aggregates.
2275 - 2280m	60	SILTSTONE: as above.
	40	SANDSTONE: loose quartz - occasionally coarse, otherwise as above. Quartz aggregates - with mica and occasional glauconite inclusions, otherwise as above. Mineral fluorescence as above. 5% patchy bright white fluorescence, and slow white streaming cut, instant diffuse white crush cut.
	trace	COAL
2280 - 2285m	trace	SHALE
	70	SANDSTONE: loose quartz - predominantly subrounded otherwise as above. Quartz aggregates - friable to very friable, otherwise as above. Mineral fluorescence as above. Trace to 5% patchy, bright white fluorescence, slow diffuse white cut and crush cut.
	30	SILTSTONE: as above.
2285 - 2290m	trace	CLAYSTONE: white to very light grey, very soft, slightly sticky.
	80	SANDSTONE: predominantly loose quartz - as above. Also quartzose aggregates - as above (ie. friable to very friable) with mineral fluorescence as above. Trace bright white fluorescence, with very slow diffuse white cut and crush cut.
	20	SILTSTONE: as above.
2294m (Bottoms Up)	trace	CLAYSTONE: as above.
	60	SILTSTONE: dominantly light grey and some reddish brown, friable to moderately hard. Carbonaceous in parts.
	10	SANDSTONE: white to translucent, mostly loose grains with some aggregates. Moderately hard to very hard. Medium grained, subangular to subrounded, well sorted, 10% fluorescence - dominantly dull yellow and some dull to bright white. Slow streaming white cut and milky crush cut (weak).



	10	SHALE: mostly light grey, as above.
	10	CLAYSTONE: white to very light grey, very soft, as above.
	10	COAL: as above.
2290 - 2295m	50	SILTSTONE: as above, tending to moderately hard.
	40	SANDSTONE: loose quartz - occasionally angular, otherwise as above. Predominantly quartz aggregates as above, with mineral fluorescence as above, and trace bright white fluorescence with weak slow diffuse to streaming white cut and crush cut.
	10	SHALE: as above.
2295 - 2300m	60	SANDSTONE: loose quartz - as above. Predominantly quartz aggregates as above, with mineral fluorescence and occasional cuttings with patchy white fluorescence and very slow streaming white cut, with faint diffuse white crush cut.
	30	SILTSTONE: as above.
	10	SHALE: as above, and occasionally pale brown.
2300 - 2305m	70	SANDSTONE: loose quartz grains and quartzose aggregates as above, - mineral fluorescence as above with occasional cuttings with patchy white fluorescence and slow weak white diffuse cut and crush cut.
	30	SILTSTONE: as above.
	trace	SHALE
	trace	COAL
2305 - 2310m	80	SANDSTONE: loose quartz grains - clear to translucent, fine to coarse grained, predominantly fine to medium, angular to subrounded, poorly sorted, no shows. Quartz aggregates - as above with dull patchy yellow mineral fluorescence.
	20	SILTSTONE: as above.
	trace	COAL
2310 - 2315m	80	SANDSTONE: predominantly loose quartz - predominantly medium to coarse grained, occasionally very coarse, predominantly subangular to subrounded, otherwise as above. Minor quartz aggregates as above with dull yellow mineral fluorescence.
	20	SILTSTONE: as above.
	trace	PYRITE
2315 - 2320m	90	SANDSTONE: predominantly loose quartz grains - clear to translucent, fine to very coarse grained, predomiannly medium to coarse, subangular to subrounded, poorly sorted. No shows. Occasional quartz aggregates - as above, with mineral fluorescence as above.

	10	SILTSTONE: very light grey to medium light grey, occasionally brownish grey, firm to moderately hard in parts, blocky cuttings, very fine to silt sized quartz grain inclusions, carbonaceous (especially darker cuttings).
	trace	PYRITE: microcrystalline aggregates, also in aggregates surrounding quartz grains.
2320 - 2325m	90	SANDSTONE: predominantly loose grains - as above. Also quartzose aggregates - very light grey, translucent quartz grains, friable, very friable in parts, fine to medium grained, predominanty medium, subrounded, moderate sorting, dolomite cement, common medium grain size carbonaceous inclusions, poor to moderate visual porosity, cream to dull yellow mineral fluorescence.
	10	SILTSTONE: as above.
	trace	SHALE: dark grey to black, firm, subfissile, very carbonaceous.
2325 - 2330m	90	SANDSTONE: predominantly loose quartz grains, dominantly medium to coarse, also very coarse, subrounded, otherwise as above. Occasional quartz aggregates as above.
	tr-5	SILTSTONE: as above.
	tr-5	COAL: black, firm, angular cuttings, vitreous in parts.
	trace	PYRITE: microcrystalline aggregates.
2330 - 2335m	70	SANDSTONE: predominantly loose quartz - subangular to subrounded, otherwise as above. Occasional quartz aggregates as above.
	20	SHALE: brown, firm, subfissile to fissile in parts, very carbonaceous.
	10	COAL: black, firm to moderately hard, angular cuttings, vitreous.
	trace	SILTSTONE: light grey to buff, medium dark grey to brownish grey, firm to moderately hard in parts, blocky cuttings, carbonaceous in parts (darker cuttings).
2335 - 2340m	70	SANDSTONE: predominantly loose quartz - medium to very coarse, predominantly coarse, otherwise as above. Minor aggregates as above.
	20	SHALE: as above.
	10	SILTSTONE: as above.
	trace	COAL
	trace	PYRITE
2340 - 2345m	80	SANDSTONE: predominantly loose quartz - predominantly medium to coarse and subangular, otherwise as above. Occasional friable quartzose aggregates as above.
	10	SILTSTONE: as above.
	10	COAL: black, firm, angular cuttings, vitreous, subconchoidal fracture in parts..
	trace	SHALE: brown, firm, blocky to subfissile, carbonaceous.

2345 - 2350m	30	SANDSTONE: loose quartz as above.
	30	SHALE: brown to brown grey, carbonaceous as above.
	30	COAL: as above.
	10	SILTSTONE: as above.
2350 - 2355m	trace	PYRITE
	40	SHALE: brown to dark brown, microcarbonaceous and carbonaceous, silty, grading to carbonaceous siltstone.
	30	COAL: as above.
	20	SILTSTONE: grey, as above.
2355 - 2360m	10	SANDSTONE: as above.
	30	SHALE: as above, silty in part.
	30	SILTSTONE: as above,
	20	ALTERED VOLCANICS: light brown to olive brown, occasionally olive grey, occasional light green, soft to hard, blocky to angular cuttings, crystalline texture with acicular translucent crystals visible. Altered to light brown clay which forms matrix between crystals; commonly pyritic, some very altered cuttings have silty texture.
2360 - 2365m	20	SANDSTONE: as above, occasional pyrite cemented aggregates.
	trace	COAL
	30	SILTSTONE: as above, becoming clayey.
	20	SANDSTONE: as above, some very fine grained aggregates. No shows.
2365 - 2370m	10	SHALE: as above.
	30	ALTERED VOLCANICS: as above.
	10	CLAYSTONE: white to very light grey, very soft, very sticky, dispersive, pyritic in part.
	trace	COAL
2370 - 2375m	trace	PYRITE
	40	SILTSTONE: as above, sandy grading to very fine grained sandstone.
	20	SANDSTONE: dominantly aggregates, fine to medium; also very fine grained aggregates; also loose grains, medium to coarse.
	20	SHALE: as above, grading to earthy coal, also silty grading to carbonaceous siltstone in part.
2370 - 2375m	10	ALTERED VOLCANICS: as above.
	10	COAL: black, hard, angular, earthy.
	trace	CLAYSTONE
	60	SILTSTONE: as above, sandy grading to very fine grained sandstone.
2370 - 2375m	20	SANDSTONE: as above.
	20	SHALE: as above.
	trace	VOLCANICS
	trace	PYRITE
2370 - 2375m	trace	CLAYSTONE

2375 - 2380m	40	SANDSTONE: dominantly loose quartz grains, transparent to translucent, fine to very coarse grained, dominantly coarse, subangular, poorly sorted; quartzose aggregates, moderately friable, fine to dominantly medium, occasionally coarse, subangular to subrounded, moderately sorted, slightly carbonaceous, minor clay matrix, minor pyrite cement, slightly calcareous, minor calcite cement, poor visible porosity. No shows.
	30	SILTSTONE: as above, sandy grading to very fine grained silty sandstone.
	20	SHALE: as above.
	10	VOLCANICS: altered as above, occasional cuttings have quartz grains within volcanic matrix.
2380 - 2385m	50	SANDSTONE: dominantly loose grains, fine to dominantly medium, occasionally coarse and very coarse, moderately to well sorted, subangular to dominantly subrounded. Possibly washed out from siltstone.
	40	SILTSTONE: dominantly dark grey, firm to very hard, blocky to angular cuttings, very hard cuttings are brittle, quartzose, sandy - fine to coarse grained quartz, argillaceous, slightly carbonaceous, slightly micromicaceous, appears to be well cemented, possibly siliceous cement, non calcareous.
	10	SHALE: silty, as above.
2385 - 2390m	70	SILTSTONE: as above.
	30	SANDSTONE: predominantly loose quartz grains, subangular to occasionally angular, otherwise as above. Occasional aggregates as above.
	trace	SHALE
	trace	ALTERED VOLCANICS
	trace	CLAYSTONE: light grey, very soft, sticky. PYRITE: microcrystalline aggregates.
2390 - 2395m	50	SILTSTONE: as above.
	40	SANDSTONE: predominantly loose quartz grains, clear to translucent, occasionally smoky, fine to very coarse grained, predominantly medium to coarse, poorly sorted, angular to rounded, predominantly subangular to subrounded, no shows. Occasional aggregates as above.
	tr-5	COAL: black, brittle, angular cuttings, generally vitreous.
	10	SHALE: brown to dark grey, firm, blocky to fissile, carbonaceous to very carbonaceous.
	trace	PYRITE
2395 - 2400m	50	SILTSTONE: light to medium dark grey, firm to moderately hard, blocky to angular cuttings, carbonaceous flecking to carbonaceous inclusions, fine to medium, generally subrounded quartz grain inclusions.

- 37 -

	40	SANDSTONE: predominantly loose quartz grains as above, occasional fine to medium grained, friable quartz aggregates as above.
	10	SHALE: as above.
	trace	PYRITE: microcrystalline aggregates also as cement in occasional quartz aggregates.
2400 - 2405m	50	SANDSTONE: predominantly loose quartz grains as above. Occasional quartz aggregates - very light grey, translucent quartz grains, friable to moderately hard, fine to medium subrounded grains, moderately well sorted, siliceous cement, occasional trace of dolomitic cement - dull yellow mineral fluorescence, poor visual porosity, no shows.
	30	SILTSTONE: as above.
	10	ALTERED VOLCANICS: cream, green to greenish grey, firm to brittle, blocky cuttings, crystalline texture, glassy to green crystals visible.
	10	SHALE: as above.
2405 - 2410m	50	ALTERED VOLCANICS: very light grey to cream, pink to crimson, pale green to occasionally clear glassy green, firm to moderately hard, predominantly firm, blocky to angular cuttings, green glassy crystals visible - crystals generally acicular, at times grades to very soft clay with glassy crystals visible.
	40	SANDSTONE: predominantly loose quartz grains as above, occasional sandstone aggregates as above.
	10	SILTSTONE: as above.
2410 - 2415m	50	SANDSTONE: predominantly loose quartz - clear to translucent, medium to coarse grained, occasionally fine or very coarse grains, subangular to rounded, predominantly subrounded to rounded, poor to moderate sorting, no shows. Also occasional quartzose aggregates as above.
	40	ALTERED VOLCANICS: as above.
	10	SILTSTONE: as above.
2415 - 2420m	50	SANDSTONE: predominantly loose quartz grains as above. Occasional quartzose aggregates as above.
	40	ALTERED VOLCANICS: as above.
	10	SILTSTONE: predominantly medium grey, firm to moderately hard, blocky cuttings with fine to medium subrounded to rounded quartz grain inclusions; carbonaceous inclusions and flecking.
	trace	PYRITE: microcrystalline aggregates.
2420 - 2425m	40	SANDSTONE: predominantly loose quartz as above. Occasional quartzose aggregates as above.
	40	ALTERED VOLCANICS: as above.

	20	SILTSTONE: as above, also tending to brown.
	trace	CLAYSTONE: white to very light grey, very soft, occasionally slightly sticky.
	trace	PYRITE: as above, and occasionally as cement in aggregates.
	trace	DOLOMITE: brownish grey, hard, angular cuttings.
2425 - 2430m	50	SANDSTONE: predominantly loose quartz grains as above. Very occasional quartz aggregates as above.
	30	ALTERED VOLCANICS: as above.
	20	SILTSTONE: as above.
	trace	SHALE: brown, firm, subfissile to fissile, carbonaceous.
	trace	COAL: black, firm, brittle, angular cuttings, vitreous.
		NB. Spot Sample at 2429m 30% Coal
	trace	DOLOMITE
	trace	PYRITE
2430 - 2435m	30	SANDSTONE: as above.
	30	SILTSTONE: as above.
	20	VOLCANICS: multicoloured as above.
	10	SHALE: brown, carbonaceous, as above.
	10	COAL: as above.
2435 - 2440m	20	SANDSTONE: as above.
	60	SILTSTONE: light grey to light brown, clayey, grading to silty claystone.
	20	VOLCANICS: multicoloured as above.
	trace	COAL
	trace	SHALE
2440 - 2445m	60	SILTSTONE: as above.
	20	SANDSTONE: as above.
	20	VOLCANICS: as above.
		At 2445m POOH to run logs (did not circulate bottoms up prior to POOH).
2445 - 2450m	30	SANDSTONE: mostly translucent. Dominantly loose quartz with a few hard and a few soft aggregates (ie. variable). Medium grained with occasional coarse grains. Subangular to subrounded, moderately to well sorted.
	30	VOLCANICS: colours variable - light grey to reddish brown as above.
	20	SILTSTONE: light grey to light brown, as above.
	10	SHALE: dominantly brownish and often carbonaceous.
	10	DOLERITE: translucent green, black, moderately hard, subangular to angular cuttings, crystalline texture, ?pyroxene crystals.
	trace	COAL
	trace	PYRITE
	trace	DOLOMITE

2450 - 2455m	40	SILTSTONE: very light grey to medium dark grey, also buff, firm, blocky cuttings, occasional carbonaceous flecking,
	30	DOLERITE: as above.
	10	SANDSTONE: predominantly loose quartz, translucent, medium to very coarse, predominantly coarse to very coarse, angular to subrounded, occasional angular granule sized quartz fragments and grains; also occasional quartzose aggregates - very fine to fine grained, well sorted, poor visual porosity.
	10	LIMESTONE: calcilutite: medium light grey to medium grey, very calcareous. Much of the above is interpreted as cavings - also present are forams and bryozoa further supporting the presence of cavings.
	10	ALTERED VOLCANICS: pale green to pink red, firm to moderately hard, acicular crystals visible.
	trace	SHALE: brown, firm, subfissile to fissile, carbonaceous.
2455 - 2460m	trace	PYRITE: microcrystalline aggregates.
	30	DOLERITE: as above.
	30	SANDSTONE: loose quartz - coarse to granule sized, angular to rounded, as above.
	30	SILTSTONE: light grey to medium grey, cream to buff, firm, blocky, rounded cuttings, calcareous in parts, carbonaceous flecking, grades to soft claystone in parts.
	10	ALTERED VOLCANICS: cream, very light grey, pale green, occasionally crimson, firm, angular to subangular cuttings, argillaceous matrix, dominantly acicular, translucent green crystals are common visible.
	trace	PYRITE: as above, and associated with quartz grains.
2460 - 2465m	trace	DOLOMITE: pale brown, moderately hard to hard, angular cuttings.
	trace	SHALE: as above.
	trace	Cavings still present.
	40	DOLERITE: as above.
	30	SILTSTONE: as above.
	20	ALTERED VOLCANICS: as above.
2465 - 2470m	10	SANDSTONE: loose quartz as above.
	trace	SHALE: as above.
	trace	PYRITE: as above.
	trace	COAL: black, brittle, angular cuttings, vitreous. Note: more coal seen in Spot Sample at 2463m.

2470 - 2475m	60	SILTSTONE: as above.
	20	SANDSTONE: predominantly loose quartz - translucent, medium to very coarse, predominantly coarse grained, angular to subrounded, predominantly angular to subangular. No shows. Also - quartzose aggregates, white, clear to translucent quartz grains, friable to moderately hard (brittle), medium to occasionally coarse grained, subrounded to rounded, well sorted, dolomite cement, well cemented, poor visual porosity, 30% moderately bright white fluorescence, with very slow to slow weak white streaming cut, weak white diffuse crush cut (1 cutting had moderately fast diffuse cut). Dull white, residual, film - one cutting had weak brown residue and ring residue - others colourless under white light.
	10	DOLERITE: as above.
	10	SHALE: yellow grey, firm, blocky to subfissile, also brown subfissile to fissile, carbonaceous, as above.
	trace	COAL: black, brittle, angular cuttings.
2475 - 2480m	50	SANDSTONE: predominantly loose quartz - as above, however aggregates are also common. Aggregates - subangular grains in part, otherwise as above. 30% dull to moderately bright patchy white fluorescence, very slow to slow weak white streaming cut, instant weak diffuse crush cut. (1 cutting showed instant strong diffuse crush cut).
	40	SILTSTONE: as above.
	10	DOLERITE: as above.
	trace	SHALE: mostly brown, as above.
	trace	COAL: vitreous, angular.
	trace	PYRITE ALTERED VOLCANICS
2480 - 2485m	90	SANDSTONE: predominantly loose quartz - medium to very coarse, angular to subrounded, translucent grains, moderately well sorted, white pinpoint fluorescence with very slow, extremely weak faint white cut. Trace of aggregates - as above with bright white fluorescence with cut and crush cut as above.
	10	SILTSTONE: as above.
	trace	SHALE
	trace	PYRITE
2485 - 2490m	50	SILTSTONE: firm to soft, otherwise as above.
	40	SANDSTONE: predominantly loose quartz fragment/grains as above. No shows. Minor aggregates as above, with approximately 20% dull patchy white fluorescence and fast weak streaming cut.
	10	CLAYSTONE: very light grey, tan, pale green, soft to very soft, blocky, well rounded cuttings.
	trace	PYRITE: microcrystalline aggregates and occasionally surrounding quartz grains in aggregates.



- 41 -

2490 - 2495m	60	SILTSTONE: as above, with very fine grained quartz inclusions in parts.
	30	SANDSTONE: loose quartz grains/fragments as above. Aggregates as above, with 10% dull patchy white fluorescence and weak very slow streaming cut.
	10	CLAYSTONE: slightly sticky, otherwise as above.
	trace	SHALE: brown, firm, subfissile to fissile, carbonaceous.
	trace	DOLERITE: as above.
2495 - 2500m	50	SILTSTONE: as above.
	30	SANDSTONE: loose quartz fragments/grains as above. Aggregates as above with 10% dull patchy white fluorescence, slow to very slow weak white streaming cut. Also trace fine grained aggregates, very light grey, friable, fine grained, poorly cemented, siliceous cement, moderate visual porosity, no shows.
	20	CLAYSTONE: as above.
2500 - 2505m	50	SILTSTONE: as above.
	50	SANDSTONE: loose quartz - generally better rounded otherwise as above. No shows. Aggregates as above, (medium to coarse grained) with trace to 5% very dull patchy white fluorescence and weak cut as above.
	trace	CLAYSTONE: as above.
	trace	SHALE: as above.
	trace	PYRITE
	trace	DOLERITE
2505 - 2510m	50	SILTSTONE: becoming very sandy in parts, otherwise as above.
	50	SANDSTONE: loose quartz as above, no shows; also quartzose aggregates as above, with a trace of dull faint white fluorescence and no cut.
	trace	SHALE
	trace	PYRITE
2510 - 2515m	60	SILTSTONE: very light grey to medium grey, firm to moderately hard, blocky cuttings, carbonaceous flecking, quartz grain inclusions.
	40	SANDSTONE: 1) loose quartz fragments/grains - clear to translucent, medium to very coarse grained, subangular, moderately well sorted, no shows. 2) quartzose aggregates - translucent to white, friable, medium to occasionally coarse grained, subangular (grains appear cubic or rectangular at times), well sorted, dolomitic cement, well cemented, poor visual porosity, slow, weak streaming white cut. 3) quartzose aggregates - very light grey, friable, very fine grained, well sorted, dolomitic cement, poor to moderate visual porosity, no shows.
	trace	SHALE: brown, firm, subfissile to fissile, carbonaceous.
	trace	PYRITE: microcrystalline aggregates.
	trace	DOLERITE
	trace	ALTERED VOLCANICS

2515 - 2520m	70	SILTSTONE: as above, moderately to very carbonaceous in parts.
	20	SANDSTONE: 1) loose quartz as above; 2) quartzose aggregates, as above, with 10% dull faint white fluorescence, which is predominantly mineral fluorescence, has very slow, very weak white diffuse cut. 3) quartz aggregates, as above.
	10	SHALE: as above, and very carbonaceous in parts.
	trace	PYRITE
2520 - 2525m	50	SILTSTONE: as above.
	40	SANDSTONE: 1) loose quartz as above 2) quartzose aggregates (medium grained) as above with 10% dull white fluorescence and slow weak streaming cut; 3) quartzose aggregates (very fine grained) as above, no shows.
	10	SHALE: as above.
2525 - 2530m	50	SANDSTONE: 1) loose quartz, predominantly loose quartz as above; 2) medium grained quartz aggregates as above with trace white to pale yellow mineral fluorescence. 3) very fine grained quartz aggregates as above.
	40	SILTSTONE: also medium dark grey, yellow grey, predominantly moderately hard, otherwise as above.
	10	SHALE: as above, fissile and very carbonaceous in parts.
	tr-5	CLAYSTONE: white to very light grey, also buff, very soft, blocky, well rounded cuttings, slightly sticky in part.
	trace	PYRITE
2530 - 2535m	60	SANDSTONE: 1) predominantly loose quartz as above, with grains ranging from angular to subrounded; 2) medium grained quartz aggregates as above, with medium grain size carbonaceous inclusions, trace dull white mineral fluorescence; 3) very fine grained quartz aggregates as above.
	30	SILTSTONE: as above.
	10	SHALE: as above.
	trace	PYRITE: as above.

2535 - 2540m	70	<p>SANDSTONE: 1) dominant type - loose quartz grains. Angular to subangular, translucent, medium to very coarse grained, moderately to well sorted;</p> <p>2) medium to coarse grained aggregates, translucent to white, moderately to very hard, well cemented with dolomite cement and quartz matrix. Medium grained with occasional coarse. Moderately to well sorted, subangular, poor visible porosity. Less than 5% pale dull yellow fluorescence (mineral fluorescence). Trace dull white fluorescence with very slow and weak streaming white cut;</p> <p>3) fine grained quartz aggregates, subrounded to rounded, friable, moderately sorted, poor to moderate visible porosity, translucent to light grey, no shows.</p> <p>SILTSTONE: very light grey to medium dark grey, blocky cuttings, moderately hard to friable.</p> <p>SHALE: fissile, brown to greyish black, carbonaceous, firm laminae generally.</p> <p>trace PYRITE: as above.</p> <p>trace CLAYSTONE: white to very light grey, very soft.</p>
2540 - 2545m	60	<p>SANDSTONE: 1) predominantly loose quartz fragments/grains - clear to translucent, medium to very coarse, predominantly coarse, angular to subrounded, predominantly subangular, moderately well sorted, no shows;</p> <p>2) quartzose aggregates - translucent, friable, medium to coarse grained, subrounded, moderately well sorted, dolomitic cement, well cemented, poor visual porosity, mineral fluorescence, rare to trace dull white fluorescence with slow weak streaming cut;</p> <p>3) quartzose aggregates - very light grey, friable, very fine grained, well sorted, dolomitic cement, poor to moderate visual porosity, no shows.</p> <p>SILTSTONE: very light grey to medium dark grey, yellow grey to pale brown, firm to moderately hard, blocky cuttings, carbonaceous flecking becoming more carbonaceous in parts, quartz grain inclusions in parts.</p> <p>SHALE: brown, firm, subfissile to fissile, carbonaceous.</p> <p>trace PYRITE: as above.</p>
2545 - 2550m	80	<p>SANDSTONE: 1) predominantly loose quartz fragments/grains - as above, no shows;</p> <p>2) minor quartzose aggregates - as above, with mineral fluorescence and a trace of patchy dull white fluorescence and very slow, weak white streaming cut;</p> <p>3) occasional quartzose aggregates as above, no shows.</p> <p>SILTSTONE: as above.</p> <p>trace SHALE</p> <p>trace PYRITE</p>

2550 - 2555m	50	SILTSTONE: also occasionally pale green, otherwise as above.
	30	SANDSTONE: 1) predominantly loose quartz as above, no shows; 2) quartzose aggregates as above, with mineral fluorescence and rare (less than a trace) weak, slow white streaming cut; 3) quartzose aggregates as above.
	10	SHALE: as above.
	10	CLAYSTONE: white to light grey, buff, very soft, sticky, common carbonaceous flecking.
2555 - 2560m	40	SANDSTONE: 1) loose quartz as above, and subrounded, no shows; 2) quartzose aggregates, with medium grain sized carbonaceous inclusions, otherwise as above. Rare white fluorescence with very weak, very slow diffuse white cut; 3) quartzose aggregates as above.
	30	SILTSTONE: as above.
	20	SHALE: brown, as above and becoming very carbonaceous.
	10	COAL: black, firm, angular cuttings, earthy to vitreous lustre.
2560 - 2565m	30	SILTSTONE: as above.
	30	SHALE: very carbonaceous, as above.
	30	SANDSTONE: 1) loose quartz as above; 2) quartzose aggregates as above, trace dull white fluorescence, with rare slow weak diffuse cut; 3) quartzose aggregates as above.
	10	COAL: as above.
2565 - 2570m	50	SILTSTONE: as above.
	40	SANDSTONE: 1) loose quartz as above; 2) quartzose aggregates as above, with trace of dull white fluorescence. 3) occasional quartzose aggregates as above.
	10	SHALE: as above.
	trace	CLAYSTONE
2570 - 2575m	trace	COAL
	70	SANDSTONE: 1) loose quartz as above; 2) common quartzose aggregates as above, no shows.
	20	SILTSTONE: as above.
2575 - 2580m	10	SHALE: carbonaceous, as above.
	80	SANDSTONE: 1) loose quartz fragments/grains, translucent, fine to very coarse grained, angular to subrounded, poorly sorted, no shows; 2) quartzose aggregates - clear to translucent, friable, medium grained, well sorted, dolomitic cement, poor visual porosity, no shows.
	10	SILTSTONE: as above.
	10	SHALE: as above.

2578m (Spot Sample)	90	SANDSTONE:  predominantly 1) loose quartz - as above.  Also quartzose aggregates 2) as above, with trace of dull white fluorescence and weak white instant crush cut (ie. no cut until crushed).
	10	SILTSTONE:  as above.
2580 - 2585m	80	SANDSTONE:  1) loose quartz grains/fragments as above, no shows; 2) quartzose aggregates - as above, 30% dull to moderately bright white fluorescence, moderately fast milky white streaming cut; 3) quartzose aggregates - as above, no shows.
	20	SILTSTONE:  as above.
	trace	SHALE:  very carbonaceous, otherwise as above.
2585 - 2590m	40	SANDSTONE:  1) loose quartz, as above, no shows; 2) quartzose aggregates, as above, with 40% bright cream fluorescence, and slow weak, diffuse white cut, pale white crush cut.
	30	SILTSTONE:  as above.
	20	CLAYSTONE:  as above.
	10	COAL/CARBONACEOUS SHALE:  as above.
2582m (Spot Sample)	60	COAL
	30	SANDSTONE:  quartz aggregates, type 2 as above, with trace dull patchy white fluorescence, 1 cutting had moderately fast streaming cut.
	10	CARBONACEOUS SHALE
2583m (Spot Sample)	40	COAL
	40	SANDSTONE:  1) loose quartz as above; 2) quartzose aggregates, as above, with a trace of very faint white fluorescence, no cut.
	20	SHALE:  very carbonaceous, as above.
2590 - 2595m	70	SANDSTONE:  1) loose quartz fragments, as above, no shows; 2) quartzose aggregates, as above, 30% cream fluorescence, with slow diffuse white cut and white crush cut.
	20	SILTSTONE:  as above.
	10	SHALE:  very carbonaceous, as above.
2597m (Bottoms Up)	70	SANDSTONE:  predominantly 1) loose quartz fragments/grains, as above, no shows; 2) quartzose aggregates, as above, with 30% moderately bright cream fluorescence, slow streaming to diffuse white cut, and instantaneous moderately strong white crush cut.
	20	SILTSTONE:  as above.
	10	CARBONACEOUS SHALE and COAL:  as above.

At 2597m POOH to cut Core No. 3  
Cut Core No. 3 from 2597-2602.1m

2602.1 - 2605m	50	SILTSTONE: light grey to medium dark grey, also pale brown and pale green grey, soft to firm, blocky cuttings, carbonaceous flecking and inclusions are common.
	30	SANDSTONE: 1) loose quartz, clear to translucent, medium to very coarse, angular to subangular, moderately well sorted, no shows; 2) dolomite cemented quartz aggregates - translucent to white, translucent quartz grains, moderately hard, medium to coarse grained, bimodal distribution, medium grained, well sorted and medium to coarse, moderately well sorted, well cemented, dolomitic cement, the medium to coarse grained aggregates have common carbonaceous inclusions, both have poor to very poor visual porosity, no shows; 3) quartzose aggregates - buff to pale brown, translucent quartz grains, friable, very fine to fine grained, subangular to subrounded, well sorted, silica and dolomite cement, carbonaceous inclusions, poor to moderate visual porosity, 10% dull to bright white fluorescence with moderately fast streaming white cut and instantaneous white crush cut.
	10	COAL: black, moderately hard, brittle, angular cuttings, vitreous. Note: spot sample at 2605m showed approximately 50% coal.
	10	SHALE: brown, firm, subfissile to fissile, carbonaceous.
2605 - 2610m	40	SILTSTONE: as above.
	30	SANDSTONE: 1) loose quartz - as above, no shows; 2) dolomite cemented quartz aggregates as above, with dull to moderately bright white fluorescence, weak white streaming to dispersive cut and weak white crush cut; 3) quartz aggregates - as above, with pale yellow fluorescence, moderate dispersive white cut and instantaneous white crush cut. Sandstone types 2) and 3) have 20% moderately bright pale yellow/white fluorescence.
	20	SHALE: as above.
	10	COAL: as above.
2610 - 2616.7m	40	SILTSTONE: as above.
	30	SANDSTONE: 1) loose quartz as above; 2) dolomitic cemented aggregates - as above, with fluorescence and cut as above; 3) quartz aggregates as above, with fluorescence and cut as above, with cut ranging to moderately fast streaming white cut. Sandstones type 2) and 3) have 20% fluorescence as above.
	10	COAL: as above.
	10	SHALE: as above.
	10	CLAYSTONE: very light grey to light grey, buff, very soft, carbonaceous flecking.

Core No. 4 2616.7 - 2635.2m

Core No. 5 2635.2 - 2653.0m

Core No. 6 2653.0 - 2671.2m

Core No. 7 2672.0 - 2690.5m

Core No. 8 2690.5 - 2708.3m

2708.3 - 2710m	60	SANDSTONE: dominantly fine to medium aggregates. Moderately well sorted to well sorted, subangular to subrounded, slightly to very carbonaceous, pyritic, common light brown oil staining. Moderately hard, minor loose medium to coarse grained quartz. Poor visual porosity. 35% moderately bright yellow fluorescence (sandstone aggregates), fast moderately strong bright white stream cut, weak crush cut, light brown oil residue. Moderately strong petroliferous odour.
	40	SILTSTONE: medium light grey to dark grey, hard, micaceous (muscovite) slightly carbonaceous.
	trace	COAL: black, hard, brittle and blocky to earthy.
2710 - 2715m	50	SANDSTONE: dominantly sandstone aggregates as above, 35% hydrocarbon fluorescence as above.
	50	SILTSTONE: as above.
	trace	COAL
2715 - 2720m	50	SANDSTONE: as above, 10% fluorescence as above.
	50	SILTSTONE: as above.
	trace	COAL
2720 - 2725m	60	SILTSTONE: light grey to dark grey, hard, sandy in part, carbonaceous, micaceous.
	40	SANDSTONE: fine to medium grained, subangular to subrounded, moderately well sorted, commonly oil stained, occasionally carbonaceous, occasionally pyritic. Rare loose medium to coarse grains. Aggregates have silica cement, poor porosity. 30% moderately bright yellow fluorescence (sandstone aggregates), moderately fast bright white streaming cut, moderately bright white crush cut.
	trace	COAL: black, hard, conchoidal fracture.
2725 - 2730m	70	SANDSTONE: as above, 40% hydrocarbon fluorescence as above.
	30	SILTSTONE: as above.
2730 - 2735m	60	SANDSTONE: 80% aggregates as above, 20% loose medium to coarse grained, subangular to subrounded quartz grains, 40% hydrocarbon fluorescence as above.
	40	SILTSTONE: as above.
	trace	COAL Note: Light film of light brown oil in mud, fluorescence is moderately bright yellow.
2735 - 2740m	70	SANDSTONE: as above, 50% moderately bright yellow hydrocarbon fluorescence, as above.
	30	SILTSTONE: as above.
	trace	COAL

2740 - 2745m	50	SANDSTONE: fine to medium grained aggregates are dominant. Grains are subangular to subrounded, moderately well sorted, cemented with weak to moderately strong silica and rare pyrite cements. Common oil staining, aggregates are friable to moderately hard, with very poor visual porosity. 30% of sandstone is loose, medium to coarse grained, subrounded quartz grains. <u>Shows:</u> 30% moderately bright yellow fluorescence (sandstone aggregates), weak to moderately fast, strong bright white streaming cut. Fast, strong bright white crush cut. Slight petroliferous odour.
	50	SILTSTONE: light to dark grey, hard, micaceous, carbonaceous.
	trace	COAL: black, earthy to brittle, conchoidal fracture on harder pieces.
2745 - 2750m	70	SILTSTONE: as above.
	30	SANDSTONE: as above, 20% hydrocarbon fluorescence as above.
	trace	COAL
2750 - 2755m	50	SILTSTONE: as above.
	50	SANDSTONE: as above, 40% of sand is loose medium to coarse grained quartz. 30% hydrocarbon fluorescence as above.
	trace	COAL
2755 - 2760m	60	SANDSTONE: as above, 50% of sand is loose, as above; 50% is aggregates as above. 30% hydrocarbon fluorescence as above.
	40	SILTSTONE: as above.
	trace	COAL
2760 - 2765m	60	SANDSTONE: as above, crush cut, weak to moderate; 30% hydrocarbon fluorescence.
	40	SILTSTONE: as above.
	trace	COAL
2765 - 2770m	60	SANDSTONE: as above, 30% hydrocarbon fluorescence.
	40	SILTSTONE: as above.
	trace	COAL
2770 - 2775m	50	SANDSTONE: predominantly medium grained aggregates, some loose grains, poor to moderate porosity, some pyritic cement. 30% fluorescence, weak cut, moderate crush cut.
	40	SILTSTONE: dark brown to dark grey, hard.
	10	COAL: as above.
2775 - 2780m	50	SANDSTONE: predominantly medium to fine sandstone with some loose coarse quartz grains, some dolomitic and pyrite cement. 10% fluorescence, blue to white, predominantly mineral.
	50	SILTSTONE: grey to dark brown, hard, carbonaceous in part.
	trace	COAL
	trace	DOLOMITE: as cement.
	trace	PYRITE: as cement, or discrete lumps.



2780 - 2785m	50	SANDSTONE: as above, 5% blue white fluorescence, some mineral, some hydrocarbon. Very weak cut, moderate crush cut.
	50	SILTSTONE: as above.
	trace	COAL
	trace	DOLOMITE
	trace	PYRITE
2785 - 2790m	70	SANDSTONE: as above. 20% blue white hydrocarbon fluorescence, moderate cut, good crush cut, milky white.
	30	SILTSTONE: as above.
2790 - 2795m	70	SANDSTONE: as above. 30% bright blue white fluorescence, predominantly hydrocarbon. Very weak cut, moderate crush cut - milky white.
	30	SILTSTONE: as above.
	trace	PYRITE: increasing amount.
2795 - 2800m	70	SANDSTONE: medium to fine grained, white to brown to grey, some subangular coarse quartz grains, some dolomitic cement. 10% blue white hydrocarbon fluorescence, moderate cut, good crush cut, chalky white. 20% mineral fluorescence (dolomite).
	30	SILTSTONE: brown, grey to dark grey, medium hard, some carbonaceous content.
	trace	COAL
	trace	PYRITE
2800 - 2806.8m	80	SANDSTONE: as above, 20% fluorescence, in part hydrocarbon; bright blue white fluorescence, weak cut, moderate crush cut, in part mineral (dolomite).
	20	SILTSTONE: as above.
	trace	COAL
	trace	PYRITE
		Core No. 9 2806.8 - 2814.0m
2814 - 2815m	80	SANDSTONE: in part a cemented coarse quartz sandstone and in part loose angular coarse quartz grains. 30% bright blue white fluorescence, with moderate crush cut.
	20	SILTSTONE: as above.
	trace	PYRITE: as coarse discrete lumps, amount increasing.
2815 - 2820m	90	SANDSTONE: predominantly coarse to medium quartz grains, subangular to subrounded, very poorly sorted, fine grains are cemented together. 35% bright blue white fluorescence, moderate cut, good crush cut.
	10	SILTSTONE: as above.
	trace	PYRITE
2820 - 2825m	90	SANDSTONE: as above, 20% fluorescence, no cut, moderate crush cut.
	10	SILTSTONE: as above.
	trace	PYRITE

2825 - 2830m	90	SANDSTONE: 50% quartz, both coarse grains as above, and cemented finer grains with 50% dark brown, grey, fine hard sandstone. 20% fluorescence, no cut, moderate crush cut.
	10	SILTSTONE: as above.
	trace	PYRITE
2830 - 2835m	80	SANDSTONE: as above, 25% fluorescence, weak cut, moderate crush cut.
	20	SILTSTONE: as above.
	trace	PYRITE
2835 - 2840m	80	SANDSTONE: as above, 20% fluorescence, very weak cut, weak crush cut.
	20	SILTSTONE: as above.
	trace	PYRITE
2840 - 2845m	80	SANDSTONE: as above, 20% fluorescence, very weak cut, weak blue white crush cut.
	20	SILTSTONE: as above.
	trace	PYRITE
	trace	COAL
2845 - 2850m	70	SANDSTONE: as above.
	30	SILTSTONE: as above.
	trace	COAL
	trace	PYRITE
2850 - 2855m	80	SANDSTONE: in part a silica cement coarse quartz sandstone, in part angular, very coarse, loose quartz grains. 20% blue white fluorescence with weak blue white crush cut.
	20	SILTSTONE: as above.
2855 - 2860m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
2860 - 2865m	100	SANDSTONE: as above.
	trace	SILTSTONE
	trace	PYRITE
2865 - 2870m	100	SANDSTONE: as above.
	trace	SILTSTONE
2870 - 2875m	100	SANDSTONE: as above, with 10% blue white fluorescence, weak cut, moderate crush cut (milky white).
	trace	SILTSTONE
	trace	PYRITE
2875 - 2880m	100	SANDSTONE: as above, 5-10% blue white fluorescence, weak crush cut.
	trace	SILTSTONE
	trace	PYRITE
	trace	DOLOMITE: mineral fluorescence.
2880 - 2885m	100	SANDSTONE: as above, 5% blue white fluorescence, very weak cut, weak crush cut.
	trace	SILTSTONE
	trace	PYRITE

2885 - 2890m	100	SANDSTONE: as above, 10% blue white fluorescence, no cut, moderate to strong crush cut (milky white). SILTSTONE PYRITE
	trace	
	trace	
2890 - 2895m	100	SANDSTONE: as above, a coarse fraction indicates pebble nature suggesting some sand sized particles (coarse) arising from a conglomerate - very angular particles. 10% blue/white fluorescence - moderate crush cut. PYRITE
	trace	
2895 - 2900m	100	SANDSTONE: as above, fine to medium quartz grains, siliceous cement in part. Coarse subangular quartz grains, minor brown/grey sandstone - fine grained, well rounded, well sorted. Note: coarse fraction indicative of conglomerate with quartz, sandstone and siltstone possible. 15% blue/white fluorescence including some of large quartz aggregates from conglomeratic pebbles. Minor cut - good crush cut from some grains. SILTSTONE: light cream/brown in colour. PYRITE
	trace	
	trace	
2900 - 2905m	95	SANDSTONE: as above, with similar conglomerate fragments, 5% blue white fluorescence - weak crush cut.
	5	SILTSTONE: light brown, cream, black, often hard.
	trace	PYRITE
2905 - 2910m	95	SANDSTONE: as above, 10-15% blue/yellow fluorescence, weak cut, moderate crush cut.
	5	SILTSTONE: as above.
	trace	PYRITE Note: presence of conglomeratic pebbles indicated.
2910 - 2915m	90	SANDSTONE: as above, 5% green/blue/yellow fluorescence, weak cut, moderate crush cut. As above, the presence of conglomerates is indicated.
	10	SILTSTONE: as above, with black siltstones, possibly carbonaceous?
	trace	PYRITE
2915 - 2920m	100	SANDSTONE: as above, approximately 2-5% yellow/blue fluorescence, weak to moderate cut, moderate crush cut. Conglomerate fragments (as above) are present.
	trace	SILTSTONE
	trace	PYRITE
2920 - 2925m	95	SANDSTONE: as above, 5% green/blue fluorescence, weak to moderate crush cut, conglomerate fragments in coarse fraction.
	5	SILTSTONE: as above.
	trace	PYRITE

2925 - 2930m	95	SANDSTONE: as above, 5% green/blue fluorescence, moderate cut, good crush cut. Conglomerate fragments in coarse fraction.
	5	SILTSTONE: as above.
	trace	PYRITE
	trace	DOLOMITE?
2930 - 2935m	95	SANDSTONE: as above, 5% fluorescence, white to yellow in colour, weak to moderate cut, good crush cut (milky white).
	5	SILTSTONE: as above.
		Note: evidence of conglomerate pebbles is found in the coarse fraction.
2935 - 2940m	90	SANDSTONE: as above, 10% white/yellow fluorescence, moderate crush cut. Coarse fraction containing conglomerate fragments.
	10	SILTSTONE: as above.
2940 - 2945m	95	SANDSTONE: fine to medium, subrounded quartz grains, generally singular, some cementation present, minor brown/grey sandstone present. Some coarser, angular quartz grains, indicative of conglomerate fragments - 10% blue/white fluorescence. Weak cut and crush cut.
	5	SILTSTONE: light brown, cream and black, occasionally hard.
	trace	PYRITE
2945 - 2950m	95	SANDSTONE: as above, 10-15% fluorescence (white/yellow), weak cut.
	5	SILTSTONE: as above.
2950 - 2955m	100	SANDSTONE: as above, minor evidence of conglomerate fragments, 20% white/yellow fluorescence, weak cut, moderate milky/white crush cut.
	trace	SILTSTONE
	trace	PYRITE
2955 - 2960m	100	SANDSTONE: as above, conglomerate fragments present as above. 10% white/yellow fluorescence, very weak/weak crush cut.
	trace	SILTSTONE
	trace	PYRITE
		Ran logs, set 9-5/8" casing at 2943m
2960 - 2965m	100	SANDSTONE: loose quartz grains, fine to dominantly coarse, common very coarse fractured grains from conglomerate; occasional fine grained aggregates.
	common	CEMENT
	common	CAVINGS (volcanics, limestone, coal).

2965 - 2970m	90	<p>SANDSTONE: dominantly loose quartz grains, clear to milky to grey, fine to dominantly coarse, occasionally very coarse, subangular to angular, moderately sorted, very coarse grains are commonly milky and grey, angular to very angular with fractured appearance - from larger conglomeratic quartz. Grey grains have a recrystallised appearance with silt and pyrite inclusions - probably quartzite grains; common moderately to well cemented aggregates, fine to medium grained, subangular, moderately sorted, minor dark lithic (silt) grains, poor visible porosity. 20% moderately bright cream white fluorescence with slow streaming to blooming milky white cut. Some fluorescence is possibly dolomite mineral fluorescence.</p>
	10	<p>COAL: black, angular, vitreous.</p>
2970 - 2975m	100	<p>SANDSTONE: clear to milky, and grey as above; common aggregates as above, 10% cream white fluorescence and milky white cut.</p>
2975 - 2980m	100	<p>SANDSTONE: loose grains as above, dominantly coarse, common very coarse milky and grey quartz grains from conglomerate; common aggregates as above, some fine to medium, moderately cemented, some fine grained, extremely well cemented (siliceous cement), silty, pyritic - have appearance of lithic grains, 10% fluorescence and cut as above.</p>
	trace trace	<p>PYRITE CAVINGS: silt, shale.</p>
2980 - 2985m	100	<p>SANDSTONE: as above, some dark grey silty lithic grains visible in aggregates, occasional quartz veins visible in very coarse grains. Fine to medium grained aggregates as above with 15% fluorescence and slow cut as above, (some fluorescence possibly dolomite mineral fluorescence). Also trace of orange gold mineral fluorescence.</p>
2985 - 2990m	100	<p>SANDSTONE: quartzose aggregates, hard, moderately cemented, fine to medium grained, subangular, moderately sorted, occasional pyrite cement, siliceous cement, possible dolomite cement, occasional grey lithic grains (siltstone, quartzite), poor visible porosity. 20% cream white fluorescence (some possibly dolomite) with slow diffuse milky white cut (weak); Loose coarse to very coarse grains, angular to very angular, milky to grey, quartzose, commonly have crystalline appearance with silt inclusions, appear to be quartzite fragments (from conglomerate).</p>

2990 - 2995m	80	SANDSTONE/CONGLOMERATE: quartzose aggregates as above, with 10% fluorescence and cut as above; very coarse angular quartz and quartzitic grains as above.
	20	SILTSTONE: brown grey, blocky, firm, argillaceous, slightly microcarbonaceous, slightly micromicaceous, slightly sandy in part, slightly speckled appearance.
2995 - 3000m	100	SANDSTONE/CONGLOMERATE: aggregates as above, slightly more common, 10% fluorescence as above, some cut; quartzitic grains as above.
	trace	SILTSTONE
3000 - 3005m	100	SANDSTONE/CONGLOMERATE: dominantly milky to grey quartzitic fragments from conglomerate pebbles as above; aggregates as above, slightly silty in part (10% fluorescence).
	trace	SILTSTONE
	trace	WHITE CLAYEY GRAINS
3005 - 3010m	100	SANDSTONE/CONGLOMERATE: coarse to very coarse quartzitic fragments as above; quartzose aggregates as above. Also very fine to fine quartzose aggregates with white clay matrix. 10% fluorescence with weak cut as above.
	trace	SILTSTONE
	trace	PYRITE
	trace	CLAYSTONE
3010 - 3015m	100	SANDSTONE/CONGLOMERATE: coarse to very coarse fragments as above. Some coarse quartz grains, subangular to subrounded; quartzose aggregates as above, 10% fluorescence as above, some weak cut.
3015 - 3020m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above; quartzose aggregates as above. 20% fluorescence with weak cut as above.
	trace	SILTSTONE
3020 - 3025m	100	SANDSTONE/CONGLOMERATE: as above. 20% dull (occasionally bright) cream white fluorescence with slow milky white cut.
	trace	SILTSTONE
3025 - 3030m	90	SANDSTONE/CONGLOMERATE: quartzitic fragments as above; quartzose aggregates as above, also very fine to fine aggregates, well cemented, siliceous cement, minor pyrite cement, 20% fluorescence (some probably mineral fluorescence) with some weak cut.
	10	SILTSTONE: as previously described.
3030 - 3035m	100	SANDSTONE/CONGLOMERATE: as above, 30% dull fluorescence and slow cut as above.
	trace	SILTSTONE

- 55 -

3035 - 3040m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above; aggregates as above, also common loose quartz grains, dominantly fine to medium, clear to frosted, subangular to subrounded. 30% dull cream white fluorescence with slow blooming to diffuse milky white cut.
3040 - 3045m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above. Occasionally show rounded surfaces; quartzose aggregates as above. Also loose quartz grains as above. 30% fluorescence and cut as above.
3045 - 3050m	100	SANDSTONE/CONGLOMERATE: frosted to light grey quartzitic fragments, also dark grey silty quartzitic fragments, angular to very angular, some have uniform cherty texture, other fragments have a recrystallised texture with silt and pyrite inclusions; quartzose aggregate as above. Also loose quartz grains, dominantly fine as above. 20% fluorescence (some possibly mineral) with weak cut as above.
3050 - 3055m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above, more common; fine to medium aggregates as above. Also very fine to fine grained aggregates, well cemented as above. Minor loose grains. 30% fluorescence and weak cut as above.
	trace	SILTSTONE
3055 - 3060m	100	SANDSTONE/CONGLOMERATE: very angular quartzitic and cherty fragments as above, rare red brown jasper fragments; aggregates as above, also loose fine to coarse grains. 20% fluorescence (some possibly mineral) and weak cut.
3060 - 3065m	100	SANDSTONE/CONGLOMERATE: milky, light grey, dark grey quartzitic grains as above, silty and pyritic in part; quartzose aggregates, fine (dominantly) to medium grained, angular to subangular, moderately to well sorted, light grey to light brown, minor white to light brown clay matrix, occasional lithic (grey quartzite) grains, occasional pyrite cement, moderately cemented - siliceous cement, rarely slightly silty and carbonaceous, poor visible porosity; also minor grey quartzose aggregates, very fine to fine grained, subangular, poorly sorted, hard, well cemented, common silt and pyrite matrix, very poor visible porosity. 20% fluorescence (some mineral?), dull cream white, with slow blooming to diffuse milky white cut and crush cut (weak show).
	trace	SILTSTONE
	trace	CLAYSTONE

3065 - 3070m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above, pyritic silt grains visible within fused quartz fragments; fine to medium and very fine to fine aggregates as above. 20% fluorescence with some cut.
	trace	SILTSTONE
	trace	CLAYSTONE
3070 - 3075m	100	SANDSTONE/CONGLOMERATE: quartzitic fragments as above; aggregates as above. 10% fluorescence as above, with weak cut as above.
3075 - 3080m	100	SANDSTONE/CONGLOMERATE: quartzitic and lithic fragments as above, occasional black, very hard, microcrystalline (basalt) fragments; aggregates as above, loose grains less common than above. 20% fluorescence and cut as above, from aggregates.
3080 - 3085m	100	SANDSTONE/CONGLOMERATE: very coarse, angular to very angular quartzitic and lithic fragments; common fine to medium aggregates as above, more common than above, minor very fine to fine aggregates, 30% fluorescence and weak cut.
	trace	SILTSTONE
	trace	CLAYSTONE
3085 - 3090m	70	SILTSTONE: light to dark brown grey, firm to hard, blocky, argillaceous, carbonaceous, slightly speckled, very pyritic in part, quartzose.
	30	SANDSTONE/CONGLOMERATE: as above, 10% fluorescence and cut.
3090 - 3095m	80	ALTERED VOLCANICS: multicoloured (medium grey, blue grey, green grey, occasionally green, brown grey), blocky, angular to very angular, very hard, abundant clayey alteration, slightly pyritic, microcrystalline texture with occasional crystals visible.
	10	SILTSTONE: as above.
	10	SANDSTONE/CONGLOMERATE: as above, 10% fluorescence and cut.
3095 - 3100m	90	ALTERED VOLCANICS: multicoloured as above, but dominantly medium grey to brown grey, very clayey, extremely hard and angular, some cuttings are silty and contain quartz grains, - appears to be a silicified siltstone with volcanic content.
	10	SANDSTONE/CONGLOMERATE: as above.
3100 - 3105m	100	VOLCANICS: dominantly medium to brown grey, abundant clay alteration, silty texture in part.
	trace	SILTSTONE
	trace	SANDSTONE



3105 - 3110m	50	VOLCANICS: medium to brown grey as above, silty in part.
	30	SILTSTONE: dark brown grey, firm to hard, blocky, quartzose, argillaceous, carbonaceous, sandy in part, grading to fine grained sandstone, slightly speckled.
	20	SANDSTONE: fine grained aggregates, slightly argillaceous, slightly carbonaceous, poor visible porosity. 20% dull cream fluorescence with slow streaming to blooming cream white cut.
	trace trace	COAL CONGLOMERATE
3110 - 3115m	80	SANDSTONE: quartzose aggregates, light brown, dominantly fine to medium grained, subangular to dominantly subrounded, poorly sorted, moderately hard, moderately cemented, siliceous cement, minor argillaceous matrix, slightly silty in part, slightly carbonaceous in part, poor visible porosity. 70% dull cream fluorescence with very slow diffuse (occasional blooming) milky white cut and strong crush cut.
	10	SILTSTONE: as above.
	10	CONGLOMERATE: very coarse, angular, frosted quartz grains.
3115 - 3116m (Bottoms Up)	70	SANDSTONE: fine to medium grained aggregates as above, occasionally coarse. 60% fluorescence and crush cut as above.
	20	SILTSTONE: dark brown grey, argillaceous, carbonaceous, as above.
	10	COAL: black, hard, angular, vitreous.
POOH to cut Core No. 10 3116.1 - 3117.5m		
3117.5 - 3120m	90	SANDSTONE: dominantly fine grained aggregates as above, - slightly silty, slightly argillaceous, very poor visible porosity. Also loose grains very fine to medium, very coarse, very angular frosted quartz grains, some recrystallised quartzitic grains. 60% dull cream fluorescence with slow blooming to diffuse milky white cut.
	10	SILTSTONE: brown grey as above.
	trace	COAL
3120 - 3125m	90	SANDSTONE: dominantly loose clear quartz grains, fine to dominantly medium (occasionally coarse to very coarse), subangular, poorly sorted, minor medium grained aggregates, clean quartz sand, not argillaceous as above. 70% dull cream yellow fluorescence with slow streaming to blooming milky white cut and crush cut. Poor visible porosity.
	10	SILTSTONE: as above.
	common	COAL
3128m (Spot Sample)	90	SILTSTONE: as above.
	10	SANDSTONE: as above.

3125 - 3130m	80	SANDSTONE: light brown quartzose aggregates, moderately hard to moderately friable, very fine to dominantly fine grained, occasionally medium and coarse, subangular to subrounded, moderately to poorly sorted, white to light brown clay matrix, slightly carbonaceous in part, moderately siliceous cemented, poor visible porosity. 50% dull cream fluorescence with slow blooming to diffuse milky white cut and moderately strong crush cut; also have quartz grains, fine to dominantly medium, also very coarse grains, angular, broken.
	10	SILTSTONE: brown grey, very hard, argillaceous, slightly carbonaceous.
	10	CLAYSTONE: white to light brown, soft, sandy grading to sandstone with abundant clay matrix.
3130 - 3135m	70	SANDSTONE: mostly aggregates with clay matrix as above. Minor loose grains, fine to medium. Also very coarse, angular quartz grains indicating granules in sandstone. 40% fluorescence and cut as above.
	20	SILTSTONE: dark brown grey, argillaceous, carbonaceous, firm; brown grey, very hard, recrystallised texture.
	10	CLAYSTONE: sandy as above.
3135 - 3140m	90	SANDSTONE: aggregates as above. Common coarse to very coarse angular quartz fragments from granules, includes grey quartzite fragments.
	10	SILTSTONE: as above.
	trace trace	COAL CLAYSTONE
3140 - 3143m (Bottoms Up)	90	SANDSTONE: dominantly loose quartz grains, fine to very coarse, dominantly medium, subangular to very angular, poorly sorted, occasionally quartzitic fragments. 60% fluorescence and slow streaming to blooming cut as above. Minor fine to medium grained aggregates.
	10	SILTSTONE: as above.
	trace	COAL
3143 - 3150m		POOH to cut Core No. 11 3143.4 - 3145.4
	100	SANDSTONE/CONGLOMERATE: quartzose aggregates, fine to medium, well cemented, minor clay matrix in part, minor loose grains fine to coarse; loose, angular, very coarse fragments, fractured, quartz and light to dark grey quartzitic grains, from pebbles. 50% dull cream yellow fluorescence with slow streaming to blooming cut.
	trace trace	COAL SILTSTONE
3150 - 3155m	100	SANDSTONE/CONGLOMERATE: dominantly quartzose aggregates as above; minor quartzitic fragments, 60% fluorescence and cut as above.

3155 - 3160m	90	SANDSTONE/CONGLOMERATE: aggregates as above, common quartz and quartzitic fragments, as above; 50% fluorescence and cut as above.
	10	SILTSTONE: dark brown grey, hard, blocky, argillaceous, micromicaceous.
	trace	COAL
3160 - 3165m	80	SANDSTONE/CONGLOMERATE: aggregates as above, also loose fine to medium quartz grains; milky quartz and light to dark grey quartzitic fragments, very angular. 40% fluorescence and cut.
	20	SILTSTONE: as above.
	trace	COAL
3165 - 3170m	100	SANDSTONE/CONGLOMERATE: minor aggregates; dominantly quartz and quartzite fragments from conglomerate. 40% dull cream yellow fluorescence with very slow diffuse white cut and poor crush cut.
3170 - 3175m	100	SANDSTONE/CONGLOMERATE: dominantly very coarse conglomeratic fragments; minor aggregates. 30% fluorescence and cut.
	trace	SILTSTONE
	trace	COAL
3175 - 3180m	100	SANDSTONE/CONGLOMERATE: dominantly quartz and quartzite fragments as above; fine to medium grained aggregates as above. Also minor very fine to fine grained aggregates. 20% fluorescence with very slow weak cut.
3180 - 3185m	90	SANDSTONE/CONGLOMERATE: light brown to light grey quartzose aggregates, hard, dominantly fine to medium grained, occasionally coarse, subangular to subrounded, moderately to poorly sorted, well cemented - siliceous, occasional lithic (quartzite) grains, minor clay in part, slightly carbonaceous and silty in part, very poor visible porosity. Also very light grey quartzose aggregates, dominantly very fine to fine, subrounded, well sorted, hard, very well cemented with siliceous cement giving semi-recrystallised texture, no visible porosity;
		coarse to very coarse angular fragments, milky quartz and grey quartzite, fractured texture. 20% cream fluorescence (mineral fluorescence from conglomerate fragments) with very slow diffuse milky white cut.
	10	SILTSTONE: medium grey to brown grey, firm to hard, argillaceous, slightly carbonaceous, clayey in part, sandy in part.
3185 - 3190m	100	SANDSTONE/CONGLOMERATE: very fine to fine and fine to medium aggregates as above; fragments as above. 10% fluorescence and weak cut as above.

- 60 -

3190 - 3195m	100	SANDSTONE/CONGLOMERATE: aggregates as above; dominantly conglomerate fragments as above. 10% fluorescence and cut.
	trace	SILTSTONE
3195 - 3200m	100	SANDSTONE/CONGLOMERATE: common very fine to fine grained aggregates, also fine to medium grained aggregates. Minor loose grains; common conglomerate fragments. 20% fluorescence and weak cut as above.
3200 - 3202m (Bottoms Up)	100	SANDSTONE/CONGLOMERATE: as above, aggregates and fragments. 10% fluorescence and cut.
3202 - 3205m	100	SANDSTONE/CONGLOMERATE: aggregates as above; conglomerate fragments as above, 20% fluorescence and cut.
	trace	CAVINGS
3205 - 3210m	100	SANDSTONE/CONGLOMERATE: coarse to very coarse fractured fragments; angular to very angular, fragments are recrystallised (milky) quartz with occasional original grain boundaries visible and recrystallised quartzite grey with inclusions commonly visible, extremely hard and abrasive. Trace of orange gold fluorescence - mineral; brown grey quartzose aggregates, dominantly fine to medium, subangular, moderately sorted, hard, slightly carbonaceous in part, slightly silty in part, well cemented - siliceous, poor visible porosity. Also light grey quartzose aggregates, very fine to fine grained, subangular, moderately sorted, very well cemented - siliceous. 10% dull cream fluorescence with very slow blooming to diffuse milky white cut and moderate crush cut.
3210 - 3215m	100	SANDSTONE/CONGLOMERATE: minor conglomerate fragments; dominantly aggregates, dominantly fine to medium grained, occasionally coarse, subangular to subrounded, moderately sorted, moderately hard, moderately cemented. (Minor clay matrix, slightly carbonaceous in part). Also common loose quartz grains from disaggregated aggregates. 60% dull cream fluorescence with very slow diffuse milky white cut (weak show).
3215 - 3220m	80	SANDSTONE: dominantly fine grained aggregates as above, moderately friable to moderately hard, common clay matrix grading to sandy claystone, slightly silty, slightly carbonaceous (ie. dirty). 20% fluorescence and very slow weak cut as above; occasional conglomerate fragments.
	20	CLAYSTONE: white to light brown, soft, sandy.
	trace	SILTSTONE

3223.5m (Spot Sample)	40 40 20	COAL SILTSTONE SANDSTONE and CONGLOMERATE
3220 - 3226m (Bottoms Up)	80  20  trace trace	SILTSTONE: brown grey to very dark grey, firm to very hard, blocky to very thinly laminated, dark grey cuttings are very carbonaceous, brown grey cuttings are clayey and slightly sandy, slightly carbonaceous. SANDSTONE/CONGLOMERATE: as above, 10% fluorescence and cut as above. COAL CLAYSTONE
3226 - 3230m	50  30  20	SILTSTONE: dark grey to brown grey, very hard, argillaceous, carbonaceous, slightly sandy, silica cement, angular cuttings. COAL: dark grey to black, angular, dull earthy texture, slightly silty. SANDSTONE: fine to medium grained aggregates with silt and clay matrix, slightly carbonaceous, well cemented, minor lithic grains. Trace of conglomerate fragments. 10% faint fluorescence with very slow diffuse cut and weak crush cut. No visible porosity.
3230 - 3235m	70       20  10	SANDSTONE: speckled to mottled light brown grey, firm to hard, dominantly fine to medium, subangular to dominantly subrounded, well sorted, sandstone is composed of clear quartz grains, grey lithic (quartzite) grains, dark brown lithic grains, black carbonaceous grains set in white to light brown, occasionally greenish clay matrix (abundant), moderately cemented, granular texture, becomes very clayey in part. Has faint spotty cream yellow fluorescence, only trace of very slow streaming to blooming cut (from 2 or 3 grains out of each cutting), fluorescence appears to be mostly mineral fluorescence. 40% of sample has fluorescence. SILTSTONE: medium grey to brown grey, hard to very hard, angular, argillaceous grading to shale in part, slightly carbonaceous, very lithified. COAL: as above.
3235 - 3237.6m (Bottoms Up)	90    10 trace trace	SILTSTONE: medium grey, extremely hard, angular to very angular, very argillaceous becoming shaley in part; slightly microcarbonaceous. Trace of dark brown grey carbonaceous siltstone, very hard, as above. SANDSTONE: speckled as above. COAL CLAYSTONE (soft).
3237.6-3240m	90	SILTSTONE: medium grey, angular to subangular, occasionally subfissile, slightly sandy in part, slightly carbonaceous and very argillaceous, very hard.

	10	SANDSTONE: fine grained, subangular, mottled, very poorly sorted, containing clear quartz, light grey quartzite (lithic) carbonaceous grains and laminae, slightly argillaceous with strong silica cement. Cuttings are very hard. Common light brown oil staining of otherwise white sucrosic silica cement. No visual porosity. 40% dull yellow/green fluorescence from sandstone and sandy siltstone cuttings. Very slow, weak dull diffuse streaming cut - yellow/green. Weak dull yellow/green crush cut.
3240 - 3245m	90	SILTSTONE: medium light grey to medium dark grey, occasionally speckled, angular, very hard cuttings. Slightly carbonaceous, slightly micromicaceous. Rare, light orange, clean siltstone cuttings.
	10	SANDSTONE: very light grey to red brown, mottled and speckled, occasionally plain, fine to very fine grained, grading to coarse siltstone. Contains subangular quartz, quartzite (lithic) and carbonaceous grains as well as abundant parallel carbonaceous laminae. Rare (in matrix) light brown staining some of which may be oil, some possibly Fe-oxide or argillaceous material. Several loose, coarse grained, subrounded quartz grains (probably cavings). Aggregates have very strong silica cement. No visual porosity. 15% dull to very dull yellow fluorescence from sandstone cuttings and some sandy siltstone cuttings. Very slow, weak, diffuse dull yellow streaming cut, weak dull yellow crush cut. Poor show. Trace moderately bright yellow fluorescence from white sucrosic mineral coating some siltstone cuttings. Very slightly reactive in HCl, probably dolomite.
3245 - 3250m	60	SILTSTONE: as above.
	40	SANDSTONE: very fine grained to occasionally fine grained. Grades downwards to siltstone. Mottled and speckled as above. 40% very dull yellow fluorescence from sandstone cuttings. Very slow dull yellow streaming cut from several grains (approximately 20% of fluorescent grains give cut). Probably mineral fluorescence (Calcimetry = 0% dolomite, 0% calcite) Could be just very tightly locked away hydrocarbons.
3250 - 3255m	80	SANDSTONE: fine to dominantly very fine grained, mottled and oil stained as above.
	20	SILTSTONE: as above. 60% dull to occasionally moderately bright yellow/green fluorescence from sandstone cuttings. Very weak to no streaming cut. Slow, very dull yellow crush cut.

3255 - 3257m  
T.D.

85

SANDSTONE: very light grey to red brown, mottled, speckled and plain. Fine to dominantly very fine grained, subangular to subrounded. Contains clear quartz grains, light grey lithic quartzite grains, black carbonaceous grains and laminae. Hard, clear to sucrosic silica cement with common light brown oil staining. No visual porosity.

15

SILTSTONE: medium light grey to medium dark grey. Occasionally speckled, hard, angular cuttings. Slightly carbonaceous, slightly micromicaceous in part.

60% spotty very dull yellow fluorescence from sandstone cuttings. Very slow to no streaming cut (dull yellow/green). Slow, weak, dull yellow/green crush cut.

15011/1-63

APPENDIX 2

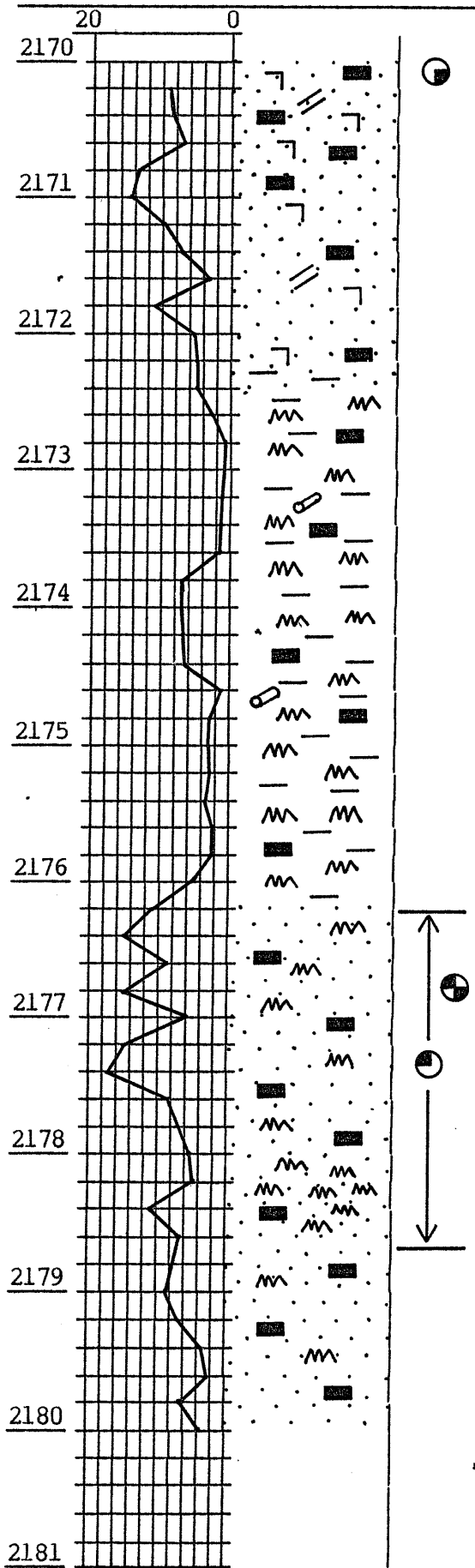
APPENDIX 2



APPENDIX - 2  
CORE DESCRIPTIONS

Core No. 1 Well : Wirrah 3  
 Interval Cored : 2170.00-2188.00m  
 Cut : 18.00m Recovered : 17.90m (99%)  
 Bit Type : Christ RC-4 Bit Size : 8-1/2 ins.  
 Described by : M. Fittall Date : 7/12/83

Depth & Int. ROP Graphic Shows Descriptive Lithology  
 (m) (m/hr)



2170.00-2172.22m SANDSTONE:  
 Interlaminated with thin coaly layers (1mm) and laminae; which become less common below 2172.13m. Light to medium grey, moderately friable to dominantly moderately hard, fine to medium grained, subangular, well sorted, very micaceous, common carbonaceous material and laminae; silica cement, poor visual porosity.

Shows: 2170.12m - no fluorescence, very slow diffuse weak cream crush cut. Grades to shale at base.

2172.22-2176.09m SILTSTONE and SHALE:  
 Interbedded and interlaminated with common carbonaceous lenses. Siltstone medium grey to medium dark grey, moderately hard, quartzose with silic cement, micromicaceous, occasional carbonaceous flecks and laminae, occasional very fine grained quartz, common plant remains, grades to silty shale.

2176.09-2180.24m SANDSTONE: contains common carbonaceous lenses and lamina, occasional shale laminae - irregular, discontinuous, common from 2178.10-2178.50m. Light grey, moderately friable to moderately hard, very fine to medium grained, subangular to subrounded, moderately to well sorted, micaceous, common carbonaceous material, silica cement, poor visual porosity.

Shows: Trace pinpoint cream yellow fluorescence, very slow, very weak diffuse cream white cut and weak diffuse cream white crush cut. Visible pinpoint to patchy cream white fluorescence throughout core, with very strong fluorescence in some patches.

2180.24-2181.09m SHALE: massive with occasional siltstone laminae. Carbonaceous with common leaf remains. Medium dark grey, moderately hard to hard, micromicaceous, occasional very fine grained quartz.

Core No. 1 (contd)

Well : Wirrah 3

Interval Cored : 2170.00-2188.00m

Cut : 18.00m

Recovered : 17.90m (99%)

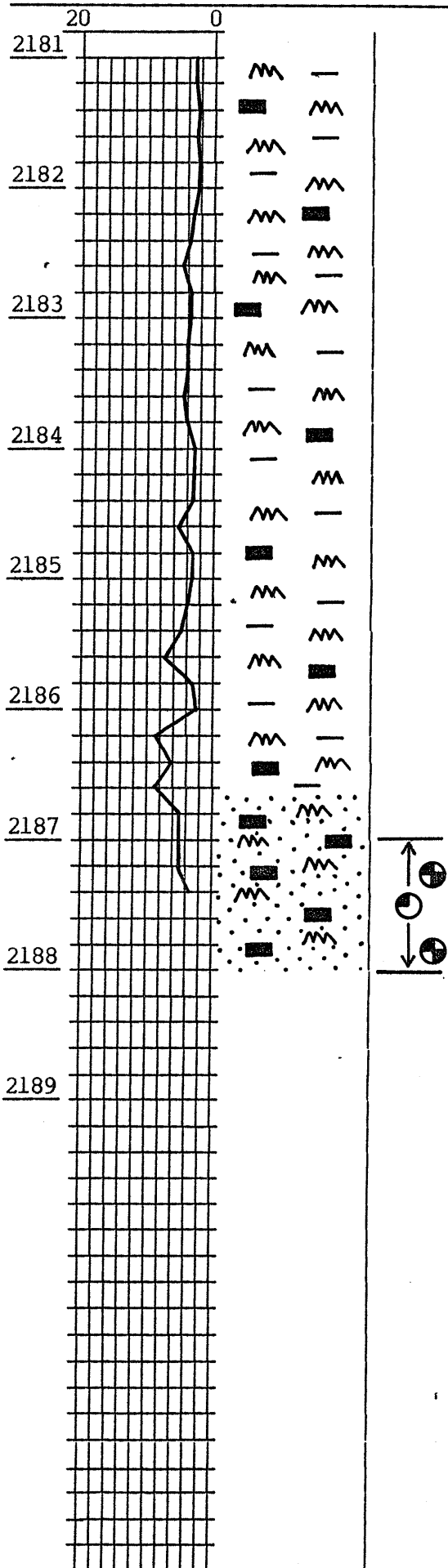
Bit Type : Christ RC-4

Bit Size : 8-1/2 ins.

Described by : M. Fittall

Date : 7/12/83

Depth & Int. ROP (m) (m/hr) Graphic Shows Descriptive Lithology



2181.09-2185.68m SILTSTONE and SHALE: siltstone - grading to shale, occasional laminae, otherwise bedding structures not visible. Coaly lenses, very carbonaceous in part. Medium dark grey, moderately hard, micromaceous to micaceous, carbonaceous specks, plant remains and other inclusions are common.

2185.68-2187.90m SANDSTONE: contains thin carbonaceous laminae and lenses of coal; silty near top, common irregular discontinuous shale and carbonaceous laminae. The sand is light grey, moderately friable to moderately hard, fine to medium grained, moderately to well sorted, common carbonaceous inclusions, subangular, occasional shale laminae, occasionally micaceous, silica cement, poor to occasionally moderate visible porosity.

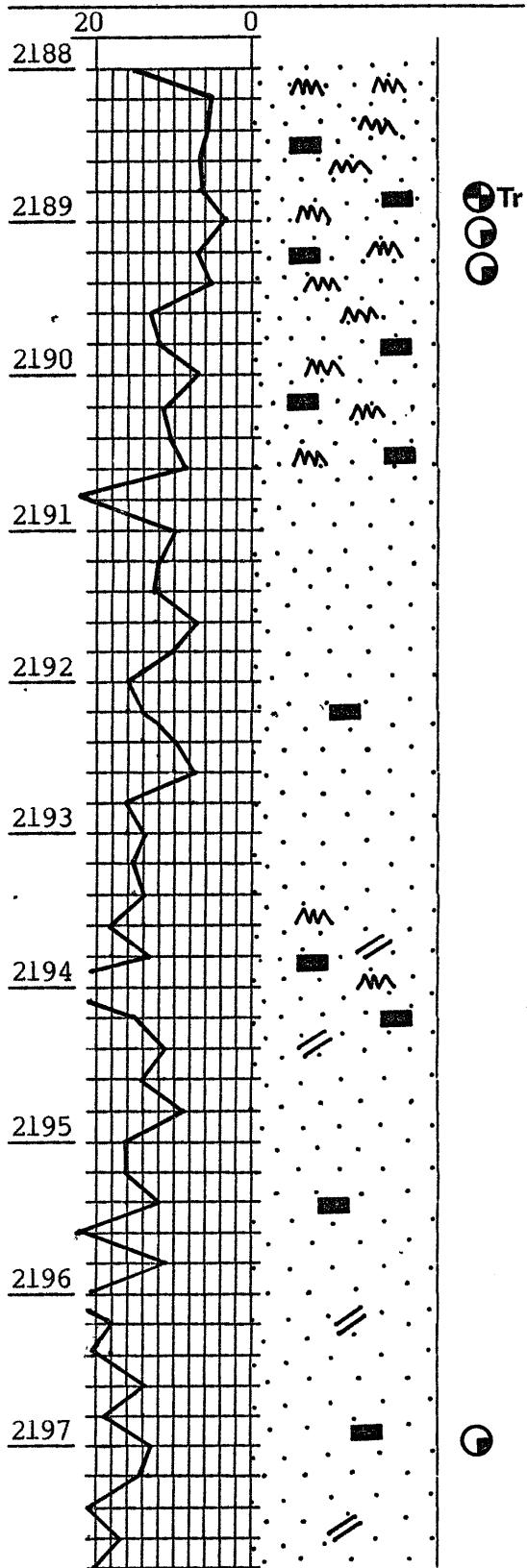
Shows: up to 60% bright cream yellow fluorescence, with instant streaming to blooming cream white cut. Cream white fluorescent mud on core. The remainder contains pinpoint to patchy cream white fluorescence.

2187.90-2188.00m NO RECOVERY



Core No. 2 Well : Wirrah-3  
 Interval Cored : 2188.00-2205.50m  
 Cut : 17.50m Recovered : 17.50m (100%)  
 Bit Type : Christ RC-4 Bit Size : 8-1/2"  
 Described by : M. Fittall Date : 7-8/12/83

Int. (m) Depth & ROP (m/hr) Graphic Shows Descriptive Lithology



2188.00-2201.60m SANDSTONE: generally massive, medium to coarse grained with occasional carbonaceous and silty irregular discontinuous laminae and streaks. From 2188.00-2190.74m the sandstone contains common discontinuous irregular carbonaceous lenses and laminae (1-3mm thick) with thin coal beds up to 2cm thick. Sandstone is generally fine grained, and silty near top of core. From 2193.48-2194.34m sandstone is fine grained to silty with thin (1-2mm) regular subparallel carbonaceous laminae. Below 2194.34m sandstone is massive, with occasional silty and carbonaceous laminae showing subparallel bedding. It is light to medium grey, moderately hard, fine to medium grained, occasionally coarse, angular to subangular, occasionally subrounded, occasionally poorly sorted, otherwise moderately to well sorted; commonly carbonaceous, commonly micaceous, rare pyrite, transparent to commonly translucent quartz grains, minor siliceous cement, poor to dominantly moderate visible porosity.

SILTSTONE: medium dark grey to dark grey, moderately hard, micromicaceous, rare pyrite, quartzose, very thin carbonaceous laminae. The siltstone grades up into sandstone with silt lenses common in base of sandstone.

Core No. 2 (contd)

Well : Wirrah-3

Interval Cored : 2188.00-2205.50m

Cut : 17.50m

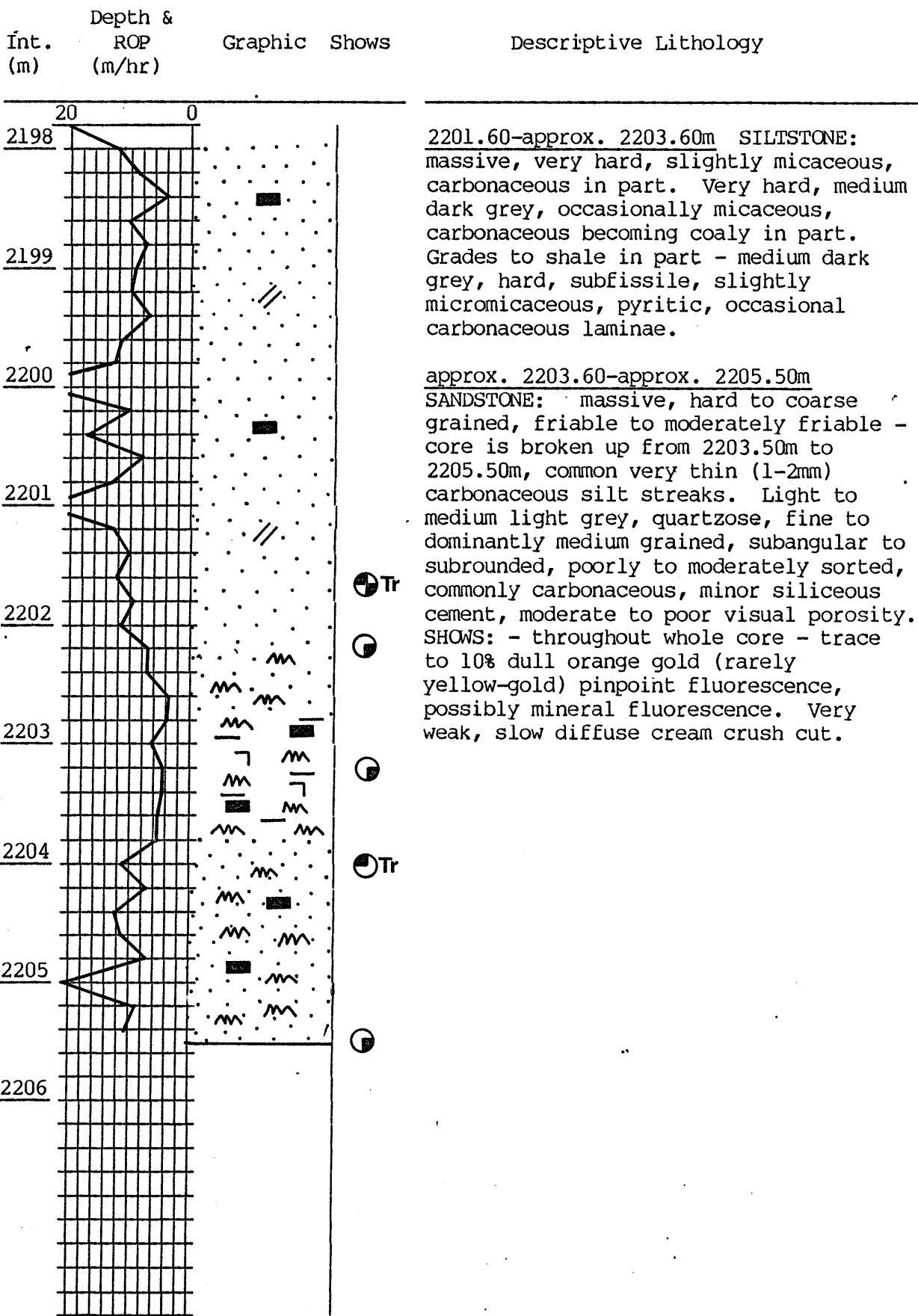
Recovered : 17.50m (100%)

Bit Type : Christ RC-4

Bit Size : 8-1/2"

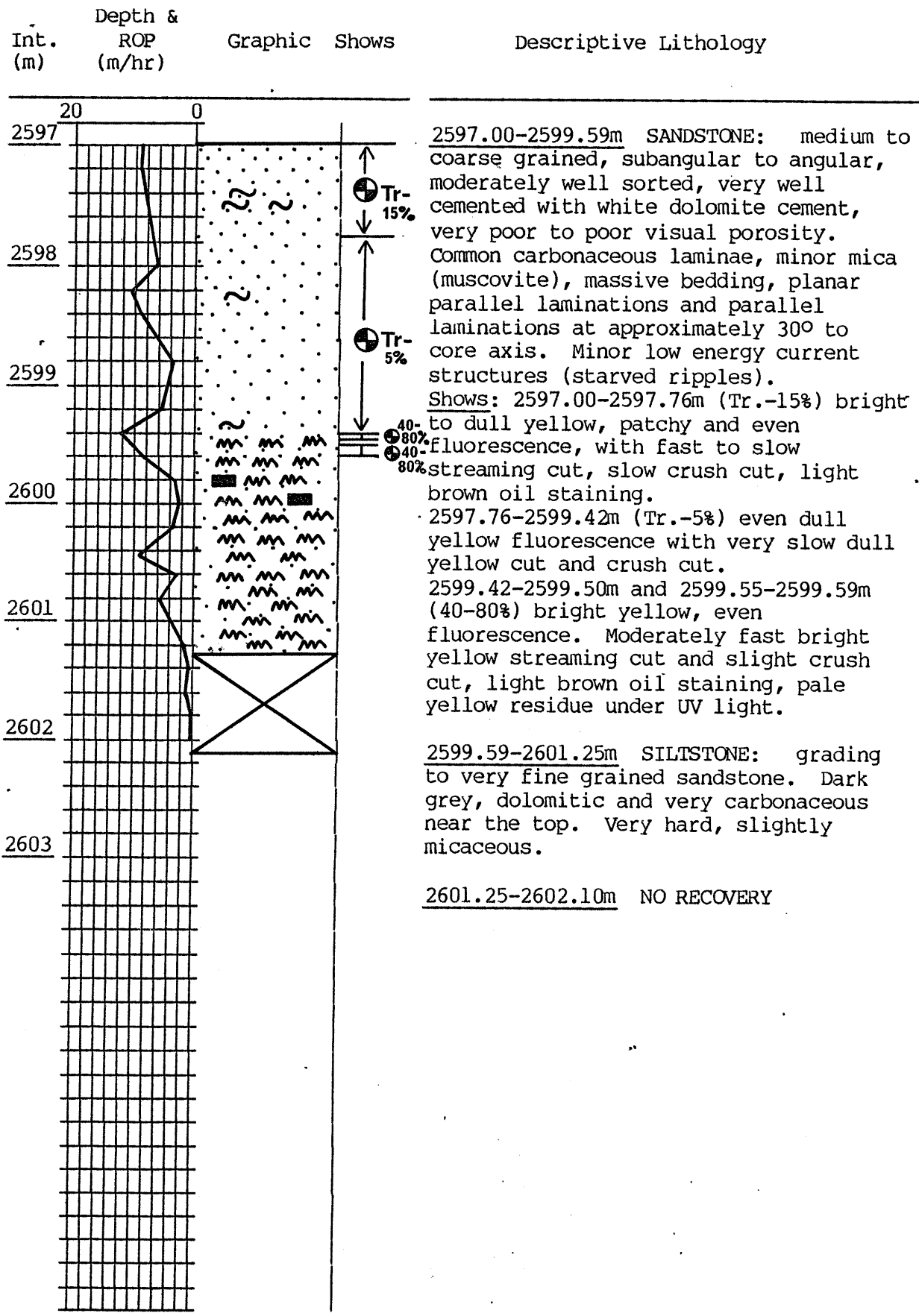
Described by : M. Fittall

Date : 7-8/12/83



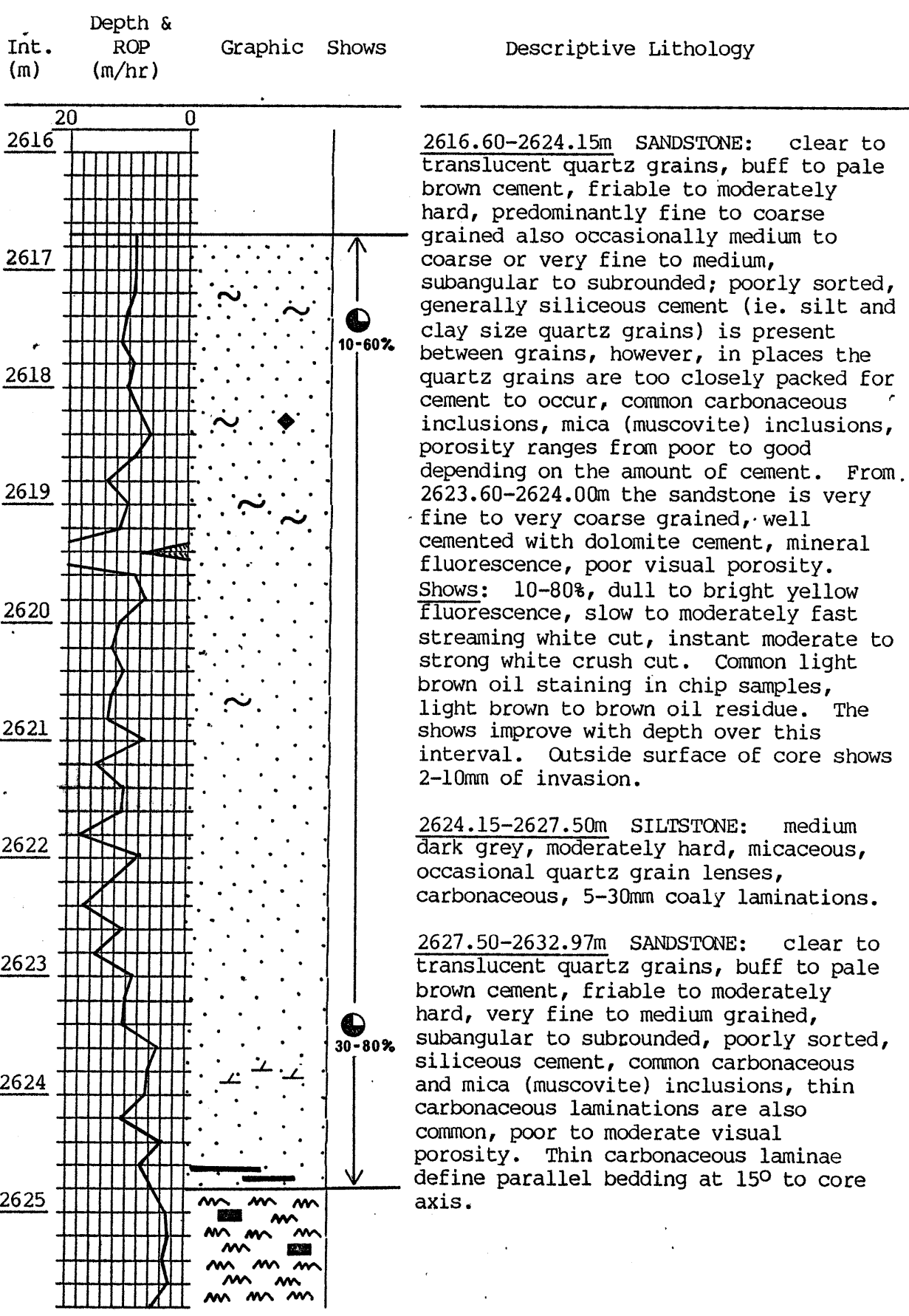
Core No. 3 Well : Wirrah-3

Interval Cored : 2597.00-2602.10m  
 Cut : 5.10m Recovered : 4.25m (83%)  
 Bit Type : Christ RC-4 Bit Size : 8-1/2"  
 Described by : R. Neumann Date : 16/12/83



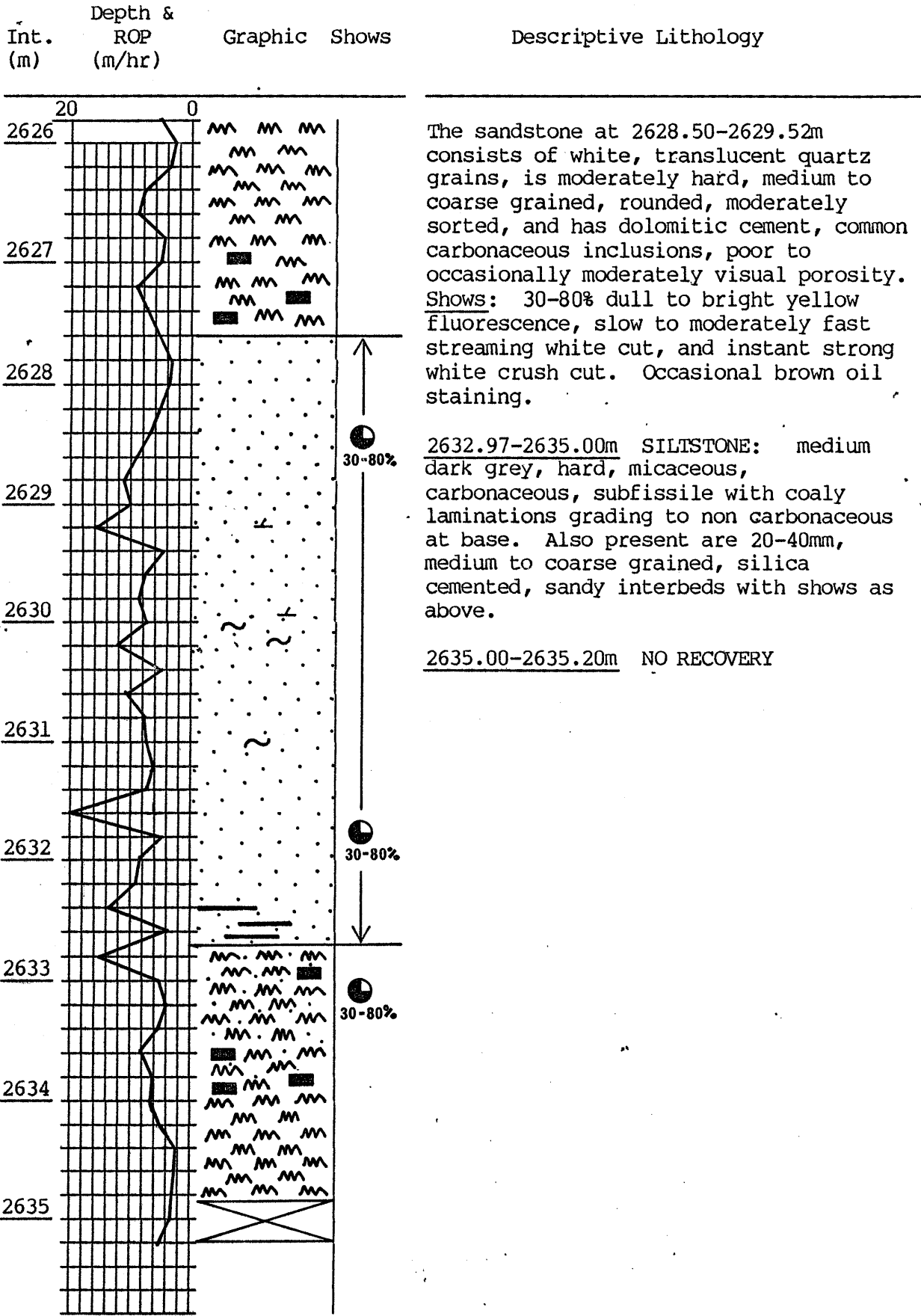
Core No. 4 Well : Wirrah-3

Interval Cored : 2616.60-2635.20m  
 Cut : 18.60m Recovered : 18.40m (99%)  
 Bit Type : Christ RC-3 Bit Size : 8-1/2"  
 Described by : P. Priest Date : 17/12/83



Core No. 4 (contd) Well : Wirrah-3

Interval Cored : 2616.60-2635.20m  
 Cut : 18.6m Recovered : 18.40m (99%)  
 Bit Type : Christ RC-3 Bit Size : 8-1/2"  
 Described by : P. Priest Date : 17/12/83





Core No. 5

Well : Wirrah-3

Interval Cored : 2635.20-2653.00m

Cut : 17.8m

Recovered : 17.80m (100%)

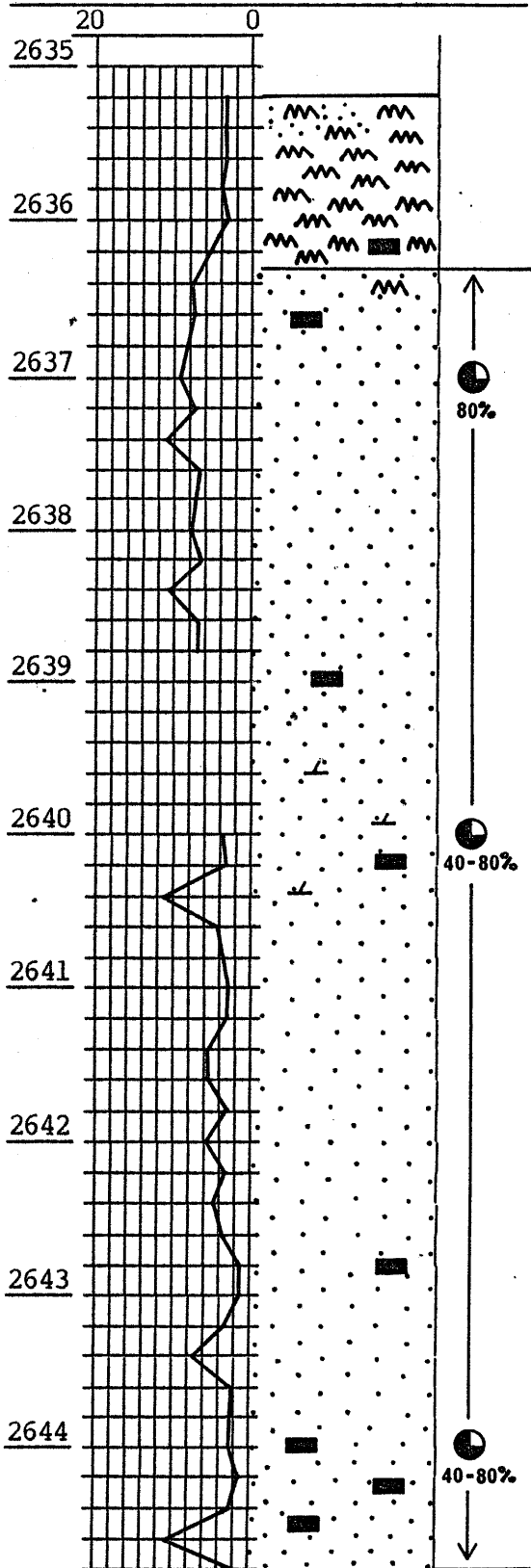
Bit Type : Christ RC-3

Bit Size : 8-1/2"

Described by : R. Neumann

Date : 18/12/83

Depth & Int. ROP Graphic Shows Descriptive Lithology  
(m) (m/hr)



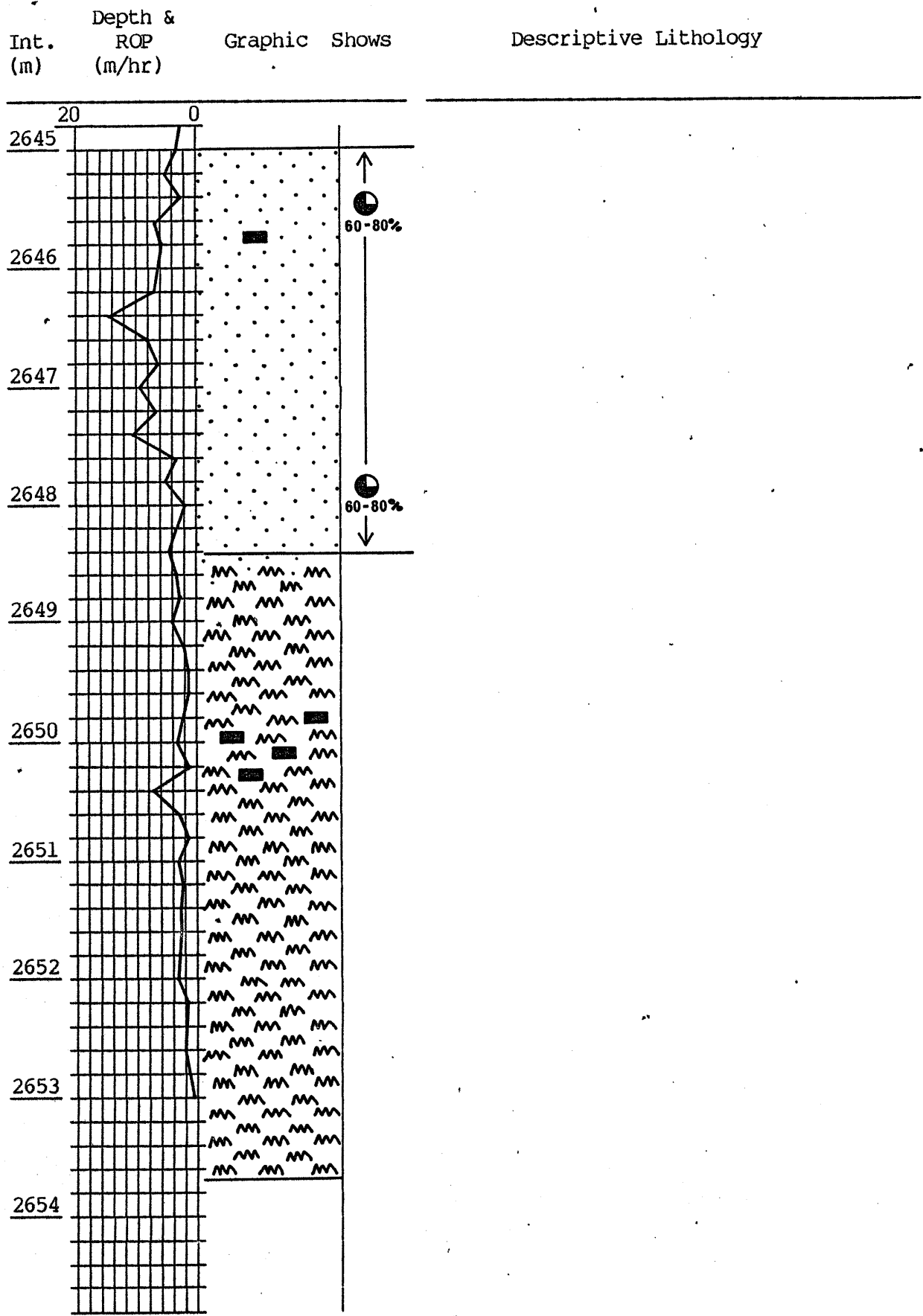
2635.20-2635.71m SILTSTONE: very sandy at top and base, grades into underlying sand through a silty sand. Medium dark grey to dark grey, slightly to very carbonaceous. Micromicaceous, massive to subfissile, moderately friable to moderately hard.

2635.71-2647.90m SANDSTONE: medium to fine grained, moderately well sorted, subangular, common silica cement (light brown with sucrosic texture) and minor clay matrix, slightly to very carbonaceous, very poor to moderate visual porosity, moderately hard to moderately friable. Massive to faintly parallel laminated. Moderate visual porosity (10-15%). Core ends commonly show 2-10mm invasion. Bottom 1m of sandstone moderately friable to friable, (best visual porosity).

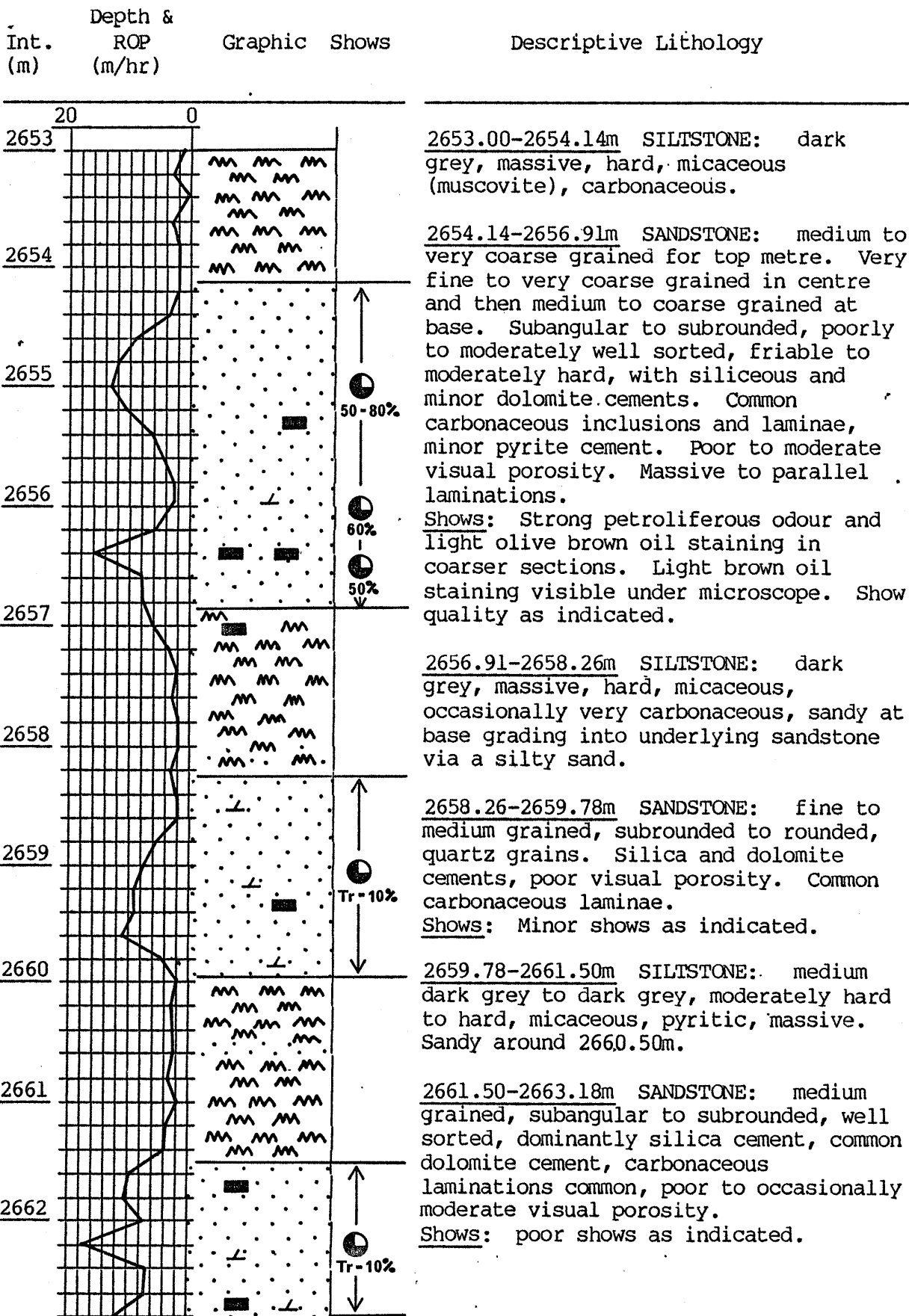
Shows: 10-80% dull to bright yellow fluorescence. Slow, weak to fast, strong streaming white cut. Weak to strong bright white crush cut. Common light brown oil residue. Show quality varies with porosity. Tight sands have dull yellow even fluorescence, weak bright white streaming cut and strong crush cut. More porous sands have bright yellow even fluorescence, strong fast bright white streaming cut, moderate, bright white crush cut.

2647.90-2653.00m SILTSTONE: medium dark grey to dark grey, slightly sandy, and slightly to very carbonaceous. Common micromicaceous (muscovite), massive to subfissile, moderately friable to hard.

Core No. 5 (contd) Well : Wirrah-3  
Interval Cored : 2635.20-3653.00m  
Cut : 17.8m Recovered : 17.80m (100%)  
Bit Type : Christ RC-3 Bit Size : 8-1/2"  
Described by : R. Neumann Date : 18/12/83



Core No. 6 Well : Wirrah-3  
 Interval Cored : 2653.00-2671.20m  
 Cut : 18.20m Recovered : 18.20m (100%)  
 Bit Type : Christ RC-4 Bit Size : 8-1/2"  
 Described by : R. Neumann Date : 18/12/83



Core No. 6 (contd)

Well : Wirrah-3

Interval Cored : 2653.00-2671.20m

Cut : 18.20m

Recovered : 18.20m (100%)

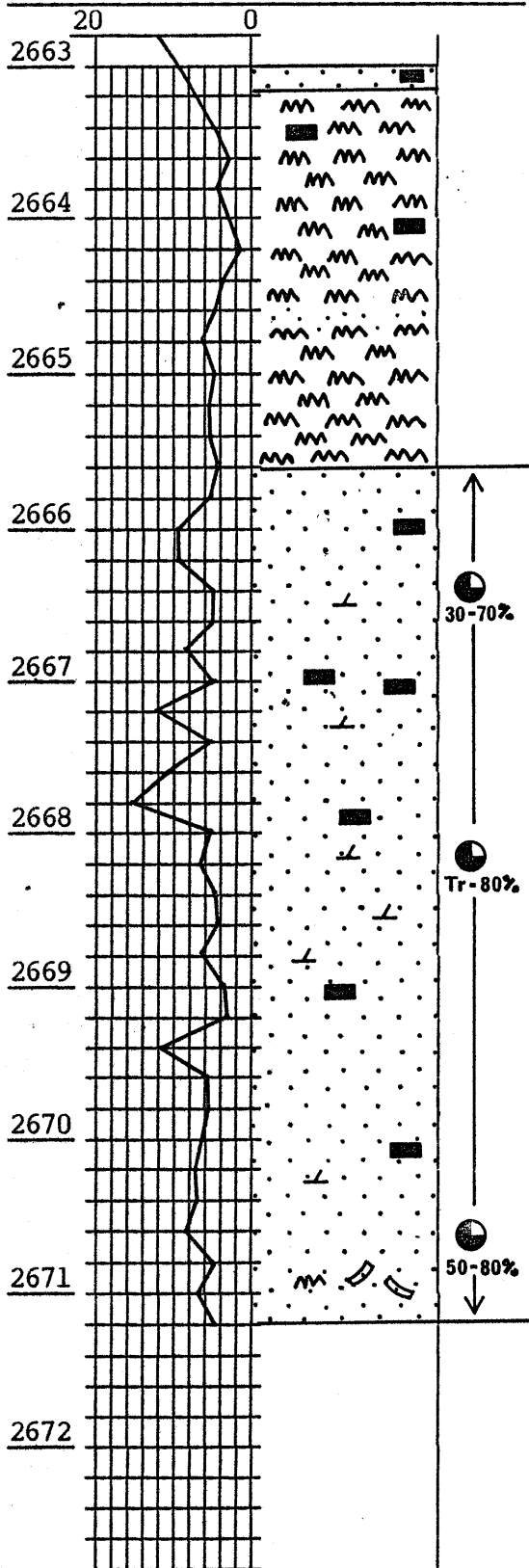
Bit Type : Christ RC-4

Bit Size : 8-1/2"

Described by : R. Neumann

Date : 18/12/83

Depth & Int. ROP Graphic Shows Descriptive Lithology  
(m) (m/hr)



2663.18-2665.61m SILTSTONE: medium dark grey, moderately hard, micaceous, massive minor carbonaceous laminae.

2665.61-2671.20m SANDSTONE: fine to medium grained, subrounded, micaceous, common carbonaceous laminae defining horizontal and inclined (15-20°) parallel laminations as well as low energy current structures, (starved ripples, small scale cross beds). Silica and patchy dolomite cements [where dolomite cement is present there is low porosity and hydrocarbon shows are very poor]. Poor to moderate visual porosity, dominantly poor. Rip up clasts (1-6cm long) set in medium grained sandstone matrix from 2670.8-2671.2m. Composed of parallel laminated siltstone showing syndepositional (plastic) deformation. Shows: Common brown oil staining and petroliferous odour. Note: Gas bubbles were seen escaping from core for approximately 5 mins after removal from core barrel - reflects poor porosity of most of this sand interval. Shows vary according to porosity (cementation intensity) as indicated.

Core No. 7

Well : Wirrah-3

Interval Cored : 2672.00-2690.50m

Cut : 18.50m

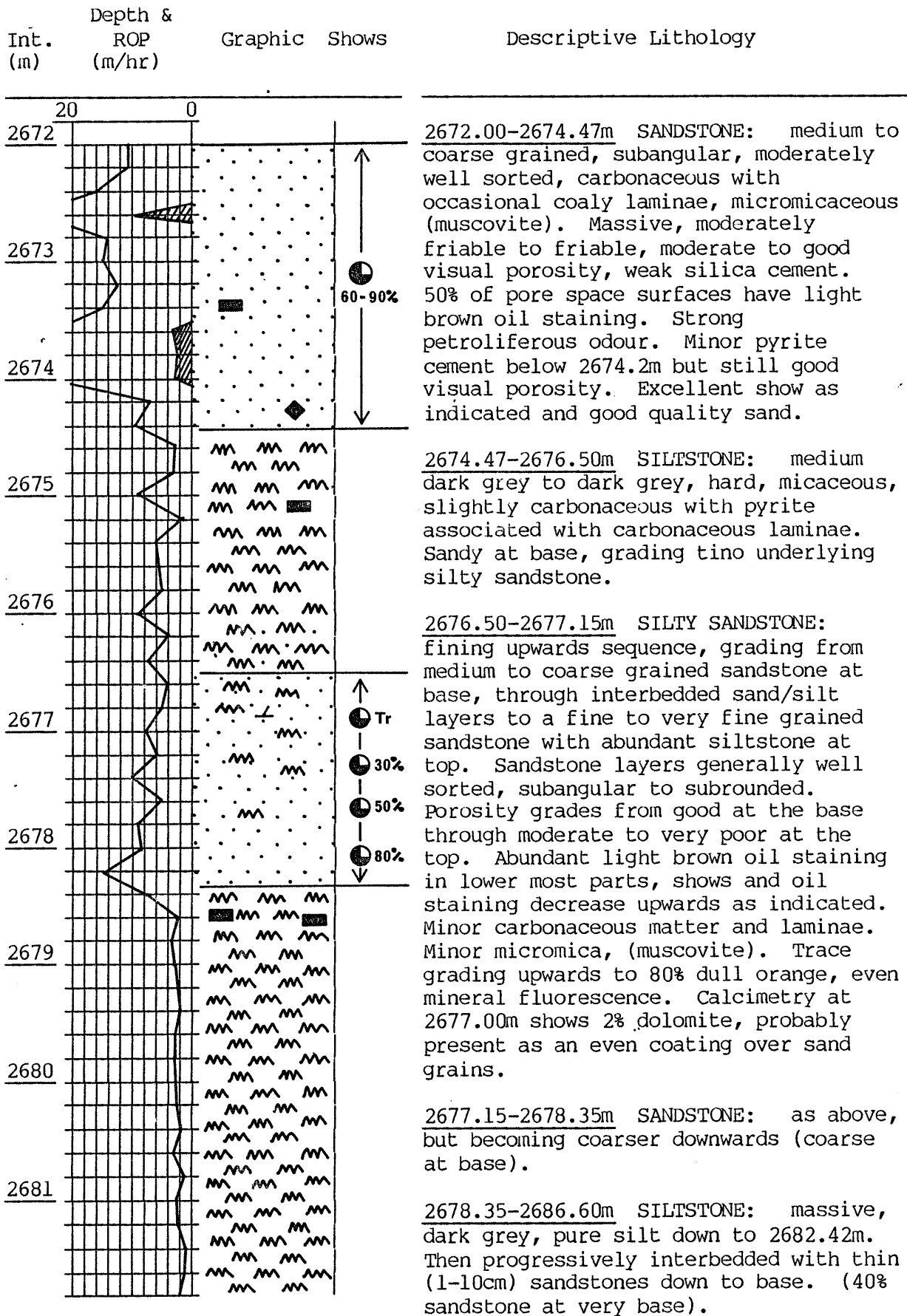
Recovered : 18.50m (100%)

Bit Type : Christ RC-4

Bit Size : 8-1/2"

Described by : R. Neumann

Date : 20/12/83



Core No. 7 (contd)

Well : Wirrah-3

Interval Cored : 2672.00-2690.50m

Cut : 18.50m

Recovered : 18.50m (100%)

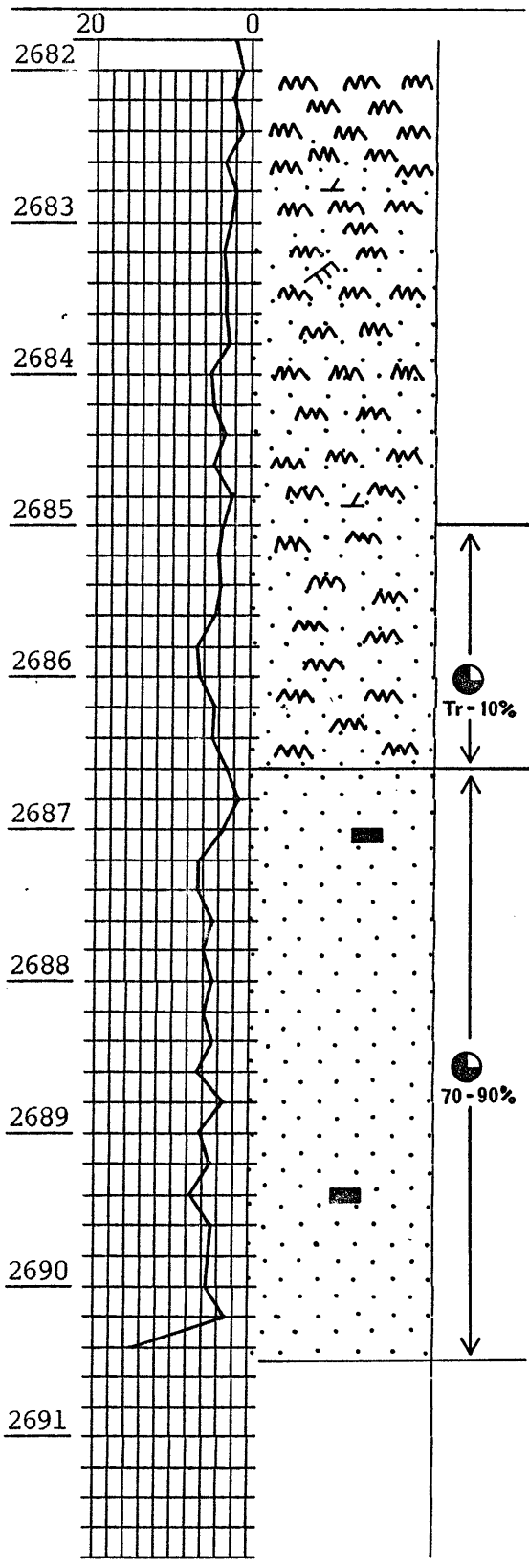
Bit Type : Christ RC-4

Bit Size : 8-1/2"

Described by : R. Neumann

Date : 20/12/83

	Depth &		
Int.	ROP	Graphic Shows	Descriptive Lithology
(m)	(m/hr)		



2678.35-2686.60m SILTSTONE: (contd)  
 Sandy section shows abundant stacked sequences of climbing ripples; siltstone on stoss sides, sandstone on lee sides of ripples. Also minor soft, sediment slumpings, abundant horizontal and inclined (10-20°) parallel laminations, highlighted by sandstone/siltstone interbeds. Sandy layers have zero to moderate porosity (better towards the base), are medium to occasionally coarse grained, well sorted and subangular. Trace to 80% dull even orange mineral fluorescence. Calcimetry at 2682.78 = 3% dolomite.

Shows: Core from 2683.00 to approximately 2685.00m had light brown oil bleeding from core. Oil fluorescence - bright yellow. Bleeding for approximately 5 minutes after core removed from barrel. Shows are moderate at base of interval as indicated. Sands in the basal metre have a strong petroliferous odour.

2686.60-2690.50m SANDSTONE: fine to medium grained, well sorted, subrounded, moderately hard to friable, slightly carbonaceous, slightly micaceous. Poor to good visual porosity (generally moderate to good), weak to moderately strong silica cement.

Shows: 60% of pore space surfaces had light brown oil staining. Good to excellent shows as indicated.

111/

Core No. 8

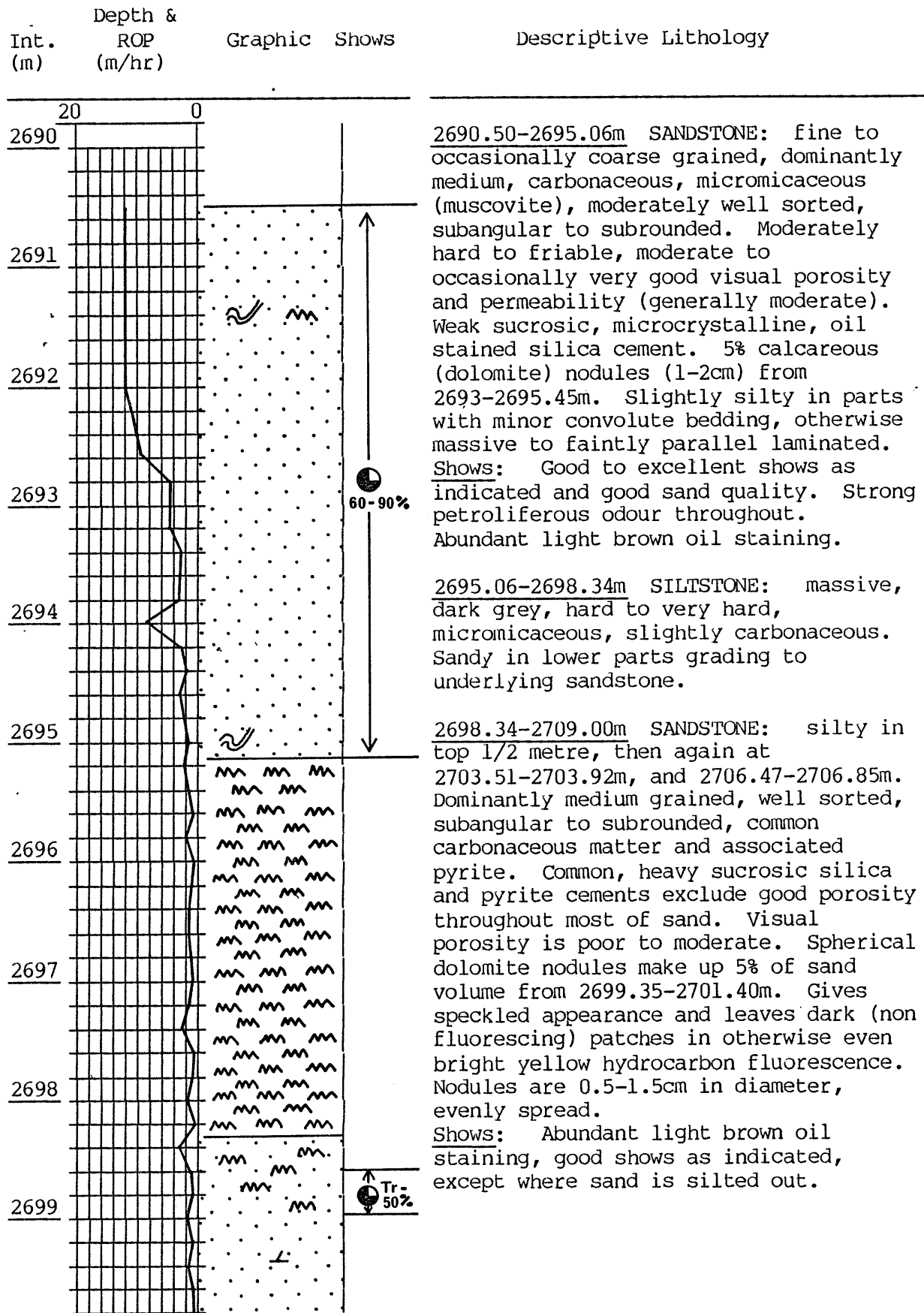
Well : Wirrah-3

Interval Cored : 2690.50-2709.00m

Cut : 18.50 Recovered : 18.50m (100%)

Bit Type : Christ C-20 Bit Size : 8-1/2"

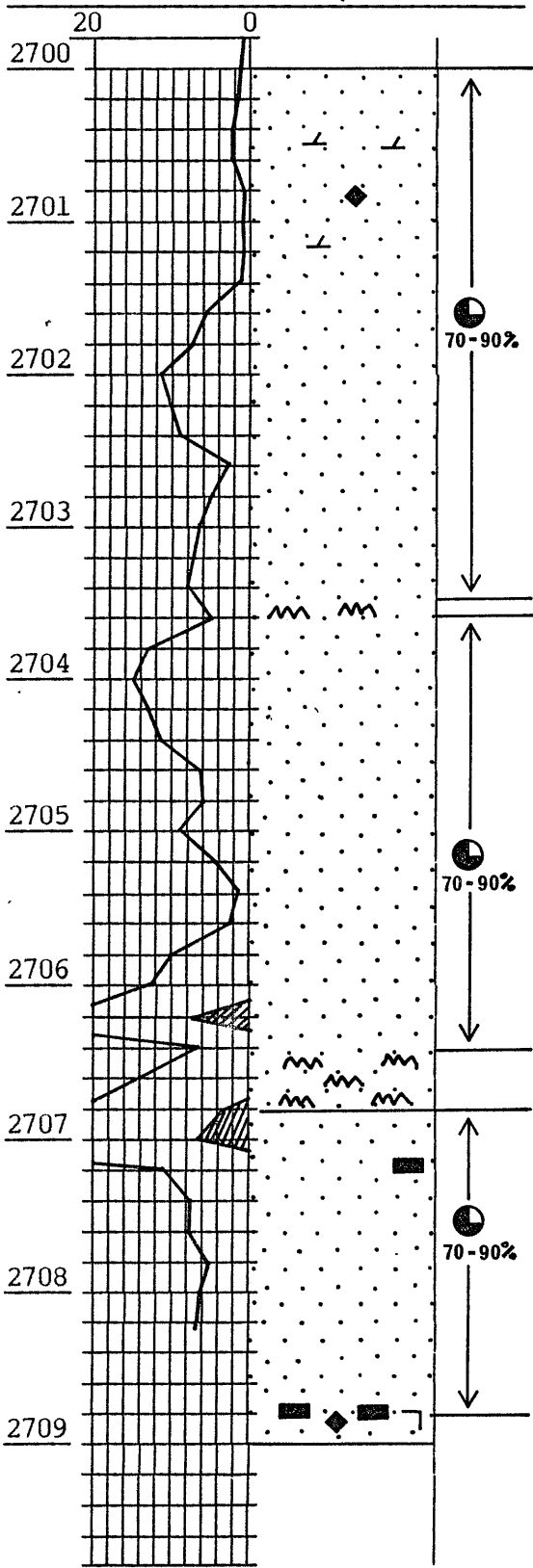
Described by : R. Neumann Date : 21/12/83



Core No. 8 (contd) Well : Wirrah-3

Interval Cored : 2690.50-2709.00m  
 Cut : 18.50m Recovered : 18.50m (100%)  
 Bit Type : Christ C-20 Bit Size : 8-1/2"  
 Described by : R. Neumann Date : 21/12/83

Depth & Int. ROP Graphic Shows Descriptive Lithology  
 (m) (m/hr)





Core No. 9 Well : Wirrah-3

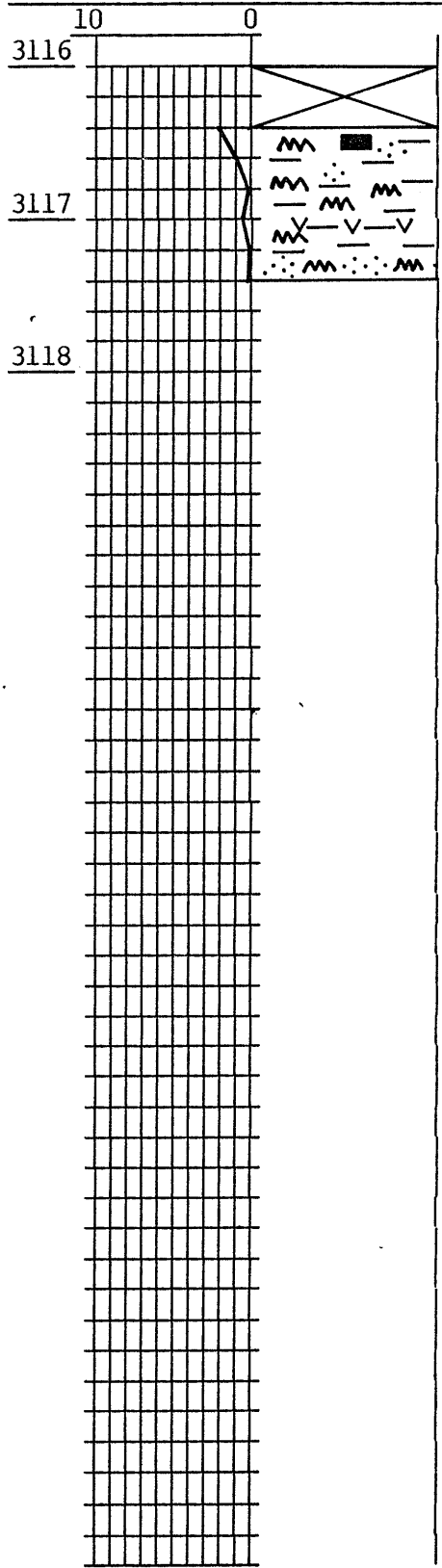
Interval Cored : 2806.80-2814.00m  
 Cut : 7.20m Recovered : 7.10m (99%)  
 Bit Type : Christ RC-6 Bit Size : 8-1/2"  
 Described by : L. Finlayson Date : 31/12/83

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
2806			2806.80-2807.10m SANDSTONE: medium to coarse quartz sandstone. Poorly sorted with common silica cement. Poor to moderate visual porosity. Shows: 50-70% bright yellow fluorescence with strong instantaneous bright blue white cut.
2807			2807.10-2807.66m SHALE: dark grey, hard, coaly in part, sandy towards base.
2808			2807.66-2810.16m SANDSTONE: coarse quartz sandstone, well sorted with common silica cement. Moderate visual porosity. Shows: 90-100% bright yellow fluorescence with strong instantaneous bright blue white cut.
2809			2810.16-2810.26m CONGLOMERATE: well rounded quartz and shale pebbles in a medium to coarse poorly sorted sandstone matrix. Silica cement common. Very hard. Trace carbonaceous material. Very low visual porosity. Shows: 50% bright yellow fluorescence with moderate instant blue white cut.
2810			2810.26-2811.30m SANDSTONE: coarse quartz sandstone, well sorted, shaley in part with common silica cement. No visual porosity. Trace carbonaceous material. occasionally very coarse, well rounded grains. Very hard. Shows: no fluorescence.
2811			2811.30-2812.45m CONGLOMERATE: as above with no visual porosity. Some quartz veins present. Very coarse matrix with large pebbles (10-20cm). Coaly in part. Shows: No fluorescence.
2812			2812.45-2813.67m SANDSTONE: as above, pyrite cement common, coaly in part. Shows: No fluorescence.
2813			2813.67-2813.75m CONGLOMERATE: as above. Shows: No fluorescence.
2814			2813.75-2814.00m NO RECOVERY

Core No. 10 Well : Wirrah-3

Interval Cored : 3116.10-3117.50m  
 Cut : 1.40m Recovered : 1.00m (71%)  
 Bit Type : C-20 Bit Size : 8-15/32"  
 Described by : M. Fittall Date : 10/1/84

Int. (m) Depth & ROP (m/hr) Graphic Shows Descriptive Lithology



3116.10-3116.50m NO RECOVERY

Overall Appearance: Interbedded siltstone and shale with sandstone lenses. Irregularly bedded, with lenses and clasts present, no regular bedding. Whole of core is extremely hard with a flinty appearance, very angular. Appears to be silicified.

3116.48-3116.59m core broken up.  
 3117.07-3117.40m core broken up.

3116.50-3116.80m Dominantly shaley with lenses of siltstone and sandstone. Black, vitreous, carbonaceous material in top of core. Core broken at 45° to axis at 3116.43m on carbonaceous shale, 2-3mm thick.

3116.80-3117.05m Dominantly silty grading to sandstone. Occasional shale lenses and olive grey rounded clasts, some with possible volcanic content.

3117.05-3117.40m Dominantly shaley with siltstone and sandstone lenses. Olive grey shale, possibly volcanic content, with occasional green grey and reddish brown tinges. Becoming sandy towards base.

3117.40-3117.50m Dominantly siltstone with common sandstone lenses.

Shows: Patchy spotty cream yellow fluorescence in top 3cm of core.

Patchy spotty fluorescence in sandstone lens at 3116.66m. Scattered patchy spotty fluorescence from 3116.80 to 3117.05m.

1 cm thick lens of sandstone with 50% spotty yellow fluorescence at 3117.43m. Other patches of spotty fluorescence in sandstone lenses up to 3117.39m.

SANDSTONE: light grey brown, extremely hard, quartzose, very fine to dominantly fine grained, occasionally medium; subangular, moderately sorted, very well cemented with silica, common silty matrix, recrystallised texture, no visible porosity.

Core No. 10 (contd) Well : Wirrah-3

Interval Cored : 3116.10-3117.50m  
Cut : 1.40m Recovered : 1.00m (71%)  
Bit Type : C-20 Bit Size : 8-15/32"  
Described by : M. Fittall Date : 10/1/84

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
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Shows: Spotty cream yellow fluorescence gives streaming to blooming milky white cut.

SILTSTONE: medium grey to olive grey, extremely hard, recrystallised texture, very angular, slightly to very argillaceous, slightly carbonaceous with occasional very thin carbonaceous laminae, slightly micromicaceous, grades from very fine to fine grained sandstone in part.

SHALE: dark brown grey to dark grey, extremely hard, very angular, commonly carbonaceous with vitreous chips and laminae, slightly to moderately silty, recrystallised texture.

Core No. 11 Well : Wirrah-3  
 Interval Cored : 3143.40-3145.40m  
 Cut : 2.00m Recovered : 1.62m (81%)  
 Bit Type : C-23 Bit Size : 8-15/32"  
 Described by : M. Fittall Date : 12/1/84

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
3143			3143.40-3143.78m NO RECOVERY
3144			<p>3143.78-3144.34m CONGLOMERATE: medium grey with white and grey quartz and quartzite pebbles, very hard, silicified. Pebbles are 3mm to 80mm, very to well rounded in poorly sorted matrix; occasionally elongate showing imbrication of 30-40° to axis of core. Becoming less pebbly towards base of interval.</p> <p>Trace of patchy cream yellow fluorescence from matrix throughout interval, pebbles also fluoresce. Gives slow diffuse milky white cut. Very poor visual porosity. Matrix is fine to granule size, subangular to subrounded, poorly sorted, very well cemented - silic, silty, slightly carbonaceous in part.</p>
3145			3144.34-3145.40m SANDSTONE: massive sandstone, no visible bedding. Conglomeratic from 3144.34 to 3144.50m, 3144.86 to 3144.99m, 3145.10 to 3145.17m, 3145.34 to 3145.40m, rounded pebbles 3mm to 20mm. Silty and carbonaceous from 3144.50 to 3144.54m. Thin carbonaceous layer (2-3mm) at 3145.20 at 30° to axis, carbonaceous between 3145.07 and 3145.10m. Sandstone is medium grey, very hard, quartzose, fine to very coarse, dominantly medium grained; subangular to subrounded, very well cemented, silic; poorly to well sorted, occasionally dark grey to grey quartzite grains, occasional clay matrix, slightly carbonaceous in part, very poor visual porosity. Shows: 60-70% even spotty dull cream yellow fluorescence with slow streaming to blooming milky white cut and moderate to strong milky white crush cut.
3146			

APPENDIX 3

APPENDIX - 3  
SIDEWALL CORE DESCRIPTIONS

WIRRAH - 3

SIDEWALL CORE DESCRIPTIONS

<u>No.</u>	<u>Depth</u>	<u>Rec.</u> <u>(mm)</u>	<u>Rock</u> <u>Type</u>	<u>Description</u>
1	2934.0	15	Sandstone	White to grey, very fine to medium grained, poorly sorted, subangular, firm to hard, non calcareous, moderately pyritic, slightly micaceous, well cemented;
			Siltstone	Brown grey, hard, non calcareous, very microcarbonaceous, argillaceous. 20% spotty faint orange gold fluorescence, bright creamy white moderately strong cut, faint light brown residue (gold yellow fluorescent residue under UV light). C1 C2 C3 C4 C5 C6 93 129 56 31 21 Tr.
2	2900.0	10	Sandstone	Light grey, very fine to medium grained, poorly sorted, subangular, hard, non calcareous, very carbonaceous, common laminae, very slightly micaceous, slightly argillaceous, well cemented (silic); trace spotty faint gold fluorescence; bright cream white, moderately strong cut; even light brown residue (orange gold fluorescent residue under UV light). C1 C2 C3 C4 C5 C6 50 153 79 41 28 16
3	2875.0	20	Sandstone	White to light grey, fine to medium grained, moderately sorted, subangular, hard, non calcareous, slightly carbonaceous, minor dark lithic grains, well cemented silic;
			Shale	Dark grey, slightly microcarbonaceous, slightly silty, very hard, non calcareous, micromicaceous; 50% spotty bright milky white fluorescence, dull milky to bluish white cut, dull tan residue (milky white fluorescent residue under UV light). C1 C2 C3 C4 C5 C6 77 42 29 25 5 Tr.
4	2845.9			No Recovery
5	2825.0			No Recovery
6	2823.6	20	Shale	Dark grey, very hard, common coaly particles, very microcarbonaceous, non calcareous.
7	2800.0	15	Siltstone	Medium grey, very hard, very argillaceous, non calcareous, microcarbonaceous.
8	2789.0	20	Siltstone	Dark grey, carbonaceous, slightly micaceous, very hard, non calcareous, argillaceous.
9	2775.0	15	Shale	Dark grey, slightly silty, hard, non calcareous, slightly carbonaceous.

10	2764.0	40	Shale	Dark grey, very hard, non calcareous, slightly carbonaceous.												
11	2756.5	20	Sandstone	Light grey, medium grained, moderately sorted, subangular, firm, non calcareous, minor dark grains, minor white clay matrix; 80% even bright cream white fluorescence, bright, milky to cream white, moderately strong cut, very faint tan residue (milky white fluorescent residue under UV light). <table border="1"> <thead> <tr> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>C5</th> <th>C6</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>Tr.</td> <td>Tr.</td> <td>40</td> <td>57</td> <td>19</td> </tr> </tbody> </table>	C1	C2	C3	C4	C5	C6	20	Tr.	Tr.	40	57	19
C1	C2	C3	C4	C5	C6											
20	Tr.	Tr.	40	57	19											
12	2750.3			No Recovery												
13	2747.7	20	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, non calcareous, minor dark grains; 20% patchy faint cream white fluorescence, dull cream cut. <table border="1"> <thead> <tr> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>C5</th> <th>C6</th> </tr> </thead> <tbody> <tr> <td>103</td> <td>117</td> <td>924</td> <td>1122</td> <td>299</td> <td>110</td> </tr> </tbody> </table>	C1	C2	C3	C4	C5	C6	103	117	924	1122	299	110
C1	C2	C3	C4	C5	C6											
103	117	924	1122	299	110											
14	2744.6	15	Siltstone	Light grey, firm, non calcareous, argillaceous, carbonaceous, slightly sandy.												
15	2742.5	50	Coal	Grey to black, hard, dull, earthy, shaley.												
16	2737.0	30	Sandstone	Light grey, very fine to fine grained, poorly sorted, subangular, firm to hard, non calcareous, very carbonaceous, common laminae, slightly argillaceous, well cemented, slightly micaceous; trace spotty dull gold fluorescence, bright, cream to milky white, moderately strong cut, faint tan residue (patchy gold fluorescent residue under UV light). <table border="1"> <thead> <tr> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>C5</th> <th>C6</th> </tr> </thead> <tbody> <tr> <td>1390</td> <td>740</td> <td>640</td> <td>193</td> <td>42</td> <td>10</td> </tr> </tbody> </table>	C1	C2	C3	C4	C5	C6	1390	740	640	193	42	10
C1	C2	C3	C4	C5	C6											
1390	740	640	193	42	10											
17	2722.1	25	Shale	Brown grey, very hard, non calcareous, slightly silty, very slightly carbonaceous.												
18	2719.9	30	Shale	Dark grey, very hard, non calcareous, slightly silty.												
19	2713.0	30	Shale	Dark grey, very hard, slightly silty, non calcareous.												
20	2709.8	20	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular, firm, non calcareous, slightly micaceous, very slightly carbonaceous; 90% even bright cream white fluorescence; bright milky white strong cut; faint film cut residue (patchy milky white fluorescent residue under UV light). <table border="1"> <thead> <tr> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>C5</th> <th>C6</th> </tr> </thead> <tbody> <tr> <td>106</td> <td>151</td> <td>145</td> <td>153</td> <td>114</td> <td>19</td> </tr> </tbody> </table>	C1	C2	C3	C4	C5	C6	106	151	145	153	114	19
C1	C2	C3	C4	C5	C6											
106	151	145	153	114	19											
21	2695.5	15	Siltstone	Medium grey, hard, non calcareous, argillaceous, slightly carbonaceous.												
22	2675.0			No Recovery												



23	2650.0	20	Siltstone	Dark grey, firm, non calcareous, argillaceous, microcarbonaceous, slightly micaceous.
24	2625.0	20	Shale	Dark grey, hard, non calcareous, carbonaceous, slightly silty.
25	2604.9	30	Shale	Dark grey, very hard, non calcareous, micromicaceous, microcarbonaceous.
26	2600.0	25	Shale	Dark grey, hard, non calcareous, microcarbonaceous.
27	2593.0	30	Shale	Dark grey to black, hard, non calcareous, very microcarbonaceous, coaly particles.
28	2588.9	20	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular to subrounded, firm, non calcareous, slightly carbonaceous, well cemented; 70% patchy moderately bright cream white fluorescence, moderately bright milky white, moderately strong cut, residue not visible, (patchy milky white fluorescent residue under UV light). C1 C2 C3 C4 C5 C6 21 8 20 35 32 Tr.
29	2582.1	30	Shale	Dark grey, very hard, non calcareous, very pyritic.
30	2580.2	25	Sandstone	Light grey, fine grained, moderately sorted, subangular, hard, non calcareous, very well cemented - silic, no shows, no porosity.
31	2574.7	5		Very poor recovery - mud and hard chips, some sandstone? C1 C2 C3 C4 C5 C6 10 4 Tr.
32	2572.5	10	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, hard, non calcareous, very well cemented, no shows, no porosity. C1 C2 C3 C4 C5 C6 25 11 12 5 Tr.
33	2568.4	20	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, non calcareous, very well cemented, slightly micaceous, minor white clay matrix; 10% patchy dull milky white fluorescence faint, very weak cream white cut. C1 C2 C3 C4 C5 C6 23 40 16 15 Tr.
34	2565.1	15	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, non calcareous very well cemented, (silic cement), minor white clay matrix, slightly micaceous; no shows. C1 C2 C3 C4 C5 C6 19 8 11 5 Tr.
35	2562.0			Pulled Off

36	2558.4	20	Shale	Medium grey, hard, non calcareous, slightly silty.
37	2557.0	15	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular to subrounded, firm, non calcareous, very well cemented, silic; 50% patchy bright milky white fluorescence, moderately bright milky white, moderate cut, residue not visible, (weak milky white fluorescent residue under UV light).
38	2555.9	15	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular, firm, non calcareous, silty, carbonaceous laminae, well cemented; dull cream white weak cut, residue not visible, (weak cream fluorescent residue under UV light).
39	2552.5	15	Siltstone	Brown grey, hard, non calcareous, microcarbonaceous, argillaceous, carbonaceous laminae.
40	2547.5	10	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, slightly calcareous, well cemented, silic and dolomitic; 30% patchy moderately bright cream white fluorescence, dull, weak milky white cut, residue not visible, possible mineral fluorescence. C1    C2    C3    C4    C5    C6 13    8    12    Tr.
41	2543.5	15	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular, firm, very slightly calcareous, well cemented, white clay matrix?; no shows (poor recovery with a lot of mud in sample). C1    C2    C3    C4    C5    C6 10    5    7    Tr.
42	2539.2	15	Siltstone	Brown grey, very hard, non calcareous, very argillaceous, slightly micaceous.
43	2530.2	15	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular, firm, non calcareous, well cemented, silic, (sample is broken up as with other sands); 30% patchy dull milky white fluorescence, dull, very weak milky white cut; residue not visible; probable mineral fluorescence.
44	2527.5	20	Sandstone	White to light grey, fine to medium grained, moderately sorted, subangular, soft, slightly calcareous, abundant white clay? matrix; 20% patchy dull milky white florescence, mineral fluorescence.
45	2526.0			No Recovery

46	2521.2	10	Sandstone	White to light grey, fine to medium grained, moderately sorted, subangular, firm, slightly calcareous, wite clay? matrix, very slightly micaceous, occasional grey grains; no shows. C1 C2 C3 C4 C5 C6 15 5 9 Tr.
47	2517.0	25	Siltstone	Brown grey, firm, non calcareous, argillaceous, carbonaceous.
48	2512.6	10	Sandstone	Brown grey, fine to medium grained, poorly sorted, subrounded, firm, non calcareous, very silty, slightly argillaceous, slightly carbonaceous.
49	2508.0			No Recovery
50	2506.4	30	Sandstone	Light grey, very fine to medium grained, poorly sorted, subangular, firm, non calcareous, well cemented, white clay matrix, 20% patchy bright milky white fluorescence, mineral fluorescence.
51	2502.1	15	Siltstone	Medium grey, very hard, slightly micaceous, non calcareous, argillaceous.
52	2498.5	30	Shale	Medium grey, hard, subfissile, non calcareous, carbonaceous flecks.
53	2495.7	20	Sandstone	Light grey, very fine to fine grained, poorly sorted, subangular, firm, slightly calcareous, common white clay? matrix - sand is shattered, was well cemented; 20% patchy dull cream white fluorescence, dull cream white, very weak cut, residue not visible, possible mineral fluorescence.
54	2491.5	30	Sandstone	Light grey, fine grained, moderately sorted, subangular, firm, very slightly calcareous, silty laminae, well cemented, no shows.
55	2484.7	40	Shale	Medium grey, hard, non calcareous, slightly silty, argillaceous.
56	2479.6	30	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, moderately calcareous, white clay? matrix, slightly carbonaceous; 20% patchy dull cream white fluorescence, dull cream white, very weak cut; residue not visible. C1 C2 C3 C4 C5 C6 119 80 36 31 Tr.
57	2474.5	30	Sandstone	Light grey, fine to medium grained, moderately sorted, subangular, hard, non calcareous, well cemented, slightly silty; 90% even bright cream fluorescence, bright, creamy white to milky white, very strong cut; faint light brown residue, (milky white fluorescent residue under UV light). C1 C2 C3 C4 C5 C6 19 34 125 245 413 421

58	2467.5	40	Shale	Medium grey, hard, very slightly calcareous, carbonaceous flecks.
59	2459.5	30	Shale	Medium grey, hard, non calcareous, silty, argillaceous.
60	2453.8	20	Siltstone	Light grey, hard, slightly calcareous, sandy, cemented, carbonaceous flecks.
61	2449.9	30	Dolerite	Black to very dark green, crystalline texture.
62	2435.6	20	Siltstone	Brown grey, very hard, very well cemented, non calcareous, argillaceous.
63	2427.0			No Recovery
64	2424.0	35	Siltstone	Medium grey, very hard, non calcareous, argillaceous, sandy fine grained quartz, very slightly carbonaceous.
65	2415.2	55	Sandstone	Light grey, fine to medium grained, poorly sorted, subrounded, firm, slightly calcareous, silty, moderately cemented, white clay matrix, slightly argillaceous - weathered volcanics in matrix?, no shows.
66	2405.0	50	Volcanics	Altered, light grey with light green and light brown patches, pseudocrystalline texture, clayey.
67	2397.6	20	Siltstone	Light grey, hard, non calcareous, argillaceous, slightly carbonaceous, white sandy laminations.
68	2392.6	15	Sandstone	Medium grey, very fine to fine grained, poorly sorted, subangular, firm, non calcareous, slightly silty, very carbonaceous with common laminae, well cemented; 10% patchy dull cream white fluorescence; dull cream white, very weak cut; residue not visible. C1 C2 C3 C4 C5 C6 77 137 132 51 42 18
69	2375.4	20	Sandstone	Light grey, very fine to fine grained, moderately sorted, subangular, firm, non calcareous, very slightly carbonaceous, well cemented but shattered; 20% patchy dull milky white fluorescence; mineral fluorescence.
70	2366.0	15	Siltstone	Medium grey, firm, non calcareous, very argillaceous, slightly carbonaceous.
71	2358.0	30	Sandstone	Very light grey, silty to very fine grained, moderately sorted, subangular, hard, moderately calcareous, very silty, white clay matrix, no shows.
72	2333.1	20	Siltstone	Medium grey, hard, non calcareous, argillaceous, slightly sandy, slightly carbonaceous, well cemented.
73	2309.2	20	Siltstone	Medium grey, firm, non calcareous, argillaceous, slightly carbonaceous, slightly micaceous.

74	2288.0	30	Shale	Grey to black, hard, non calcareous, very carbonaceous, coal laminae, slightly silty, subfissile.
75	2270.0	20	Siltstone/ Shale	Medium grey, firm, non calcareous, very carbonaceous with thin laminae; argillaceous, finely interlaminated.
76	2255.5	40	Siltstone	Medium grey, hard, non calcareous, argillaceous, slightly carbonaceous.
77	2226.0			No Recovery
78	2152.1	30	Shale	Medium grey, firm, non calcareous, silty, very slightly carbonaceous, subfissile.
79	2128.0	25	Siltstone	Medium grey, soft to firm, non calcareous, argillaceous.
80	2096.4	40	Shale	Dark grey, hard, non calcareous, very carbonaceous.
81	2070.1	50	Siltstone	Brown grey, hard, non calcareous, argillaceous, occasional carbonaceous laminae.
82	2035.0	25	Siltstone	Light grey, hard, non calcareous, argillaceous, cemented - silic?
83	2002.4	35	Shale	Light grey, hard, non calcareous, homogeneous.
84	1972.0	35	Shale	Very light grey, hard, non calcareous, slightly pyritic, homogeneous.
85	1950.5	40	Shale	Dark grey to black, hard, non calcareous, very carbonaceous, subfissile.
86	1925.1	20	Shale	White to very light grey, hard, slightly calcareous, slightly silty, slightly micaceous.
87	1909.1	30	Sandstone	Very light grey, very fine to fine grained, moderately sorted, subangular, firm, slightly calcareous, common white clay matrix, slightly silty, slightly micaceous, no shows.
88	1889.0	15	Shale	Brown grey, hard, non calcareous, slightly silty.
89	1881.0	40	Shale	Brown grey, hard, non calcareous, carbonaceous laminae, subfissile.
90	1873.0	40	Coal	Black, hard, shaly in part.
91	1858.2	20	Siltstone	Very light grey, firm, non calcareous, sandy, slightly micaceous.
92	1831.0	30	Sandstone	Very light grey, fine to medium grained, moderately sorted, subrounded, firm, non calcareous, well cemented, no shows.
93	1804.0	15	Shale	Medium grey, hard, non calcareous, slightly silty.

- 8 -

94	1787.0	30	Siltstone	Very light grey, firm, non calcareous, sandy, argillaceous.
95	1770.1	20	Shale	Very light grey, firm, non calcareous, slightly silty.
96	1742.6	15	Siltstone	Very light grey, hard, occasional carbonaceous laminae, non calcareous, argillaceous.
97	1715.2	20	Shale	Brown grey, firm, non calcareous, slightly silty, carbonaceous.
98	1688.6	30	Coal	Black, hard, shaly.
99	1662.2	30	Sandstone	Light grey, fine to medium grained, poorly sorted, subangular, firm, very slightly calcareous, slightly micaceous, slightly cemented, occasional carbonaceous lenses. No shows.
100	1648.1	20	Siltstone Shale	Brown grey, hard, non calcareous, sandy, slightly argillaceous; Dark brown grey, hard, non calcareous, very carbonaceous; finely interlaminated, grading to fine grained sandstone.
101	1614.6	35	Sandstone	Light grey, fine to coarse grained, poorly sorted, subangular, firm, non calcareous, slightly micaceous, slightly cemented, no shows.
102	1596.4	20	Siltstone	Brown grey, hard, non calcareous, argillaceous, slightly sandy, carbonaceous shale laminations.
103	1571.5	35	Sandstone	Medium grey, very fine grained, moderately sorted, subrounded, moderately friable, slightly calcareous, silty, no shows.
104	1553.6	40	Sandstone	Medium grey, very fine to fine grained, moderately sorted, subrounded, moderately friable, non calcareous, slightly silty, no shows.
105	1539.9	40	Sandstone	Brown grey, medium to very coarse grained, moderately sorted, subrounded, friable, non calcareous, slightly argillaceous, no shows.
106	1531.5	35	Shale	Brown grey, hard, non calcareous, slightly silty, silty laminae present.
107	1525.5	35	Siltstone	Brown grey, firm, non calcareous, argillaceous, sandy, grading to very fine grained sandstone, carbonaceous laminae present.
108	1520.1	25	Sandstone	Medium grey, very fine to fine grained, well sorted, subrounded, friable, non calcareous, slightly argillaceous, slightly micaceous, slightly carbonaceous; no shows.

109	1516.7	20	Sandstone	Medium grey, very fine to medium grained, moderately sorted, subrounded, friable, non calcareous, slightly argillaceous, no shows.
110	1515.0	35	Sandstone	Medium grey, very fine to coarse grained, poorly sorted, rounded to subrounded, friable, non calcareous, argillaceous, slightly silty, very slighty glauconitic, no shows.
111	1512.6	30	Sandstone	Medium grey, fine grained, very well sorted, rounded, friable, non calcareous, slightly argillaceous, slightly silty, no shows.
112	1510.9	45	Sandstone	Medium grey, fine to very coarse grained, poorly sorted, subangular to rounded, hard, non calcareous, argillaceous, slightly silty, pyritic, glauconite grains, no shows.
113	1509.0	15	Siltstone	Medium grey, moderately hard, moderately calcareous, sandy, very glauconitic, pyritic, argillaceous.
114	1507.0	55	Siltstone	Dark grey, firm, very calcareous, very glauconitic, pyritic, very argillaceous, slightly sandy - coarse quartz grains.
115	1505.0	50	Siltstone	Brown grey, hard, very calcareous, very glauconitic, slightly argillaceous, slightly sandy (quartz grains).
116	1503.0	55	Siltstone	Brown grey, hard, very calcareous, very glauconitic, glauconite pellets, slightly pyritic, very argillaceous.
117	1501.0	45	Siltstone	Brown grey, hard, very calcareous, very glauconitic, very argillaceous.
118	1499.3	50	Siltstone	Brown grey, hard, slightly calcareous, very glauconitic, very argillaceous, light brown grains.
119	1497.4	50	Shale	Dark brown grey, hard, very calcareous, slightly silty, slightly glauconitic.
120	1495.3	55	Siltstone	Dark brown grey, hard, very very calcareous, very argillaceous, glauconitic, slightly pyritic.
121	1493.3			Pulled Off
122	1491.5	45	Siltstone	Dark brown grey, hard, very very calcareous, very argillaceous, slightly pyritic.
123	1485.3	55	Shale	Dark brown grey, hard, very very calcareous, silty, slightly pyritic, very slightly glauconitic, light brown carbonate grains.
124	1480.3			Pulled Off
125	1475.4	55	Calcilutite	Medium grey, hard, very very calcareous, homogeneous.

- 10 -

126	1465.4	40	Calcilutite	Medium grey, very hard, very very calcareous, slightly silty.
127	1455.8	45	Calcilutite	Medium grey, very hard, very very calcareous, silty.
128	1445.4	50	Calcilutite	Medium grey, very hard, very very calcareous, slightly silty, occasional forams.
129	1435.7	45	Calcilutite	Medium grey, very hard, very very calcareous, very slightly silty.
130	1425.6	55	Calcilutite	Medium grey, hard, very very calcareous, slightly glauconitic, occasional forams and shell fragments.
131	1400.4	55	Calcilutite	Medium grey, very hard, very very calcareous, homogeneous.
132	1375.4	45	Calcilutite	Medium grey, very hard, very very calcareous, homogeneous.
133	3242.5			No Recovery
134	3241.9	12	Siltstone	Medium grey, firm, slightly calcareous, argillaceous, slightly carbonaceous, no crush cut.
135	3232.0			No Recovery, mud ball in bullet.
136	3222.0	20	Sandstone	Dark grey, fine to very fine grained, moderately well sorted, subangular to subrounded, firm, slightly calcareous, very carbonaceous, micromicaceous, argillaceous, silty; 5% spotty very dull yellow fluorescence, slow moderately bright yellow cut; parallel laminations defined by alternating sandstone/carbonaceous layers, moderate crush cut.
137	3219.3	20	Sandstone Siltstone	Light grey, very fine grained, moderately well sorted, subangular to subrounded, firm, slightly calcareous, very carbonaceous, micromicaceous; Dark grey, argillaceous, micaceous, carbonaceous; 5% spotty dull yellow fluorescence, slow moderately bright yellow cut; parallel laminations of sandstone and siltstone, moderate crush cut.
138	3211.3	15	Sandstone	Light grey, very fine to medium grained, poorly sorted, subangular to subrounded, soft, slightly calcareous, sucrosic, silica cement, very carbonaceous; 80% even moderately bright yellow fluorescence, slow moderately bright yellow cut, faint ring light brown cut, moderate to poor crush cut.
139	3177.0	14	Sandstone	Light grey, fine to very fine grained, poorly sorted, subangular to subrounded, soft, slightly calcareous, sucrosic silica cement, slightly carbonaceous, slightly argillaceous; 90% even dull yellow fluorescence, very poor crush cut.



140	3159.2	20	Siltstone	Dark grey, firm, slightly sandy (very fine grained), micromicaceous, argillaceous, very slight crush cut.
141	3141.0	20	Conglomerate	Light grey, fine to very coarse grained, very poorly sorted, angular to subangular, firm, slightly calcareous, siltstone lithics in sandstone matrix; 90% spotty to patchy bright yellow fluorescence, slow moderately bright yellow cut, faint ring of pale brown residue, moderate crush cut, siltstone lithics approximately 1mm.
142	3132.8	17	Siltstone	Medium dark grey, firm, very argillaceous, micromicaceous, no crush cut.
143	3127.4	11	Siltstone	Light grey, firm, micromicaceous, argillaceous, no crush cut.
144	3116.0	8	Siltstone	Dark grey, hard, micromicaceous, water sensitive, argillaceous, no crush cut.
145	3107.9	25	Siltstone	Medium light grey, firm, sandy (very fine grained), very carbonaceous, argillaceous, no crush cut.
146	3105.0	9	Volcanic	Medium light grey, hard, altered, minor crystalline grains, mostly altered to clay, some green and clear crystals.
147	3097.0	8	Siltstone	Medium dark grey, firm, micromicaceous, slightly carbonaceous, no crush cut.
148	3093.0			No Recovery
149	3088.6	12	Siltstone	Medium dark grey, firm, micromicaceous, slightly carbonaceous, no crush cut.
150	3088.0	10	Siltstone	Medium dark grey, firm, very argillaceous, carbonaceous, slightly sandy, no crush cut.
151	3081.5	15	Conglomerate	Light grey, fine to very coarse, very poorly sorted, angular to subangular, slightly calcareous, siltstone lithics in sandstone matrix; 90% patchy bright yellow fluorescence, slow moderately bright yellow cut, faint film of light brown residue; moderate crush cut, some sandstone lithics, sucrosic silica cement.
152	3062.4	22	Conglomerate	Light grey, fine to coarse grained, very poorly sorted, angular to subangular, firm, slightly calcareous, siltstone and sandstone lithics in sandstone matrix; 30% patchy moderately bright yellow fluorescence, slow moderately bright yellow cut, moderate crush cut, 1 pebble (sandstone) 5mm x 12mm.

153	3054.5	17	Conglomerate	Light grey, fine to very coarse grained, very poorly sorted, angular to subangular, firm, slightly calcareous, siltstone and sandstone lithics in sandstone matrix; 60% patchy moderately bright yellow fluorescence, slow moderately bright yellow cut, moderate crush cut, 1 pebble (sandstone) 6mm across.
154	3051.8	24	Siltstone	Medium dark grey, firm, slightly calcareous, micromicaceous, argillaceous, slightly carbonaceous, microlaminations, no crush cut.
155	3039.0	18	Conglomerate	Light grey, fine to very coarse grained, very poorly sorted, subangular to angular, firm, slightly calcareous, siltstone and sandstone lithics in sandstone matrix; 50% patchy moderately bright to dull yellow fluorescence, very slow moderately bright yellow cut, moderate crush cut, rare light green lithics.
156	3026.4	16	Siltstone	Medium dark grey, firm, sandy, micromicaceous, very carbonaceous, slight crush cut.
157	3013.9			Shot Off
158	3002.0	8	Conglomerate	Light grey, fine to very coarse grained, very poorly sorted, angular, firm, slightly calcareous, slightly pyritic, sandstone lithics in sandstone matrix; 5% patchy (lithics only) moderately bright yellow fluorescence, very slow dull yellow cut; poor crush cut, pure white quartzite lithics.
159	2994.4	14	Siltstone	Dark grey, firm to hard, very argillaceous, micromicaceous, no crush cut.
160	2978.2	23	Conglomerate	Light grey, fine to very coarse grained, very poorly sorted, angular to subangular, firm, slightly calcareous, siltstone and sandstone lithics in a sandstone matrix; 30% patchy dull yellow fluorescence, very slow crush cut, 4mm x 8mm siltstone clast, well rounded.
161	2971.8	10	Siltstone	Dark grey, soft, very argillaceous, slightly carbonaceous, micromicaceous, no crush cut, slightly sandy.
162	2961.0	24	Conglomerate	Dark to light grey, fine to very coarse grained, very poorly sorted, angular, soft, slightly calcareous, sandstone and siltstone lithics in sandstone matrix; 5% patchy bright yellow/green fluorescence, moderately fast bright yellow cut, mottled, mostly clasts, one very pyritic clast.

APPENDIX 4

APPENDIX 4

VELOCITY SURVEY REPORT

VELOCITY SURVEY REPORT

1. Marine velocity survey data
2. Processing report
3. Schlumberger check shot field report
4. Gun geometry sketch
5. Check shot data
6. Drift calculation sheet
7. Sonic calibration curve
8. Time-Depth curve
9. Schlumberger seismic calibration curve and log
10. Schlumberger geogram
11. Schlumberger vertical seismic profile plots
12. Raw shot data

1. MARINE VELOCITY SURVEY DATA

WELL : Wirrah #3

BASIN : Gippsland

DATE OF SURVEY : 20.1.84

CONTRACTOR : Schlumberger

RECORDED BY : S. Baker

WITNESSED BY : S. Lee

WATER DEPTH : 49 metres

R.T. ELEVATION : 21 metres

T.D. WHEN SHOT : 3300 metres KB

CASING DEPTHS : 20" 193 metres KB  
13<sup>3</sup>/<sub>8</sub>" 870 metres KB

NO. OF SHOOTING LEVELS : 77

2. PROCESSING REPORT

WIRRAH-3

Processing Parameters

Seismic Reference Datum (SRD)	:	Mean Sea Level
Elevation SRD	:	0 metres
Elevation Kelly Bushing	:	21 metres
Elevation Ground Level	:	-49 metres
Well Deviation	:	0 degrees
Total Depth	:	3257 metres KB
Sonic Log Interval	:	3255 - 210 metres KB
Density Log Interval	:	3255 - 840 metres KB

Data Processing Information

Open Hole Logs

Sonic (3255-210m) and density (3255-840m) logs were used in the construction of the seismogram.

Correction to Datum

The seismic reference datum is at Mean Sea Level. The airgun and hydrophone were positioned 3 metres and 6.3 metres below MSL, respectively. A velocity of 1480 m/s was used to correct the shot times from gun to G.L. The offset distance was calculated using a moonpool shot with a travel time of 30.9 ms and a velocity of 1480 ms for water. The calculated distance was 45.7 metres and the total correction was 2.06 ms.

Velocity Modelling

An interval of 1480 m/s has been used between MSL and G.L. The velocity from G.L. to geophone was derived from the check shots.

Sonic Calibration Results

The top of the sonic log was chosen as the origin for the calibration drift curve. All drift measurements are relative to this point.

Interval Velocities

Interval velocities have been calculated and displayed using MSL and check shot levels.



Shot Data

<u>Level Depth</u> (m KB)	<u>Stacked Shots</u>	<u>Rejected Shots</u>	<u>Quality</u>	<u>Comment</u>
3253	3	3	Poor	
3246	6	4	Fair	
2959	3	10	Fair	
2943	8	2	Fair	
2920	7	4	Good	
2900	8	2	Good	
2875	7	3	Good	
2850	15	24	Good	
2825	2	4	Good	
2800	7	3	Good	
2775	6	13	Good	
2750	10	2	Good	
2725	9	1	Good	
2700	9	1	Good	
2675	7	3	Good	
2650	9	1	Good	
2625	12	7	Good	
2600	6	-	Good	
2575	9	1	Good	
2550	6	3	Good	
2525	5	4	Good	
2500	3	4	Good	
2475	7	-	Good	
2450	4	5	Good	
2425	4	5	Good	
2400	4	7	Good	
2375	8	1	Good	
2350	5	2	Good	
2325	9	-	Good	
2300	5	4	Good	
2275	8	4	Good	
2250	5	2	Good	
2225	4	3	Good	
2200	3	5	Good	
2175	3	6	Good	
2150	4	3	Good	
2125	3	2	Good	

<u>Level Depth</u> (m KB)	<u>Stacked Shots</u>	<u>Rejected Shots</u>	<u>Quality</u>	<u>Comment</u>
2100	1	5	Good	
2075	5	1	Good	
2050	2	3	Good	
2025	4	4	Good	
2000	5	3	Good	
1975	4	2	Good	
1950	3	5	Good	
1925	6	-	Good	
1900	6	1	Good	
1885	-	3	Poor	
1870	6	3	Good	
1850	5	-	Good	
1825	5	-	Good	
1800	9	-	Good	
1775	5	1	Good	
1750	5	1	Good	
1725	7	-	Good	
1700	4	2	Good	
1680	5	-	Good	
1660	5	2	Good	
1640	5	-	Good	
1620	5	-	Good	
1600	5	-	Good	
1575	5	-	Good	
1550	5	1	Good	
1525	5	-	Good	
1500	6	-	Good	
1480	5	-	Good	
1463	5	-	Good	
1445	5	-	Good	
1427	5	-	Good	
1411	5	-	Good	
1400	5	1	Good	
1300	2	1	Good	
1150	3	-	Good	
1000	4	-	Good	
868	3	2	Good	
855	3	2	Good	
600	3	-	Good	
300	6	7	Good	
0	3	4	Good	



**WELL SEISMIC SERVICE FIELD REPORT**

Schlumberger

COMPANY	WELL	DATE	LOCATION	ENGINEER	WITNESSED BY
SSO	WIRRAH #3	20.1.84	SEA	S. BAKER	J. LEE
FEEET <input type="checkbox"/> METRES <input checked="" type="checkbox"/>	JACK UP <input type="checkbox"/> PLATFORM <input type="checkbox"/>	SHIP <input type="checkbox"/> SEMI-SUB <input checked="" type="checkbox"/>	WEATHER:		

SCHLUMBERGER ZERO KB	AT ELEVATION	21.0m	RELATIVE TO MEAN SEA LEVEL (M.S.L.)
LOG MEASURED FROM KB	AT ELEVATION	0	RELATIVE TO SCHLUMBERGER ZERO
DRILLING MEASURED FROM KB	AT ELEVATION	0	RELATIVE TO SCHLUMBERGER ZERO

<b>SOURCE</b>		<b>TIDEL INFORMATION</b>		DISTANCE	HOUR	DATE
GUN TYPE	WATER <input type="checkbox"/> AIR <input checked="" type="checkbox"/>	TIDE LEVEL TO M.S.L.	(RECORD IF LEVEL VARIES MORE THAN 2 METRES DURING SURVEY)			
VOLUME	1 x 200 CU INCHES					
PRESSURE	140 BARS					
VIBRATOR TYPE						
SWEEP LENGTH	SECONDS					
FROM	HZ TO	CSU SOFTWARE VERSION: 24	MAX. HOLE DEV:	AZIM:		

NOTE: SHOTS HIGHLY RECOMMENDED AT TD, TOP EACH SONIC, ABOVE AND BELOW BAD HOLE INTERVALS

**UNCORRECTED RESULTS**

Quality: G = Good, P = Poor, U = Unsatisfactory

Stack NO.	DEPTH	GUN PRESSURE	FILTERS	TRANSIT TIME	HOUR SHOT	FILE	Reel STACK	STACKED SHOTS	QUALITY / REMARKS
	2787.5					3	1	2-5	Test shot only
	3253					6	1	6-12	Noisy
	3246					9	1	13-20	Noisy
2	3246					11	1	29-30	
	3246			1011.8		12	1	31-39	
3	2959			959.8		12	1	40-49	
4	2959			900.0		12	1	50-52	
5	2943			956.2		12	1	53-62	
6	2920			950.4		12	1	63-73	
7	2900			946.6		12	1	74-83	
8	2575			939.5		12	1	85-94	
9	2850			937.0		12	1	103-111	
10	2850			935.4		12	1	115-123	
11	2825			929.4		13	1	132-140	
12	2800			924.2		13	1	141-150	
13	2775			918.4		13	1	151-160	
14	2775			917.1		13	1	161-169	
15	2750			911.9		13	1	172-181	
16	2725			904.5		13	1	183-191	
17	2700			899.5		13	1	192-201	
18	2675			893.8		13	1	202-211	
19	2650			887.8		13	1	212-221	
20	2625			882.1		13	1	222-231	
21	2625			881.5		13	1	233-237	



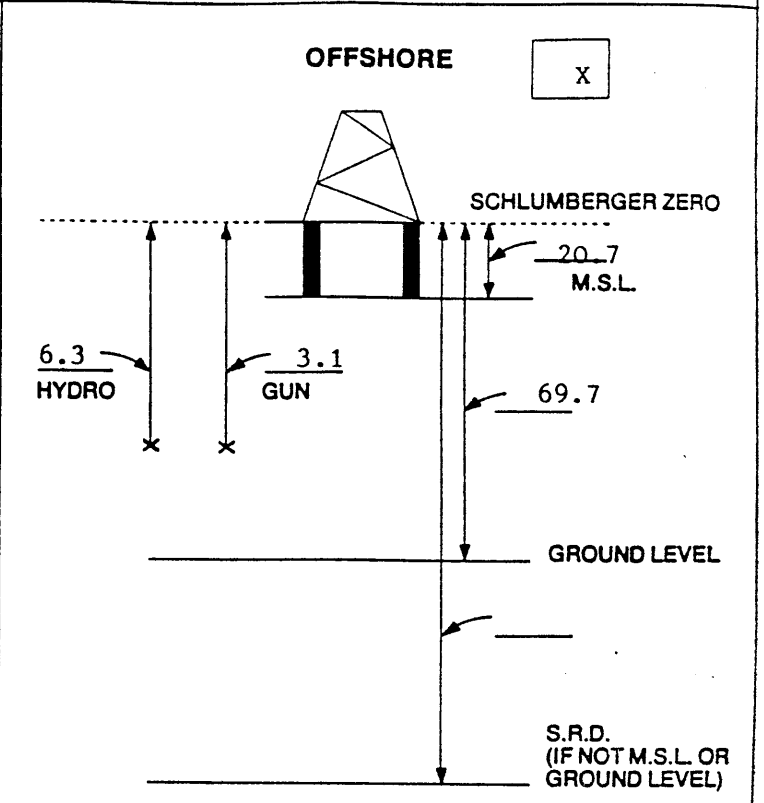
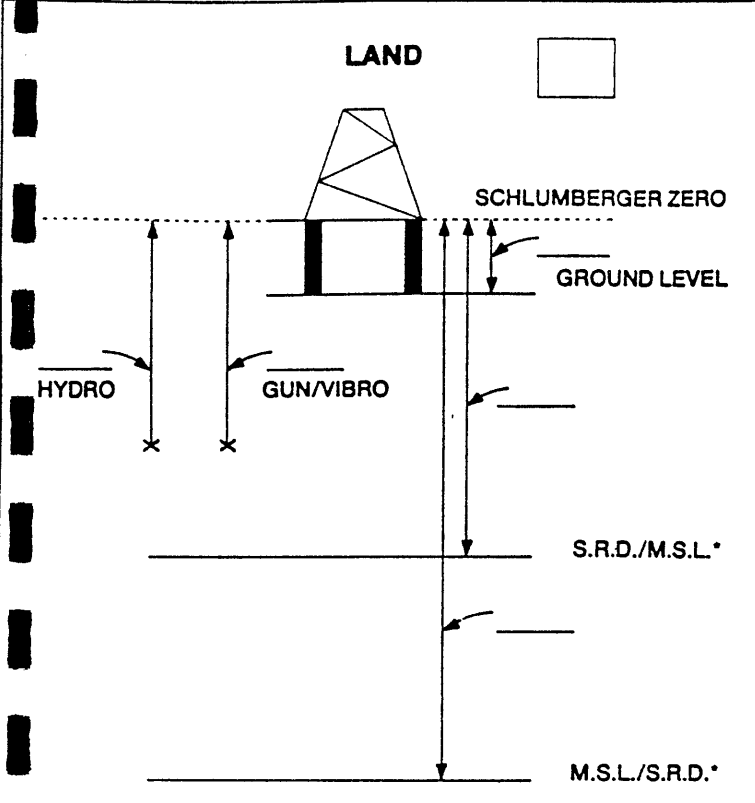




Schlumberger

4. GUN GEOMETRY SKETCH

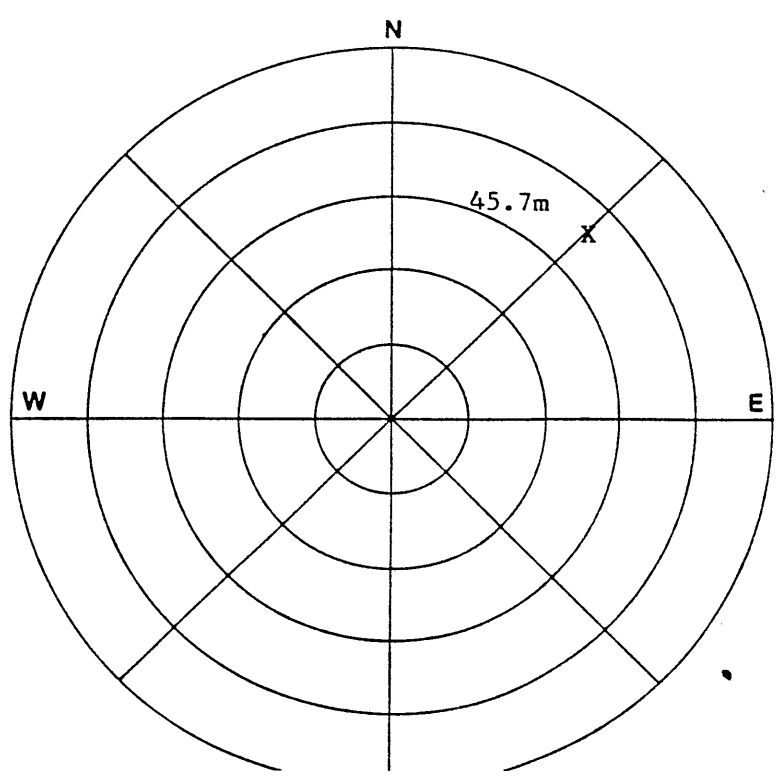
CLIENT: ESSO WELL: WIRRAH #3 DATE: 19-22.1.84



INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO  
\* DELETE AS APPLICABLE

INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO

SHOT POS'N	GUN OFFSET	HYDRO OFFSET	GUN DEPTH	HYDRO DEPTH
1	45.72	45.72	3.0	6.3
	AZIMUTH			
	X	570717		
	Y	5772001		





5. CHECK SHOT DATA - WIRRAH-3

<u>LEVEL</u> <u>NUMBER</u>	<u>MEASURED</u> <u>DEPTH</u> FROM KB (m)	<u>VERTICAL</u> <u>DEPTH</u> FROM MSL (m)	<u>OBSERVED</u> <u>TRAVEL</u> TIME (ms)	<u>VERTICAL</u> <u>TRAVEL</u> TIME MSL/ GEOPHONE (ms)	<u>AVERAGE</u> <u>VELOCITY</u> MSL/GEOPHONE (m/s)	<u>DELTA</u> <u>DEPTH</u> BETWEEN SHOTS (m)	<u>DELTA</u> <u>TIME</u> BETWEEN SHOTS (ms)	<u>INTERVAL</u> <u>VELOCITY</u> BETWEEN SHOTS (m/s)
1	70.00	49.00	49.00	34.67	1413	230.00	99.78	2305
2	300.00	279.00	132.00	134.45	2075	300.00	123.00	2439
3	600.00	579.00	254.00	257.45	2249	255.00	84.29	3025
4	855.00	834.00	338.00	341.74	2440	13.00	7.01	1856
5	868.00	847.00	345.00	348.75	2429	132.00	44.08	2995
6	1000.00	979.00	389.00	392.83	2492	150.00	47.07	3187
7	1150.00	1129.00	436.00	439.90	2567	150.00	49.05	3058
8	1300.00	1279.00	485.00	488.94	2616	100.00	39.02	2563
9	1400.00	1379.00	524.00	527.97	2612	11.00	4.00	2748
10	1411.00	1390.00	528.00	531.97	2613	16.00	6.00	2665
11	1427.00	1406.00	534.00	537.97	2614	18.00	7.00	2570
12	1445.00	1424.00	541.00	544.98	2613	18.00	7.00	2570
13	1463.00	2442.00	548.00	551.98	2612	17.00	10.00	1700
14	1480.00	1459.00	558.00	561.98	2596	20.00	4.01	4993
15	1500.00	1479.00	562.00	565.99	2613	25.00	8.01	3123
16	1525.00	1504.00	570.00	573.99	2620	25.00	8.01	3123
17	1550.00	1529.00	578.00	582.00	2627	25.00	7.01	3569
18	1575.00	1554.00	585.00	589.00	2638	25.00	8.00	3123
19	1600.00	1579.00	593.00	597.01	2645	20.00	8.00	2499
20	1620.00	1599.00	601.00	605.01	2643	20.00	5.00	3997
21	1640.00	1619.00	606.00	610.01	2654	20.00	8.00	2499
22	1660.00	1639.00	614.00	618.01	2652	20.00	6.00	3311
23	1680.00	1659.00	620.00	624.02	2659	20.00	8.00	2499
24	1700.00	1679.00	628.00	632.02	2657	25.00	10.00	2499
25	1725.00	1704.00	638.00	642.03	2654	25.00	7.00	3569
26	1750.00	1729.00	645.00	649.03	2664	25.00	7.00	3569
27	1775.00	1754.00	652.00	656.03	2674	25.00	2.01	12466
28	1800.00	1779.00	654.00	658.04	2703	25.00	11.00	2272
29	1825.00	1804.00	665.00	669.04	2696	25.00	7.00	3570
30	1850.00	1829.00	672.00	676.05	2705	20.00	5.00	3998
31	1870.00	1849.00	677.00	681.05	2715	15.00	11.00	1364
32	1885.00	1864.00	688.00	692.05	269	40.00	8.01	4996

2717

3100

3333

2895

143/

WIRRAH-3

WELL COMPLETION REPORT

VOLUME 1

CONTENTS

- 1. Well Data Record
- 2. Operations Summary
- 3. Casing Data
- 4. Cement Data
- 5. Samples, Conventional Cores, Sidewall Cores
- 6. Wireline Logs and Surveys
- 7. Summary of Formation Test Program
- 8. Summary of Production Test Program
- 9. Temperature Record

FIGURES

- 1. Locality Map
- 2. Well Progress Curve
- 3. Well Bore Schematic
- 4. Abandonment Schematic
- 5. Horner Temperature Plots

APPENDICES

- 1. Lithological Descriptions
- 2. Core Descriptions
- 3. Sidewall Core Descriptions
- 4. Velocity Survey Report

CHECK SHOT DATA - WIRRAH-3

<u>LEVEL NUMBER</u>	<u>MEASURED DEPTH FROM KB (m)</u>	<u>VERTICAL DEPTH FROM MSL (m)</u>	<u>OBSERVED TRAVEL TIME (ms)</u>	<u>VERTICAL TRAVEL TIME MSL/ GEOPHONE (ms)</u>	<u>AVERAGE VELOCITY MSL/GEOPHONE (m/s)</u>	<u>DELTA DEPTH BETWEEN SHOTS (m)</u>	<u>DELTA TIME BETWEEN SHOTS (ms)</u>	<u>INTERVAL VELOCITY BETWEEN SHOTS (m/s)</u>
33	1925.00	1904.00	696.00	700.05	2720	25.00	10.00	2499
34	1950.00	1929.00	706.00	710.06	2717	25.00	7.00	3570
35	1975.00	1954.00	713.00	717.06	2725	25.00	6.00	4164
36	2000.00	1979.00	719.00	723.06	2737	25.00	8.00	3124
37	2025.00	2004.00	727.00	731.07	2741	25.00	8.00	3124
38	2050.00	2029.00	735.00	739.07	2745	25.00	7.00	3570
39	2075.00	2054.00	742.00	746.07	2753	25.00	7.00	3570
40	2100.00	2079.00	749.00	753.07	2761	25.00	7.00	3570
41	2125.00	2104.00	756.00	760.08	2768	25.00	6.00	4165
42	2150.00	2129.00	762.00	766.08	2779	25.00	6.00	4165
43	2175.00	2154.00	768.00	772.08	2790	25.00	6.00	4165
44	2200.00	2179.00	774.00	778.09	2800	25.00	6.00	4165
45	2225.00	2204.00	780.00	784.09	2811	25.00	6.00	4165
46	2250.00	2029.00	786.00	790.09	2821	25.00	8.00	3124
47	2275.00	2054.00	794.00	798.09	2824	25.00	6.00	4165
48	2300.00	2079.00	800.00	804.10	2834			
49	2325.00	2304.00	806.00	810.10	2844	25.00	7.00	3570
50	2350.00	2329.00	813.00	817.10	2850	25.00	8.00	3124
51	2375.00	2354.00	821.00	825.10	2853	25.00	1.00	24920
52	2400.00	2379.00	822.00	826.10	2880	25.00	7.00	3570
53	2425.00	2404.00	829.00	833.11	2886	25.00	8.00	3124
54	2450.00	2429.00	837.00	841.11	2888	25.00	6.00	4165
55	2475.00	2454.00	843.00	847.11	2897	25.00	6.00	4165
56	2500.00	2479.00	849.00	853.11	2906	25.00	6.00	4165
57	2525.00	2504.00	855.00	859.11	2915	25.00	6.00	4165
58	2550.00	2529.00	861.00	865.12	2923	25.00	5.00	4998
59	2575.00	2554.00	866.00	870.12	2935	25.00	7.00	3571
60	2600.00	2579.00	873.00	877.12	2940	25.00	5.00	4998
61	2625.00	2604.00	878.00	882.12	2952	25.00	8.00	3124
62	2650.00	2629.00	886.00	890.12	2954	25.00	7.00	3571
63	2675.00	2654.00	893.00	897.12	2958	25.00	5.00	4998

3226  
3659  
3906  
4546  
3704  
4167  
4000

CHECK SHOT DATA - WIRRAH-3

<u>LEVEL</u> <u>NUMBER</u>	<u>MEASURED</u> <u>DEPTH</u> FROM KB (m)	<u>VERTICAL</u> <u>DEPTH</u> FROM MSL (m)	<u>OBSERVED</u> <u>TRAVEL</u> TIME (ms)	<u>VERTICAL</u> <u>TRAVEL</u> TIME MSL/ GEOPHONE (ms)	<u>AVERAGE</u> <u>VELOCITY</u> MSL/GEOPHONE (m/s)	<u>DELTA</u> <u>DEPTH</u> BETWEEN SHOTS (m)	<u>DELTA</u> <u>TIME</u> BETWEEN SHOTS (ms)	<u>INTERVAL</u> <u>VELOCITY</u> BETWEEN SHOTS (m/s)	
64	2700.00	2679.00	898.00	902.13	2970	25.00	6.00	4166	4000
65	2725.00	2704.00	904.00	908.13	2978	25.00	7.00	3571	
66	2750.00	2729.00	911.00	915.13	2982	25.00	6.00	4166	
67	2775.00	2754.00	917.00	921.13	2990	25.00	6.00	4166	
68	2800.00	2779.00	923.00	927.13	2997	25.00	6.00	4166	4543
69	2825.00	2804.00	929.00	933.13	3005	25.00	3.00	8328	
70	2850.00	2829.00	932.00	936.13	3022	25.00	8.00	3125	
71	2875.00	2854.00	940.00	944.14	3023	25.00	4.00	6247	
72	2900.00	2879.00	944.00	948.14	3036	20.00	6.00	3333	
73	2920.00	2899.00	950.00	954.14	3038	23.00	4.00	5748	
74	2943.00	2922.00	954.00	958.14	3050	16.00	4.00	3999	
75	2959.00	2938.00	958.00	962.14	3054	287.00	56.01	5124	
76	3246.00	3225.00	1014.00	1018.15	3167	7.00	3.00	2333	
77	3253.00	3232.00	1017.00	1021.15	3165				

6. DRIFT CALCULATION SHEET

WIRRAH-3

Level No.	Measured Depth from KB (m)	Vertical Depth from MSL (m)	Vertical Travel Time MSL/Geophone (ms)	Integrated Raw Sonic Time (ms)	Computed Drift at level (ms)	Computed Blk-Shft Correction (us/F)
1	70.00	49.00	34.67	34.67	0	0
2	210.00	189.00	95.41	95.41	0	0
3	300.00	279.00	134.45	135.59	-1.13	-3.84
4	600.00	579.00	257.45	248.24	9.21	10.51
5	855.00	834.00	341.74	331.36	10.38	1.39
6	868.00	847.00	348.75	335.60	13.15	64.95
7	1000.00	979.00	392.83	378.78	14.05	2.07
8	1150.00	1129.00	439.90	421.83	18.06	8.16
9	1300.00	1279.00	488.94	470.14	18.81	1.51
10	1400.00	1379.00	527.97	509.46	18.51	-0.91
11	1411.00	1390.00	531.97	514.22	17.75	-21.10
12	1427.00	1406.00	537.97	521.16	16.82	-17.74
13	1445.00	1424.00	544.98	528.02	16.95	2.34
14	1463.00	1442.00	551.98	535.16	16.82	-2.28
15	1480.00	1459.00	561.98	542.12	19.86	54.49
16	1500.00	1479.00	565.99	549.49	16.50	-51.26
17	1525.00	1504.00	573.99	558.09	15.91	-7.20
18	1550.00	1529.00	582.00	565.92	16.07	2.03
19	1575.00	1554.00	589.00	573.60	15.41	-8.13
20	1600.00	1579.00	597.01	581.10	15.91	6.15
21	1620.00	1599.00	605.01	588.00	17.01	16.75
22	1640.00	1619.00	610.01	593.80	16.21	-12.14
23	1660.00	1639.00	618.02	600.58	17.44	18.71
24	1680.00	1659.00	624.02	606.62	17.40	-0.63
25	1700.00	1679.00	632.02	615.08	16.94	-6.97
26	1725.00	1704.00	642.03	623.29	18.74	21.94
27	1750.00	1729.00	649.03	630.70	18.33	-5.00
28	1775.00	1754.00	656.03	637.10	18.94	7.41
29	1800.00	1779.00	658.04	644.46	13.58	-65.27
30	1825.00	1804.00	669.04	650.00	19.04	66.50
31	1850.00	1829.00	676.05	656.70	19.35	3.77
32	1870.00	1849.00	681.05	662.12	18.93	-6.40
33	1885.00	1864.00	692.05	668.18	23.86	100.33
34	1925.00	1904.00	700.05	680.64	19.42	-33.91
35	1950.00	1929.00	710.06	688.86	21.20	21.72

## DRIFT CALCULATION SHEET

WIRRAH-3

Level No.	Measured Depth from KB (m)	Vertical Depth from MSL (m)	Vertical Travel Time MSL/Geophone (ms)	Integrated Raw Sonic Time (ms)	Computed Drift at level (ms)	Computed Blk-Shft Correction (us/F)
36	1975.00	1954.00	717.06	696.43	20.64	-6.85
37	2000.00	1979.00	723.06	703.83	19.23	-17.12
38	2025.00	2004.00	731.07	711.20	19.87	7.75
39	2050.00	2029.00	739.07	717.89	21.18	15.95
40	2075.00	2054.00	746.07	724.87	21.20	0.34
41	2100.00	2079.00	753.07	731.75	21.32	1.46
42	2125.00	2104.00	760.08	738.43	21.65	3.92
43	2150.00	2129.00	766.08	745.03	21.05	-7.30
44	2175.00	2154.00	772.08	751.27	20.81	-2.88
45	2200.00	2179.00	778.09	757.90	20.19	-7.60
46	2225.00	2204.00	784.09	764.16	19.92	-3.22
47	2250.00	2229.00	790.09	770.54	19.56	-4.49
48	2275.00	2254.00	798.09	776.62	21.47	23.34
49	2300.00	2279.00	804.10	782.80	21.29	-2.19
50	2325.00	2304.00	810.10	789.24	20.86	-5.23
51	2350.00	2329.00	817.10	795.97	21.12	-3.21
52	2375.00	2354.00	825.10	802.47	22.64	18.41
53	2400.00	2379.00	826.10	808.33	17.78	-59.22
54	2425.00	2404.00	838.11	814.71	18.40	7.52
55	2450.00	2429.00	841.11	820.34	20.77	28.96
56	2475.00	2454.00	847.11	826.02	21.09	3.93
57	2500.00	2479.00	853.11	831.74	21.37	3.39
58	2525.00	2504.00	859.11	837.75	21.36	-0.08
59	2550.00	2529.00	865.12	843.84	21.28	-1.04
60	2575.00	2554.00	870.12	849.61	20.50	-9.44
61	2600.00	2579.00	877.12	855.69	21.43	11.23
62	2625.00	2604.00	882.12	861.88	20.24	-14.48
63	2650.00	2629.00	890.12	867.75	22.37	25.96
64	2675.00	2654.00	879.12	873.96	23.16	9.66
65	2700.00	2679.00	902.13	879.93	22.19	-11.79
66	2725.00	2704.00	908.13	886.11	22.02	-2.13
67	2750.00	2729.00	915.13	892.32	22.81	9.63
68	2775.00	2754.00	921.13	898.56	22.57	-2.88
69	2800.00	2779.00	927.13	904.53	22.60	-0.39

DRIFT CALCULATION SHEET

WIRRAH-3

Level No.	Measured Depth from KB (m)	Vertical Depth from MSL (m)	Vertical Travel Time MSL/Geophone (ms)	Integrated Raw Sonic (ms) Time (ms)	Computed Drift at level (ms)	Computed Blk-Shft Correction (us/F)
70	2825.00	2804.00	933.13	910.60	22.53	-0.87
71	2850.00	2829.00	936.13	916.30	19.83	-32.90
72	2875.00	2854.00	944.14	922.17	21.97	26.05
73	2900.00	2879.00	948.14	927.79	20.35	-19.80
74	2920.00	2899.00	954.14	932.25	21.88	23.44
75	2943.00	2922.00	958.14	937.69	20.45	-18.98
76	2959.00	2938.00	962.14	941.49	20.65	3.85
77	3246.00	3225.00	1018.15	1002.20	15.96	-4.99
78	3253.00	3232.00	1021.15	1003.55	17.60	71.64
79	3255.00	3234.00	1021.55	1003.94	17.60	0

PE902505

This is an enclosure indicator page.  
The enclosure PE902505 is enclosed within the  
container PE902504 at this location in this  
document.

The enclosure PE902505 has the following characteristics:

- ITEM\_BARCODE = PE902505
- CONTAINER\_BARCODE = PE902504
  - NAME = Time Depth Curve
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L2
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Time Depth Curve (enclosure from WCR  
vol.1) for Wirrah-3
- REMARKS =
- DATE\_CREATED = 10/08/84
- DATE\_RECEIVED = 29/11/85
  - W\_NO = W840
  - WELL\_NAME = Wirrah-3
- CONTRACTOR =
- CLIENT\_OP\_CO = ESSO EXPLORATION AND PRODUCTION

(Inserted by DNRE - Vic Govt Mines Dept)



BASIC

TABLE 1

SUMMARY OF PALAEOBIOLOGICAL ANALYSIS, WIRRAH-3, GIPPSLAND BASIN  
BASIC DATA

NATURE OF SAMPLE	DEPTH (mKB)	PLANKTONIC FORAMINIFERAL YIELD	PRESERVATION	PLANKTONIC FORAMINIFERAL DIVERSITY
SWC 113	1509.0	Barren	-	-
SWC 114	1507.0	Barren	-	-
SWC 115	1505.0	Barren	-	-
SWC 116	1503.0	Barren	-	-
SWC 117	1501.0	Very low	Poor	Very low
SWC 118	1499.3	Barren	-	-
SWC 119	1497.4	Barren	-	-
SWC 120	1495.3	Low	Moderate/Poor	Low
SWC 122	1491.5	High	Good	Moderate
SWC 123	1485.3	Low	Good	Low
SWC 125	1475.4	High	Good	Moderate
SWC 126	1465.4	High	Good	Moderate
SWC 127	1455.8	Moderate	Moderate	Moderate/High
SWC 128	1445.4	High	Good	Moderate/High
SWC 129	1435.7	Moderate/High	Moderate	Moderate
SWC 130	1425.6	High	Good	High
SWC 131	1400.4	Moderate	Good	Moderate
SWC 132	1375.4	High	Good	High



TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		CONFIDENCE RATING	COMMENTS
			SPORE POLLEN	LITHOLOGY		
SWC 125	1475.4	Good	V. low	Calclut.	0	<u>C. annulata</u>
SWC 123	1485.3	V. good	Low	Sh., calc.	-	Misplaced sample containing <u>R. trophus</u> & <u>T. magnificus</u> (Middle <u>N. asperus</u> Zone Indicator species).
SWC 122	1491.5	V. good	Low	Sist., calc., glau.	-	Early Oligocene forami assemblage with reworked glauconite and Upper-Middle <u>N. asperus</u> palynoflora.
SWC 120	1495.3	V. good	Fair	S.st., glau.	1	<u>V. extensa</u> .
SWC 119	1497.4	Good	Fair	Sh., glau.	2	<u>S. punctatus</u> , <u>P. reticulatus</u> .
SWC 118	1499.3	Good	Fair	Sist., glau.	1	<u>V. extensa</u> frequent, <u>M. verrucosus</u> .
SWC 117	1501.0	Good	V. low	Sist., glau.	1	<u>V. extensa</u> .
SWC 116	1503.0	Good	High	Sist., glau.	0	<u>T. magnificus</u> , <u>R. trophus</u> , <u>P. recavus</u> , <u>V. extensa</u> .
SWC 115	1505.0	Good	Fair	Sist., glau.	0	<u>T. magnificus</u> , frequent <u>V. extensa</u> .
SWC 114	1507.0	Good	Fair	Sist., glau.	0	<u>T. magnificus</u> , <u>P. pachypolus</u> , <u>P. rectomarginis</u> , <u>V. extensa</u>
SWC 113	1509.9	Negligible		Sist., glau.	-	
SWC 112	1510.9	Barren		Ss.	-	
SWC 111	1512.9	Barren		Ss.	-	
SWC 110	1515.0	V. low	V. low	Ss.		<u>B. elegansiformis</u> .
SWC 109	1516.7	V. low	V. low	Ss.	-	
SWC 108	1520.1	Fair	Fair	Ss.	2	<u>N. falcatus</u> , <u>V. attenuatus</u> .
SWC 107	1525.5	Good	Low	Sist., carb.	2	<u>N. falcatus</u> .

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
		YIELD	SPORE POLLEN			
SWC 106	1531.5	V. low	V. low	Sh.	2	<u>N.falcatus.</u>
SWC 105	1539.9	Barren		Ss.	-	
SWC 104	1553.6	Low	Fair	Ss.	1	<u>T.leuros, P.vesicus, N.falcatus</u>
SWC 103	1571.5	V. low	Low	Ss.	1	<u>T.leuros, N.falcatus, A.diktyoplokus</u>
SWC 102	1596.4			Slst., carb.	1	<u>T.leuros, T.dellicatus, N.falcatus, P.pachypolus, P.recavus</u>
SWC 101	1614.6	Negligible		Ss.	-	
SWC 100	1648.1	Low	Low	Slst.	2	<u>P.reflexus, frequent Nothofagidites</u>
SWC 99	1662.2	Negligible		Ss.		<u>P.asperopolus</u>
SWC 98	1688.2	Fair	Fair	Coal	2	<u>P.rugulatus, abundant Proteacidites</u>
SWC 97	1715.2	Good	High	Sh., carb.	0	<u>P.asperopolus, M.tenuis</u>
SWC 96	1742.6	Barren		Slst.	-	
SWC 95	1770.1	Negligible		Sh.	-	
SWC 94	1787.0	Barren	-	Slst.	-	
SWC 93	1804.0	Good	High	Sh.	1	<u>P.asperopolus, P.pachypolus</u>
SWC 92						
SWC 91	1858.2	Barren		Slst.	-	
SWC 90	1873.0	Fair	Low	Coal	1	<u>M.diversus frequent, M.tenuis</u>
SWC 89	1881.0	V. good	High	Sh., carb.	1	<u>P.tuberculiformis, P.xestiformis, T.moultonii, T.adelaidensis</u>
SWC 88	1889.0	Good	V. high	Sh.	1	<u>P.tuberculiformis</u>
SWC 87	1909.1	Negligible		Ss.	-	
SWC 86	1921.1	Good	Low	Ss.	2	ore-nate pynof
SWC 85	1950.5	Good	Low	Sh.	2	P granula common, T. adelaidensis

01/76

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
			SPORE	POLLEN			
SWC 84	1972.0	Barren			Sh.	-	
SWC 83	2002.4	Low	V. Low		Sh.	2	<u>A.obscurus</u> , abundant <u>C.splendens</u>
SWC 82	2035.0	Low	Fair		Sist.	1	Frequent <u>L.balmel</u> & <u>V.kopukeunsi</u>
SWC 81	2070.1	Good	Fair		Sist.	1	<u>L. balmel</u> & <u>Gleicheniidites</u> common, <u>V. kopukeunsi</u>
SWC 80	2096.4	Good	Fair		Sh., carb.		
SWC 79	2128.0	Good	Fair		Sist.	1	<u>G.rudata</u> , <u>V.kopukeunsi</u>
SWC 78	2152.1	V. Low	V. Low		Sh.	1	<u>L.balmel</u> common, <u>V.kopukeunsi</u> , <u>A.homomorpha</u>
Core 2	2188.3	Fair	High		Sh.	1	<u>G.rudata</u> , <u>V.kopukeunsi</u> , <u>A.obscurus</u> , <u>N.endurus</u>
Core 2	2194.18	V. good	High		Sh.	-	as above
SWC 76	2255.5	Fair	Low		Sist.	1	<u>L.balmel</u> & <u>Gleicheniidites</u> frequent, <u>V.</u> <u>kopukeunsi</u>
SWC 75	2270.0	Fair	Low		Sist.	-	<u>L. balmel</u> frequent
SWC 74	2288.0	V. good	Fair		Sh.	2	<u>Gleicheniidites</u> frequent
SWC 73	2309.2	Negligible	-		Sist.	-	
SWC 72	2333.1	Low	V. low		Sist.	-	<u>L.balmel</u> common, <u>P.verrucosus</u>
SWC 71	2358.0	Barren			Ss.	-	
SWC 70	2366.0	Good	Fair		Sist.	1	<u>L.balmel</u> common, <u>V.kopukeunsi</u>
SWC 69	2375.4	Barren			Ss.	-	
SWC 68	2392.6	V. low	Low		Ss.	-	
SWC 67	2397.6	Good	Fair		Sist.	-	<u>L.balmel</u> common, <u>T.verrucosus</u> , <u>H.eitlorii</u>

3/10

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
			SPORE	POLLEN			
SWC 66	2405.0	Barren			Volcanic	-	
SWC 64	2424.0	Low	Fair		Sist.	1	<u>L.balmel</u> , <u>T.verrucosus</u>
SWC 62	2435.6	Barren			Sist.	-	
Ctg	2460-65	Low	V. Low		-	3	<u>L.balmel</u> , <u>T.verrucosus</u>
SWC 61	2449.9	Good	Low		Dol.	-	<u>M.diversus</u> Zone palynoflora
SWC 58	2467.5	Low	Low		Sh.	-	
SWC 57	2474.5	Barren			Ss.	-	
Ctgs	2470-75	V. Low	V. Low			-	<u>H.harrisii</u> , <u>A.obscurus</u>
SWC 55	2484.7	Low	Low		Sh.	2	<u>L.balmel</u> , abundant <u>Protacidites</u>
SWC 54	2491.5	Barren	-		Ss.	-	
SWC 53	2495.7	Barren	-		Ss.	-	
SWC 52	2498.5	Good	Low		Sh.	1	<u>L.balmel</u> , <u>T.verrucosus</u>
SWC 51	2502.1	Fair	Low		Sist.	2	<u>L.balmel</u> , reworked Early Cretaceous' spp.
Ctgs	2510-15	V. Low	V. Low			3	<u>H.harrisii</u> , <u>T.verrucosus</u>
SWC 48	2512.6	Barren	-		Ss.	-	
SWC 47	2517.0	Barren	-		Sist.	-	
SWC 42	2539.2	V. Low	V. Low		Sist.	1	<u>L.balmel</u> , <u>T.verrucosus</u>
SWC 39	2552.5	Fair	Fair		Sist.	1	<u>L.balmel</u> , frequent <u>T.verrucosus</u>
SWC 38	2555.9	V. Low	Fair		Ss.	2	Frequent <u>T. verrucosus</u>
SWC 37	2557.0	Barren	-		Ss.	-	
SWC 36	2558.5	Fair	High		Sh.	1	<u>H.harrisii</u> , <u>L.balmel</u> , <u>T.verrucosus</u> , <u>N.endurus</u> , <u>T.gilii</u> , <u>G.rudata</u> , <u>T.confessus</u> , <u>A.obscurus</u>

01/17

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
			SPORE	POLLEN			
SWC 29	2582.1	Low	Fair		Sh.	2	<u>T.verrucosus</u> , <u>P.adenanthoides</u>
SWC 27	2593.0	Good	Fair		Sh.	2	<u>L.balmel</u> , <u>T.verucosus</u>
SWC 26	2600.0	Fair	High		Sh.	0	<u>S.punctatus</u> , <u>T.longus</u> , <u>T.lillieii</u> , frequent <u>G.rudata</u> , <u>P.otwayensis</u> , <u>P.pallsadus</u>
Core	2600.15	Fair	Low		Sh.	1	<u>P.reticuloconcavus</u> , <u>T.lillieii</u> , <u>T.apoxyxlinus</u>
Core	2601.3	Fair	Low		Sh.	0	<u>T.longus</u> , <u>S.punctatus</u>
SWC 25	2604	Low	High		Sh.	0	as above plus <u>G.rudata</u> (common), <u>T.waiparensis</u> , <u>P.reticuloconcavus</u> , <u>P.wahooensis</u>
Core 7	2624.38	Good	High		Sh.	0	<u>S.punctatus</u> , <u>T.verrucosus</u> , <u>T.longus</u> , <u>T.securus</u>
SWC 24	2625.0	Fair	Fair		Sh.	0	<u>T.longus</u> , <u>Q.brossus</u> , <u>S.punctatus</u> , <u>P.otwayensis</u>
Core 7	2633.87	V. good	Low		Sh.	0	<u>T.longus</u> , <u>S.punctatus</u> , palynoflora dominated by <u>G.rudata</u> .
Core 5	2648.62	V. good	Fair		Sh.	0	<u>T.longus</u> ; <u>S.punctatus</u> and <u>G.rudata</u> frequent
SWC 23	2650.0	Good			Sist.	1	<u>T.longus</u> , <u>S.Punctatus</u>
Core 7	2678.38	Barren			Sh.	-	
Core 7	2681.09	Negligible			Sh.	-	
SWC 19	2713	Low	Fair		Sh.	-	<u>T.longus</u> , <u>G.rudata</u> , <u>S.regium</u> , <u>T.sectilis</u>
SWC 18	2719.9	V. Low	Low		Sh.	-	<u>T.longus</u> , <u>G.rudata</u> , <u>P.otwayensis</u>

S/10

TABLE I : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
			SPORE	POLLEN			
SWC 17	2722.1	Negligible			Sh.	-	
SWC 16	2737.0	Negligible			Ss.	-	<u>G.rudata</u>
SWC 15	2742.5	Good	Fair		Coal	1	abundant <u>G.rudata</u> ; <u>T.verrucoous</u> ; <u>S.punctatus</u> , <u>P.retliculoconcavus</u> , <u>O.sentosa</u>
SWC 14	2744.6	Low	V. low		Sist.	-	<u>G.rudata</u> frequent
SWC 10	2764.0	V. good	High		Sh.	0	<u>G.rudata</u> common, <u>S.punctatus</u> , <u>P.cleinei</u> , <u>P.wahooensis</u> , <u>T.waiparensis</u>
SWC 9	2775.0	Fair	Low		Sh.	0	<u>G.rudata</u> abundant, <u>S.punctatus</u>
SWC 8	2789.0	V. Low	V. Low		Sist.	-	<u>G.rudata</u>
SWC 7	2800.0	Fair	Low		Sist.	2	<u>G.rudata</u> common, <u>T.lillieii</u>
SWC 6	2823.6	Low	Fair		Sh.		<u>T.lillieii</u> ; abundant <u>Nothofagidites</u>
SWC 3	2875.0	Low	Low		Ss./Sh.	1	<u>T.longus</u> , <u>G.rudata</u>
SWC 1	2934.0	V. Low	V. Low			-	<u>G.rudata</u>
SWC 162	2961.0	Barren			Conglom.	-	
SWC 161	2971.8	Negligible			Sist.		<u>N.flemingii</u> , <u>P.angulatus</u>
SWC 160	2978.2	Negligible			Conglom.		
SWC 159	2994.4	V. good	High		Sist.	2	<u>N.flemingii</u> , <u>T.lillieii</u> , <u>T.waiparensis</u> , <u>T.sectilis</u>
SWC 158	3002.0	Barren			Conglom.	-	
SWC 156	3026.4	V. Low	V. Low		Sist.	-	<u>G.rudata</u> , <u>T.sabulosus</u>
SWC 155	3039.0	V. Low	Low		Conglom.	-	<u>N.senectus</u> , <u>N.brachyspinulosus</u>
SWC 154	3051.8	Negligible			Sist.	-	<u>G.rudata</u>
SWC 151	3081.5	Barren			Conglom.	-	

6/19



TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSIS WIRRAH-3

SAMPLE NO.	DEPTH (m)	YIELD	DIVERSITY		LITHOLOGY	CONFIDENCE RATING	COMMENTS
			SPORE	POLLEN			
SWC 150	3088.0	Low	Low		Sist.	1	<u>G.rudata</u> frequent, <u>T.lillieii</u> , <u>T.sectilis</u>
SWC 149	3088.6	Negligible			Sist.		
SWC 147	3097.0	V. Low	V. Low		Sist.	2	<u>G.rudata</u>
SWC 145	3107.9	Fair	High		Sist.	1	<u>G.rudata</u> , <u>T.lillieii</u> , <u>N.flemingii</u>
SWC 143	3127.4	Barren			Sist.	-	
SWC 142	3132.8	Fair	High		Sist.	1	<u>T.lillieii</u> , <u>N.flemingii</u> , freq. <u>G.rudata</u>
SWC 141	3141.0	Negligible			Conglom.	-	
SWC 140	3159.2	V. Low	Low		Sist.	-	
SWC 137	3219.3	Fair	Low		Sist.	2	<u>N.senectus</u>
SWC 136	3222.0	Low	Fair		Ss.	2	<u>N.senectus</u> , <u>N.endurus</u> , <u>T.sabulosus</u>
Ctgs	3225.30	Low	Low			3	<u>Nothofagidites</u> spp., <u>T.sabulosus</u>
Ctgs	3230.35	Good	Low			-	Caved Eocene taxa
SWC 134	3241.9	V. Low	Low		Sist.	-	Long-ranging Cretaceous spores only
SWC 133	3242.5	Low	V. Low		?	2	<u>N.cf.endurus</u> , <u>T.cf.sabulosus</u>

0784L/1-7

1/10

TABLE 2

## ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	TAXON	COMMENTS
SWC 127	1485.3	<u>Rugulatisporites trophus</u>	Rare sp. (Gurnard Fm), with <u>Trilorites magnificus</u>
SWC 119	1497.4	<u>Sterelsporites punctatus</u>	Rare late appearance
SWC 118	1499.3	<u>Myrtacelidites verrucosus</u>	Rare sp.
SWC 116	1503.1	<u>M. eucalyptoides</u>	Rare sp. In Eocene
SWC 116	"	<u>Phyllocladidites paleogenicus</u>	Rare sp.
SWC 114	1507.0	<u>Proteacidites pachypolus</u>	Last appearance. <u>T. magnificus</u> present
SWC 114	"	<u>Dyphes colligerum</u>	Rare dinoflagellate
SWC 114	"	<u>Wetzeliella cf tabulatum</u>	First record
SWC 108	1520.1	<u>Phyllocladidites paleogenicus</u>	Rare sp.
SWC 108	"	<u>Podosporites erugatus</u>	Rare sp. In Eocene
SWC 108	"	<u>Haloragacidites verrucatoharrisii</u>	Rare ms sp. (Machphall)
SWC 108	"	<u>Verrucatosporites attinatus</u>	Rare sp.
SWC 102	1596.4	<u>Proteacidites callosus</u>	Rare sp.
SWC 101	1614.6	<u>Clavatiipollenites glarius</u>	Very rare sp.
SWC 100	1648.1	<u>Proteacidites lapis</u>	Not recorded above <u>P. asperopolus</u> Zone
SWC 100	"	<u>P. reflexus</u>	Rare sp.
SWC 97	1715.2	<u>Nothofagidites</u>	Common in assemblage
SWC 97	"	<u>Tricolpites philipsii f. durus</u>	Rare var..
SWC 97	"	" <u>Tricolpites reticulatus</u> "	Rare sp. (Stover & Evans)
SWC 90	1873.0	<u>Proteacidites recavus</u>	Very rarely recorded below <u>P. asperopolus</u> Zone
SWC 89	1881.0	<u>Foveotrilletes balteus</u>	Rare occurrence below Upper <u>M. diversus</u> Zone
SWC 88	1889.0	<u>Proteacidites tuberculotumulatus</u>	Very rare species, not usually found below Upper <u>M. diversus</u> Zone
SWC 88	"	<u>Gemmatricolporites cf gestus</u>	<u>G. gestus</u> ranges no lower than Lower <u>N. asperus</u> Zone

8/10

TABLE 2

## ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	TAXON	COMMENTS
Core	2600.15	<u>Tricolporites apoxyxinus</u>	?Rare sp.
Core 7	2624.38	<u>Proteacidites protograndis</u>	Ms sp. (Macphall)
SWC 19	2713.0	<u>Proteacidites protograndis</u>	Ms sp. (Macphall)
SWC 15	2742.5	<u>Ornamentifera sentosa</u>	V. rare sp.
SWC 6	2823.6	Abundant <u>Nothofagidites</u>	58%, ( <u>Gamblerina</u> 27%)
SWC 3	2875.0	<u>Tricolpites vergillus</u>	Rare ms sp. (Partridge)
SWC 159	2994.4	<u>Aglaoreidia</u> sp. nov.	Genus not previously recorded below Middle N. <u>asperus</u> Zone
SWC 159	"	<u>Nothofagidites flemingii</u>	Rare occurrence close to first appearance of sp.
SWC 159	"	<u>Gephyrapollenites wahooensis</u>	Rare sp.
SWC 159	"	<u>Tricolpites confragosus</u>	New ms sp. with <u>Proteacidites conflagrous</u> -style ornamentation
SWC 150	3088.0	<u>Foveotrilletes balteus</u>	V. rare in Late Cretaceous
SWC 142	3132.8	<u>Nothofagidites flemingii</u>	As for SWC 159
SWC 140	3159.2	<u>Basopollis otwayensis</u>	
SWC 136	3222.0	<u>Basopollis mutabilis</u>	

0784L/17

9/10

TABLE 2

## ANOMALOUS AND UNUSUAL OCCURRENCES OF SPORE-POLLEN TAXA IN WIRRAH-3

SAMPLE NO.	DEPTH(m)	TAXON	COMMENTS
SWC 88	1889.0	<u>Proteacidites latrobensis</u>	Not recorded below Upper <u>M. diversus</u> .
SWC 88	"	<u>P. rugulatus</u>	Not recorded below <u>P. asperopolus</u> Zone.
SWC 88	"	<u>Tricolporites circumlumenus</u>	Rare ms sp. (Macphall)
SWC 88	"	<u>Tricolpites phillipsii f. durus</u>	Rare var.
SWC 88	"	<u>Proteacidites</u> sp. nov.	Echinate, resembles <u>P. parvus</u> but much larger
SWC 83	2002.4	<u>Australopollis obscurus</u>	Reworked (?) In sample dated as Lower <u>M. diversus</u> Zone on geological data
SWC 82	2035.0	<u>Cupanoidites orthoteichus</u>	Not previously recorded below <u>M. diversus</u> Zone
SWC 82	"	<u>Tricolporites adelaidensis</u>	Not previously recorded below Middle <u>M. diversus</u> Zone
SWC 80	2096.4	<u>Tricolporites adelaidensis</u>	As for SWC 82
SWC 80	"	<u>Tetracolporites verrucosus</u>	Rare occurrence with <u>V. kopukuensis</u>
SWC 79	2128.0	<u>Tricolporites marginatus</u>	Uncommon sp.
Core 2	2188.30	<u>Phyllocladidites verrucosus</u>	Rare above Lower <u>L. balmei</u> Zone.
Core 2	"	<u>Polycolpites langstonii</u>	Var. with minute apiculae
Core 2	2194.18	<u>Foveotrilletes balteus</u>	As for SWC 89
SWC 74	2288.0	<u>Proteacidites amolosexinus</u>	Late Cretaceous sp.
SWC 68	2392.6	<u>Phyllocladidites reticulosaccatus</u>	Rare sp.
SWC 64	2424.0	<u>Proteacidites pallidus</u>	Late Cretaceous sp.
SWC 64	"	<u>Verrucosiporites cf kopukuensis</u>	Ancestral form of <u>V. kopukuensis</u> ?
SWC 59	2467.5	<u>Tricolpites marginatus</u>	As for SWC 79
SWC 59	"	<u>Proteacidites grandis</u>	Caved specimen?
SWC 39	2552.5	<u>P. grandis</u>	Caved specimen?
SWC 36	2558.5	<u>Gleicheniidites</u> spp.	Not usually abundant in this zone
SWC 36	"	<u>Schizaea digitatoides</u>	Uncommon sp.
SWC 36	"	<u>Verrucosiporites cf kopukuensis</u>	As for SWC 64
SWC 29	2582.1	<u>Schizocolpus marlinensis</u>	Not previously recorded below Lower <u>M. diversus</u> . Important record:

10/10