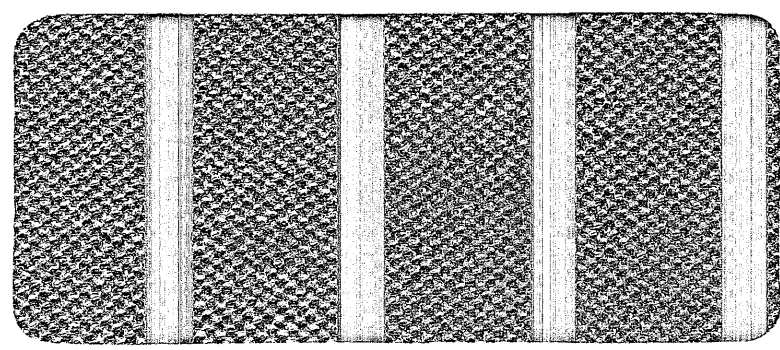


DEPT. NAT. RES & ENV
PE902224

WCS



WCS VOL 1

KUPAK-2

BASIC DATA

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WELL COMPLETION REPORT

KIPPER-2

VOLUME 1

BASIC DATA

AS
09 OCT 1987

PETROLEUM DIVISION

GIPPSLAND BASIN

VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: S.WILCOCK

SEPTEMBER 1987

KIPPER-2

WELL COMPLETION REPORT

VOLUME 1

BASIC DATA

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ESSO AUSTRALIA LTD

COMPLETION REPORT

WELL : KIPPER-2

LOCATION : Latitude : 38⁰ 11' 31.59" S
Longitude : 148⁰ 36' 45.20" E
X = 641 213mE
Y = 5 771 626mN
Map Projection: UTM
Geographical Location: Bass Strait, Victoria
Field: Kipper

PERMIT : Vic/P19

ELEVATION : 22m

WATER DEPTH : 107.3m

TOTAL DEPTH : 2600m

PLUG BACK TYPE : Cement Plug

REASONS FOR PLUGGING BACK : Plug and abandon

MOVE IN : 11th March, 1987

SPUDED : 12th March, 1987

REACHED T.D. : 15th April, 1987

RIG RELEASED : 22nd April, 1987

OPERATOR : Esso Exploration and Production Australia

PERMITTEE OR LICENCEE : Esso Exploration and Production Australia;
BHP Petroleum (Australia) Pty Ltd; Shell
Development (Australia); The News
Corporation Limited; TNT Management Pty Ltd;
Crusader (Victoria) Pty Ltd; and Mincorp
Offshore Pty Ltd.

ESSO INTEREST : 25%

OTHER INTEREST : BHP: 25%
Shell: 20%
News Corporation: 10%
TNT: 10%
Crusader: 7.5%
Mincorp: 2.5%.

CONTRACTOR : Diamond-M Drilling Company

RIG NAME : Diamond-M Epoch

EQUIPMENT TYPE : Semi-Submersible

TOTAL RIG DAYS : 42

DRILLING AFE NO. : 237200

TYPE COMPLETION : Plug and Abandon

WELL CLASSIFICATION : Before Drilling - Step-out
After Drilling - Field Extension

OPERATIONS SUMMARY

KIPPER-2

Moving/Mooring

Upon completion of the structural/marine safety inspection and rig acceptance tests, the semi-submersible Diamond M. Epoch was towed from the inspection site at Beauty Point on the River Tamar in Northern Tasmania to open waters off the river's mouth. The rig anchors, which had 50^o fluke angles, were then replaced with anchors having 34^o fluke angles. Under tow by the workboat Lady Penelope, the rig departed for Kipper-2 at 0230 hours on March 10, 1987 and arrived on location at 1630 hours the next day. The rig as towed approximately 200 nautical miles in 38 hours at an average speed of 5.3 kts.

Anchor No. 6 was dropped by the rig on approach to the location. The remaining seven anchors were run by the workboats "Lady Caroline" and "Lady Penelope". All anchors were successfully pull tested to a minimum of 275 kips.

The final rig position was: Latitude: 38^o 11' 31.59" S 5791626
 Longitude: 148^o 36' 45.20" E 641213

AMG Zone 55, Universal Transverse Mercator Projection, Australian Geodetic Datum.

The rig was located at 6.2m on a bearing of 200^o from the called location and approximately 64 km at 112^o from Lakes Entrance, Victoria.

Drill 26" Hole for 20" Casing

The drilling template was run and landed at a seafloor depth of 129m. The 26" hole was drilled to 274m using seawater and high viscosity gel slugs. At TD, the hole was displaced with 400 bbls hi-vis mud before making a wiper trip to the seafloor. The hole was again displaced with 400 blls hi-vis mud prior to pulling out to run casing.

The 20" casing and 18-3/4" pile joint assembly were then run and cemented with the 20" shoe at 259m.

The BOP stack was run and landed, after which the shear rams, collet connector, and 20" casing were tested to 500 psi. A total of 0.39 days were lost while running the stack and riser due to; 1) having crossed control system hoses below the blue pod, 2) accidentally unlatching the yellow pod while lowering the stack, and 3) failing to install O-rings into the diverter housing connector.

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

After function testing the diverter system, the 20" casing was drilled out and the 17-1/2" hole drilled to 835m. A seawater/prehydrated gel slug mud system was used. A wiper trip was made to the 20" shoe before pulling out to run a BHC/GR/CAL log.

The 13-3/8" casing was then run and cemented with the shoe at 820m. Miscalculation of the 13-3/8" cement volume resulted in a higher than programmed TOC. The TOC was later calculated to be at approximately 200m, instead of the programmed and reported 320m. The 13-3/8" weight set seal assembly was set and tested, along with the BOP stack, to 200/3500/5000 psi. The 13-3/8" casing was tested against the shear rams to 1500 psi.

Drill 12-1/4" Hole

The float collar and cement were drilled out to 815m, where a Phase I PIT was conducted to 1500 psi. The remaining cement and 5m of new hole were then drilled. A Phase II PIT was conducted to leak-off at 15.7 ppg EMW.

After drilling to 861m, the bit was pulled due to low ROP. The bit was found to be in excellent condition and was thus rerun. Drilling continued to 1598m using a seawater/prehydrated gel/native clay mud. Hole swabbing and drag were experienced on the trip out from 1598m as a result of bit and stabilizer balling.

Drilling proceeded through the Top of Latrobe formation (top at 1568) down to 2039m, where a bit trip was made. Only one mud pump was on line below 1777m due to repairs on the second pump. The next bit drilled to core point at 2216m, including a section of (erosion-prone) volcanics from 2071 to 2211m. The mud weight was raised to 9.6 ppg by 2080m in order to provide the programmed 300 psi overbalance into the top of the S-1 gas reservoir which lay beneath the volcanics. The entire bit run was made with only one mud pump on line while drilling. The circulating rate was thus limited to 610 gpm, instead of the programmed 750 gpm.

On a short trip from 2216 to 1591m, tight hole and drag were experienced from 2090 to 1645m; i.e., through the in-gauge Top of Latrobe sandstone formation. The tight hole and drag were caused by a combination of a sticky clay formation at the top of the volcanics (base of sandstone), as well as cuttings and/or cavings falling in on the BHA in the gauge portion of the hole. The drillstring pulled free in the washed out Lakes Entrance formation above the Top of Latrobe sandstone.

After making a second wiper trip to 1380m, the hole was circulated with both pumps on line and swept with a high viscosity weighted pill. A large amount of cuttings/cavings were pumped out of the hole. No drag was experienced on the trip out of the hole.

A Diamant-Boart 12-1/4" x 5-1/4" CD502 PDC corehead and 8" x 5-1/4" corebarrel with a fibreglass inner barrel were used to cut core No. 1 from 2216 to 2222m. Although the first five meters cored at an average ROP of 16m/hr, siltstone in the last meter of core slowed ROP to below 1m/hr. The core was pulled with 96% recovery and 75% wear on the corehead.

The BOP stack was then tested to 200/3500/5000 psi. Following the test, a massive leak developed on the yellow pod. The pod was pulled to find the 1" SPM valve on the shear ram open function stuck in the vent position. The valve failure was caused by heavy corrosion in the SPM valve spring housing, which prevented the valve from closing. The pod was rerun and used to function test the BOP stack. A Diamant Boart 12 1/4" CB303 diamond corehead and 8" x 5-1/4" core barrel had been run in the hole during the yellow pod repairs. Core No. 2 was cut from 2222 to 2231m. Only 2.8% of the core was recovered. The corehead was worn 45%. The bottom 2m of the fibreglass inner barrel had broken off and the spring type core catcher was left in the hole.

The exact cause of the failure is unknown. However, one possible explanation is that the core catcher was dislodged when (abruptly) tagging fill on bottom without effective drillstring compensation. (The motion compensator air compressors had been turned off while repairing the yellow pod.) The dislodged core catcher could have then tore the inner barrel as coring progressed.

Drilling continued to the next corepoint at 2281m. The hole was continuously cored from 2281 to 2360.1m. Six cores were cut using two 12-1/4" x 5-1/4" CB303 coreheads and a conventional steel inner barrel. Recoveries ranged from 69 to 100%, averaging 87%.

The BOP stack was again tested to 200/3500/5000 psi. While attempting to set the wear bushing with the kelly and rotary table after the stack test, the string was "picked up" above the shear rams. The rams were then closed to allow tagging them with the wear bushing running tool (WBRT) to confirm that the wear bushing had been set. However, the string had actually backed off just below the kelly. The shear rams were in fact closed on and sheared the drill pipe joint above the WBRT.

An overshot was then picked up to retrieve the drillpipe above the cut. While working the overshot onto the fish by rotating the string with chain tongs, the overshot dripped 3m. The chain tongs could not be released in time and were consequently dropped in the hole. The 117m of drillpipe above the cut were, however, recovered.

The first two attempts to dress the top of the sheared drillpipe with a 9-5/8" x 5" choked guide failed as the guide and slipped past the top of the fish. After an 18-3/8" marine swivel was picked up as a centralizer, the top of the fish was dressed off in two runs.

The wear bushing and WBRT were eventually retrieved after four runs with a 9-5/8" overshot run above an 18" cut lip/15" guide. The multiple runs were required to modify the fishing assembly to catch the fish. (Also during this operation, a leak developed on the yellow pod, upper annular open function. The pod was pulled to find that 1" SPM valve stuck open. The valve failure was identical to the previous 1" SPM valve failure; i.e., caused by corrosion in the spring housing. The SPM valve was replaced and the pod rerun. No additional downtime was incurred due to this failure.

Still left in the hole were the chain tong handle and chain, one half of the tong claw, and a flattened piece of drillpipe. Following a stack test, two runs were made with a globe type junk basket. Recovered from the well were one piece of metal and pieces of the chain tong chain.

While making up the drilling BHA, the drillpipe float was dropped into the hole. Thus, a third run was made with the globe type junk basket to recover the float.

Drilling progressed to the (unprogrammed) intermediate logging point at 2393m. A supercombo (DLL/MSFL/LDL/CNL/GR/SP/CAL/AMS) log was run, as well as one pressure and eight sampling runs with the RFT tool.

The hole was then drilled to the next corepoint at 2429.2m. Core No. 9 was cut from 2429.2m to 2439m with a rerun 12-1/4" x 5-1/4" CB303 corehead. Core Drilling then continued to a TD of 2600m, 28m deeper than originally programmed. After testing the BOP stack to 200/3500/5000 psi, the hole was logged with the supercombo tool, dipmeter, velocity survey, and sidewall coring gun.

Plug and Abandonment

Balanced open hole cement plugs No. 1 and 2 were set from 2380 to 2270m, and 2268 to 2164m respectively. The latter plug was tagged with 15 kips. These two plugs were set to cover the hydrocarbon bearing zones. A third open hole cement plug was set from 1590 to 1477m to cover permeable Top of Latrobe sandstone. This plug was tagged with 15 kips.

A balanced plug was then set across the 13-3/8" casing shoe (820m from 774 to 850m). The plug was pressure tested to 1500 psi and tagged with 15 kips before displacing the hole with seawater. After running a gauge ring/junk basket to 750m a 13-3/8" EZSV bridge plug was set at 740m (wireline depth). The 13-3/8" casing was then cut with a Pengo explosive cutter at 220m.

The 13-3/8" wear bushing was pulled, after which an unsuccessful attempt was made to pull the 13-3/8" casing with a Tri-State type "B" casing spear. The spear would not engage the casing. The cause of the failure is unknown. The spear later worked properly on a test joint in the Tri-State shop. An unsuccessful attempt was then made to retrieve the 13-3/8" seal assembly while waiting for a 13-3/8" grapple for the Bowen Itco spear.

The Bowen Itco spear was run and engaged, however, the casing could not be freed with 250 kips overpull. The casing (cut) was then pressure tested to 500 psi. The casing was next cut with a mechanical cutter at 204m, and again the casing (cut) pressure tested to 500 psi. The Bowen Itco spear was rerun. With 250 kips overpull, the casing was pulled free. The annulus was pressure tested to 500 psi while laying down casing.

The inability to pull the casing after the first cut at 220m, the successful pressure tests into the casing cuts, and the 250 kips overpull required to free the casing were due to the fact that the 20" x 13-3/8" annulus was cemented up. This was not realized until during the P&A operations. The annular TOC had been reported as 320m. Later calculations showed a theoretical TOC at 200m, 4m above the second casing cut. Cement contaminated mud was found on the bottom joints of the retrieved casing.

A balanced plug (No. 6) was then set from 683 to 728m on top of the EZSV bridge plug, which was tagged with drillpipe at 728m. Plug No. 7 was set across the 13-3/8" casing stub from 170 to 250m and pressure tested to 500 psi.

The BOP stack and riser were pulled after waiting on weather for 13.25 hours. A ported 18-3/4" wellhead housing running tool (sent to the rig specifically for use when blowing wellheads), could not be made up due to a bad box connection. Thus, the 30" housing running tool was made up above the ICI 3.9 kg shaped charge and run and landed on the 18-3/4" wellhead. The 20" casing was blown at 138m before retrieving the shooting string.

The severed wellhead, four-post guidebase, and drilling template were retrieved using the rig's non-ported 18-3/4" wellhead housing running tool.

Pulling Anchors

The rig was deballasted before pulling the anchors with the workboats, Lady Penelope and Lady Caroline. Under tow by the Lady Penelope, the rig departed for the Remora-1 location at 0600 hours on April 22, 1987.

CASING DATA

KIPPER-2

CASING OD-IN.	CASING WT-PPF	CASING GRADE	CASING CONN.	CASING LENGTH-M.	SHOE MRKB	REMARKS
20	94	X-56	JV	14.12	259.00	FLOAT SHOE JOINT
20	94	X-56	JV	96.16		7 INTERMEDIATE JOINTS
20	129	X-52	JVXCC	12.36		CROSSOVER JOINT
24	670		CC	10.36		PILE JOINT - EP9-1-2-3
13-3/8"	54.5	K-55	BTC	12.76	819.77	FLOAT SHOE JOINT
13-3/8"	54.5	K-55	BTC	12.33		FLOAT JOINT
13-3/8"	54.5	K-55	BTC	12.66		FLOAT COLLAR JOINT
13-3/8"	54.5	K-55	BTC	642.74		53 INTERMEDIATE JOINTS
13-3/8"	54.5	K-55	BTC	11.96		CASING HANGER JOINT CSG. HNGR.-EHW35-1-2 S/A-ESW31-1-2-3

CEMENT DATA

KIPPER-2

NOTE: ALL CEMENT - CLASS "G".

JOB TYPE	INTERVAL M-RKB	VOLUME- SACKS	SLURRY WT-PPG	ADDITIVES	MIX WATER	REMARKS
20" PRIMARY- LEAD		650	13.2	2.2% PHG	50/50 FW/SW	GEL PREHYDRATED IN FRESHWATER.
	259 - SEAFLOOR					
20" PRIMARY- TAIL		350	16.0	-	SW	
13-3/8" PRIMARY	820- 204	1460	15.8	-	SW	CEMENT VOLUME MISCALCULATED. PROGRAMMED TOC - 320M
P&A PLUG NO. 1	2380-2270	280	15.8	0.8% HR6L	FW	
P&A PLUG NO. 2	2268-2164	310	15.8	0.8% HR6L	FW	TAGGED WITH 15 KIPS.
P&A PLUG NO. 3	1590-1477	280	15.8	0.2% HR6L	FW	TAGGED WITH 15 KIPS.
P&A PLUG NO. 4	850- 774	225	15.8	-	FW	TESTED TO 1500 PSI. TAGGED WITH 15 KIPS.
P&A PLUG NO. 6	728- 683	110	15.8	-	SW	SET ON TOP OF EZSV.
P&A PLUG NO. 7	250- 170	310	15.8	-	SW	TESTED TO 500 PSI.

WELL: KIPPER-2

SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

<u>INTERVAL</u>	<u>TYPE</u>
820.0-2601.5m	Cutting samples - 3 sets of washed and oven-dried and one set of lightly washed bagged samples. Sampled from 820-1400m at 10m intervals. Sampled from 1440-2216m; 2231-2281m; 2360.1-2429.2m and 2439.0-2601.5m at 5m intervals.
820.0-2601.5m	Cuttings samples - unwashed canned samples. Sampled from 820-1400m at 30m intervals. Sampled from 1400-2601.5m at 15m intervals.
2216.0-2222.0m	Core No. 1, recovery 96%
2222.0-2231.0m	Core No. 2, recovery 3%
2281.0-2294.3m	Core No. 3, recovery 90%
2294.3-2311.5m	Core No. 4, recovery 94%
2311.5-2320.8m	Core No. 5, recovery 73%
2320.8-2338.8m	Core No. 6, recovery 100%
2338.8-2346.7m	Core No. 7, recovery 99%
2346.7-2360.1m	Core No. 8, recovery 69%
2429.2-2439.0m	Core No. 9, recovery 100%
2590.1-1523.9m	CST, Shot 60, Recovered 58

2651L/36

WELL: KIPPER-2

WIRELINER LOGS AND SURVEYS

<u>Type and Scale</u>	<u>From</u>	<u>To</u>
<u>Suite 1</u>		
GR	259.0-	129.6m
SLS-CAL-GR	1:200 1:500	827.1- 259.0m
JB, BP-0, TGC RUN 1	1:200	
<u>Suite 2</u>		
LDL-CNL-GR-AMS	1:200	2382.5-1485.0m
DLL-MSFL-GR-SP	1:200	2388.0- 820.5m
COMPOSITE LOG	1:500	2388.0- 820.5m
HP GAUGE PRETESTS RUN 1 RFT-GR PRETESTS RUN 1 HP GAUGE SAMPLES RFT-GR SAMPLES		
<u>Suite 3</u>		
BHC-GR	1:200 1:500	2600.0- 820.0m
LDL-CNL-AMS-GR	1:200	2600.0-2297.0m
DLL-MSFL-GR	1:200	2600.0-2297.0m
DLL-MSFL-LDL-CNL-GR	1:500	2388.0-2596.5m
SHDT-GR	1:200	2600.0-1490.0m
CST-GR WST (CHECKSHOT)		2590.0-1524.0m 2595.0- 266.0m
STRATIGRAPHIC DIPMETER COMPUTATION	1:200 1:500	2602.5-1489.5m

2651L/39

SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - KIPPER-2

TEST & SEAT NO.	DEPTH (METRES) K.B.	CHAMBER Litres	RECOVERY (LITRES)				FORMATION WATER Litres	MUD FILTRATE Litres	HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
			OIL	COND.	GAS				MPaa	Psia	MPaa	Psia	
			Litres	Litres	m ³								
1/1	2358.5	Pretest						23.48	3405.77	26.92	3904.7	Valid	
1/2	2358.8	Pretest						23.44	3398.88	26.87	3896.6	Valid	
1/3	2339.3	Pretest						23.29	3377.90	26.71	3873.9	Valid	
1/4	2334.0	Pretest						23.24	3371.09	26.65	3864.9	Valid	
1/5	2325.3	Pretest						-	-	-	-	Seal failure	
1/6	2325.0	Pretest						23.16	3358.42	26.55	3850.4	Valid	
1/7	2321.0	Pretest						23.12	3352.72	26.51	3844.6	Valid	
1/8	2308.0	Pretest						23.03	3340.47	26.43	3823.7	Valid	
1/9	2305.2	Pretest						23.02	3337.93	26.32	3817.9	Valid	
1/10	2301.4	Pretest						23.01	3336.65	26.28	3812.0	High pressure? Supercharged	
1/11	2298.0	Pretest						23.00	3335.09	26.24	3805.9	Valid	
1/12	2291.3	Pretest						22.98	3333.05	26.17	3795.1	Valid	
1/13	2287.5	Pretest						22.98	3332.39	26.12	3788.4	Tight - fair test	
1/14	2281.5	Pretest						22.96	3329.63	26.05	3777.4	Valid	
1/15	2270.5	Pretest						22.94	3326.59	25.92	3759.7	Valid	
1/16	2234.5	Pretest						-	-	-	-	Seal failure	
1/17	2234.5	Pretest						22.87	3317.16	25.51	3699.8	Valid	
1/18	2219.0	Pretest						22.85	3313.51	25.33	3674.0	Tight. Fair test.	
1/19	2214.5	Pretest						22.84	3313.87	25.29	3667.7	Valid	
1/20	2062.2	Pretest						20.43	2963.04	23.57	3418.0	Valid	
1/21	1914.0	Pretest						-	-	-	-	Tight	

SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - KIPPER-2

TEST & SEAT NO.	DEPTH (METRES) K.B.	CHAMBER Litres	RECOVERY (LITRES)				FORMATION WATER Litres	MUD FILTRATE Litres	HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
			OIL Litres	COND. Litres	GAS m ³	MPaa			Psia	MPaa	Psia		
1/22	1904.5	Pretest						18.85	2733.54	21.78	3159.2	Valid	
1/23	1831.0	Pretest						18.13	2629.14	20.95	3038.4	Valid	
1/24	1694.0	Pretest						16.77	2432.80	19.40	2814.2	Valid	
2/25	2308.0	22.8 3.8	10.5 -	- -	1.26 -	4.0 * -	- -	23.01	3337.46	26.31	3815.6	Valid. 3.8 litre chamber - preserved	
3/26	2318.2	-						-	-	-	-	Tight. No sample.	
3/27	2318.4	22.8 3.8	0.25 0.25	- -	0.14 0.01	- -	20.0 3.0	23.09	3348.5	26.43	3832.9	Valid. Samples taken	
4/28	2303.0	22.8 3.8	- -	0.5 -	3.45 -	- -	1.5 -	23.01	3337.0	26.26	3808.2	Valid. 3.8 litre chamber - preserved	
5/29	2305.2	22.8 3.8	- -	0.25 Scum	1.18 -	- -	14.5 1.25	23.02	3338.5	26.28	3811.6	Valid. Samples taken.	
6/30	2334.2	22.8 3.8	- -	- -	- -	22.0 3.75	- -	23.25	3371.5	26.59	3857.0	Valid	
7/31	2277.2	22.8 3.8	- -	0.5 -	3.51 -	- -	0.75 -	22.98	3332.7	25.96	3764.6	Very high permeability. 3.8 litre chamber - preserved	
8/32	2321.2	22.8 3.8	- -	- -	- -	20.8 * 3.7 *	- -	23.10	3351.1	26.44	3835.0	Fair test	
9/33	2306.5	22.8 3.8	9.25 -	- -	0.97 -	- -	4.0 -	23.04	3341.0	26.28	3811.0	Tight 3.8 litre chamber - preserved	

* Mud and filtrate

TEMPERATURE RECORD - KIPPER-2

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 1</u>						
SLS-CAL-GR	827.1	38.0	5.83	4.16		
<u>Suite 2</u>						
DLL-MSFL-LDL-CNL-AMS-SP-GR	2392.5	74.4	1.42	10.73	104.4	40.71
RFT-GR (PRETEST)	2392.5	84.5	1.42	16.75		
<u>Suite 3</u>						
DLL-MSFL-LDL-CNL-BHC-GR	2601.5	92.2	1.42	14.0		
SHDT-GR	2601.5	96.6	1.42	19.25	107.6	39.48

Figures

LOCALITY MAP KIPPER-2

SCALE 1:250 000

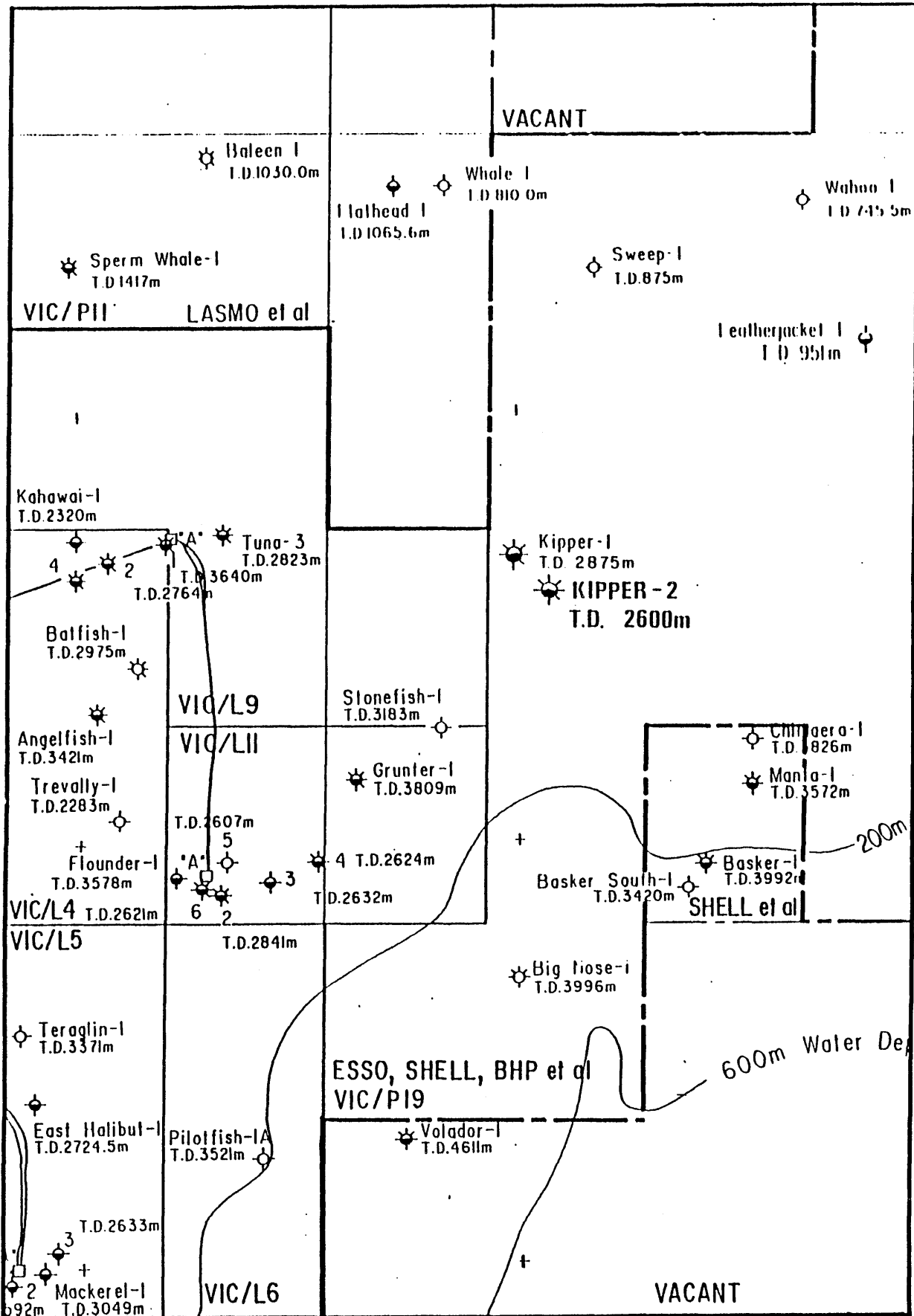


Figure 1

KIPPER-2 PROGRESS CURVE

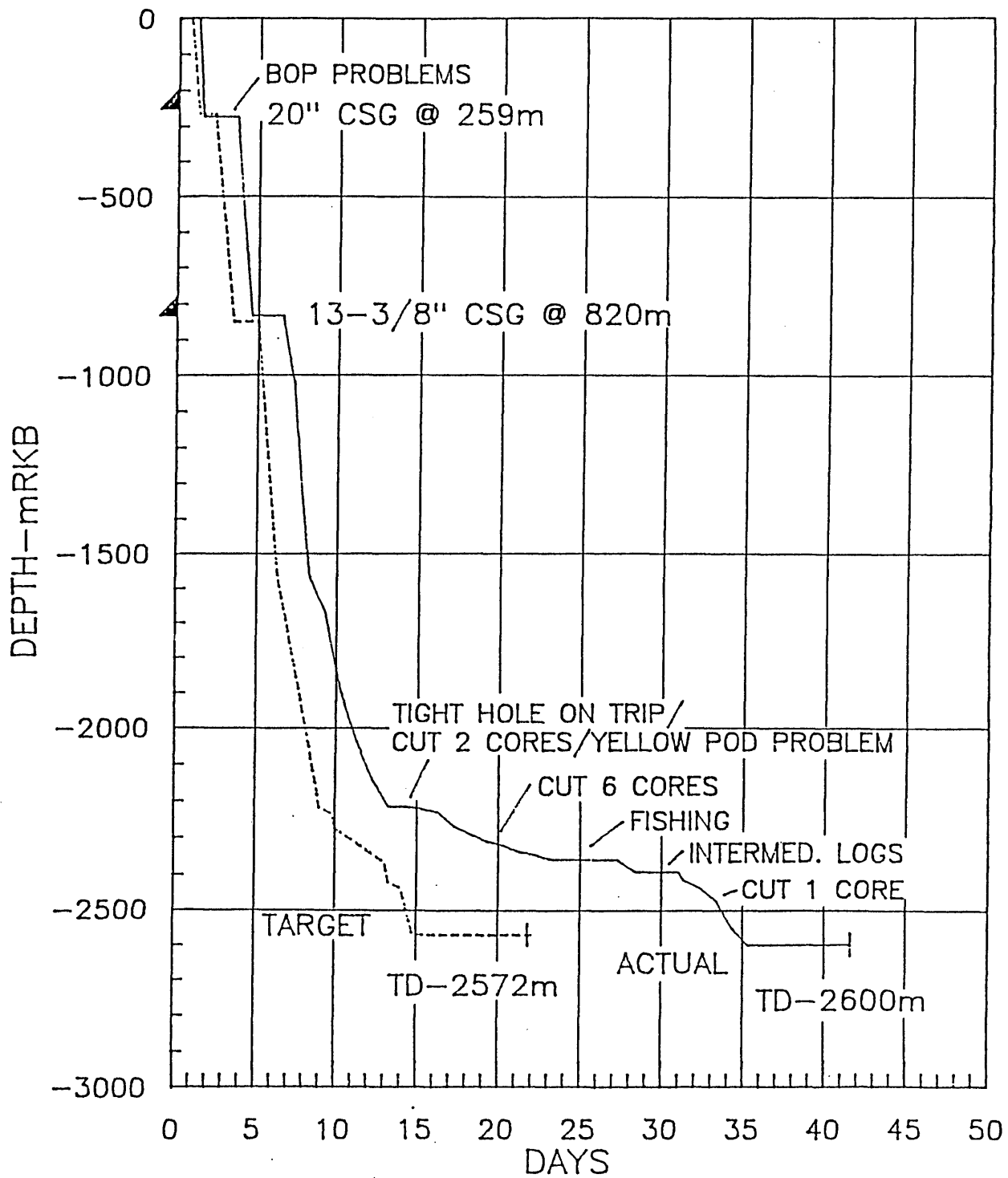


Figure 2

KIPPER - 2 WELLBORE SCHEMATIC

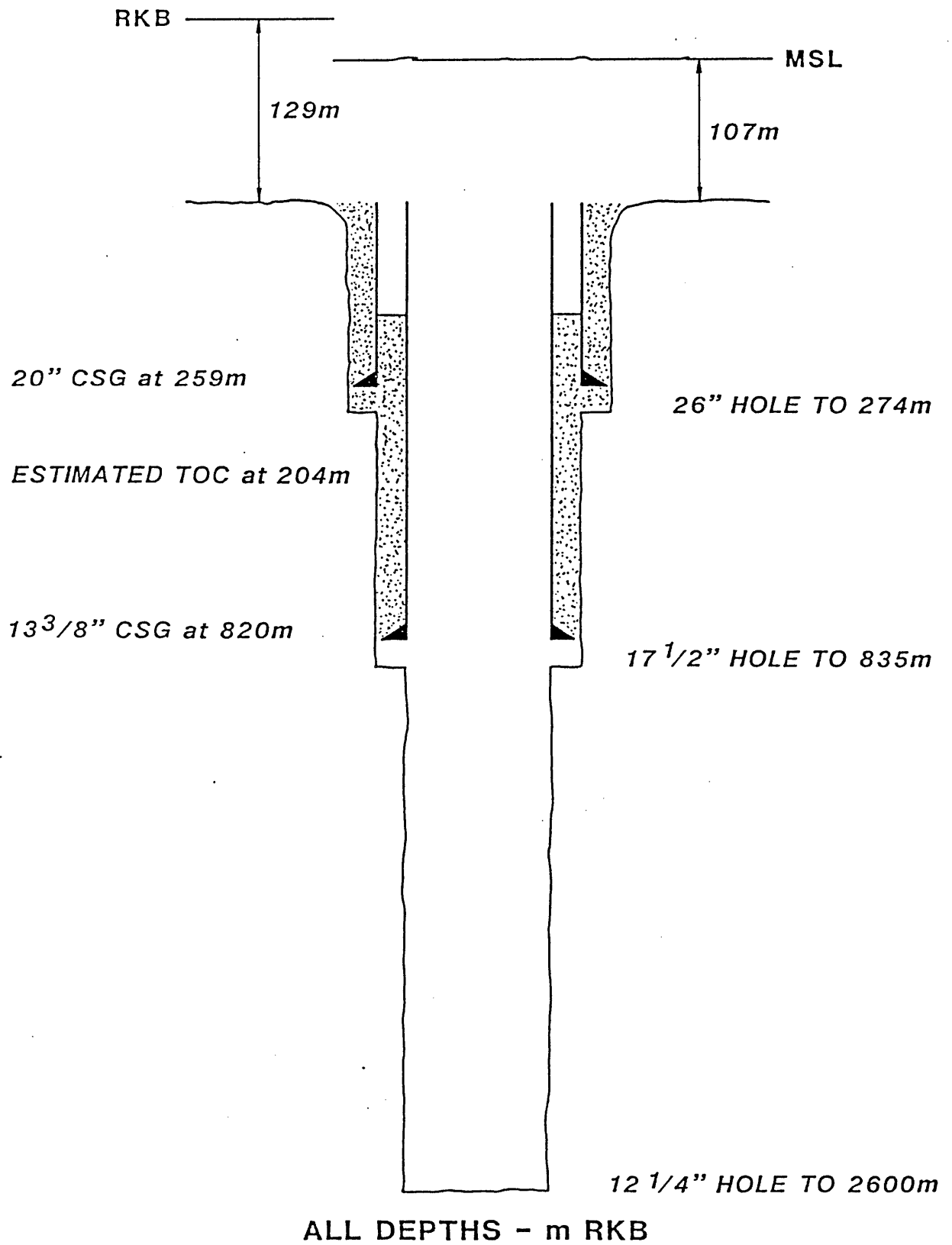


Figure 3

KIPPER - 2 ABANDONMENT SCHEMATIC

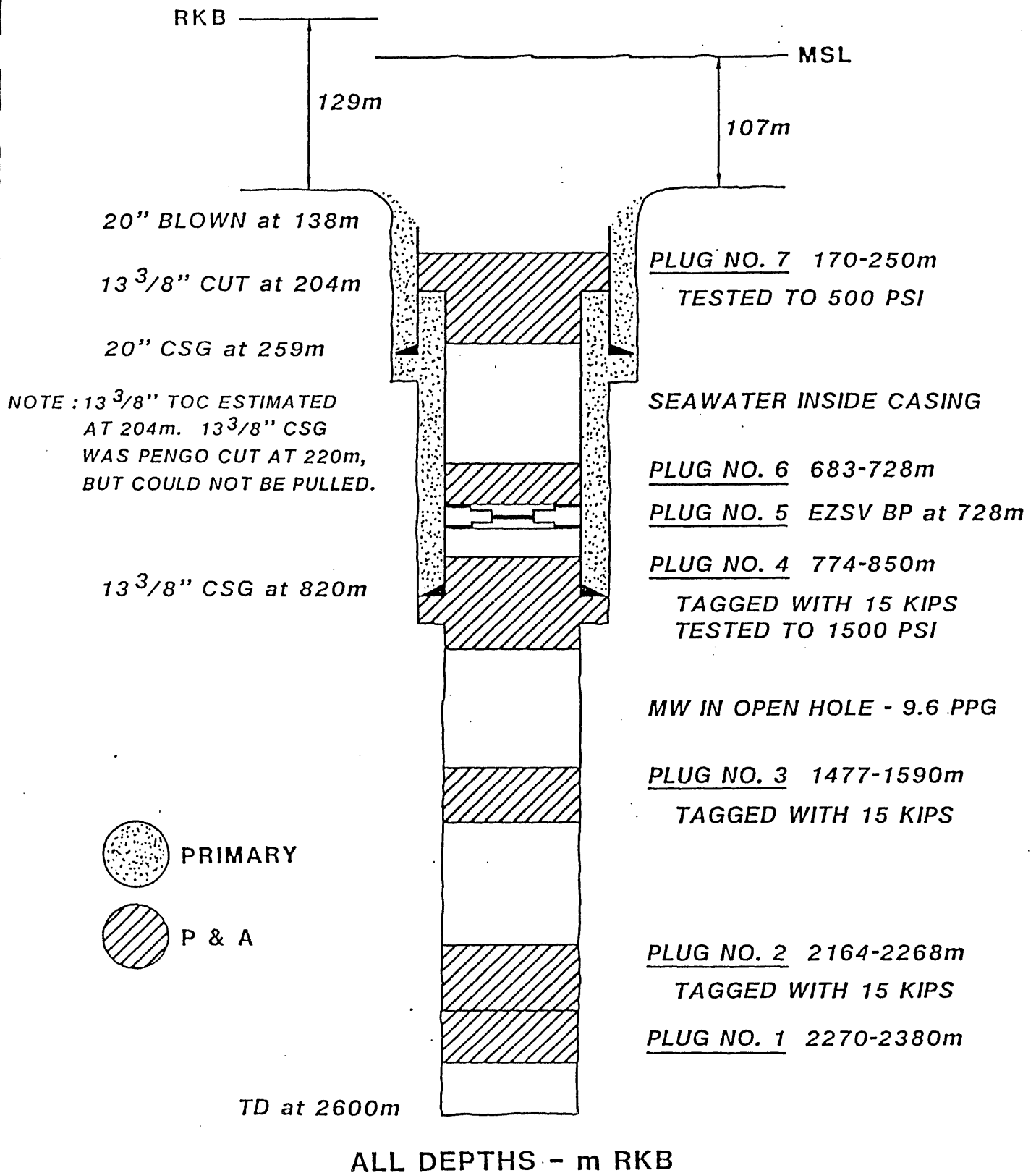


Figure 4

KIPPER-2

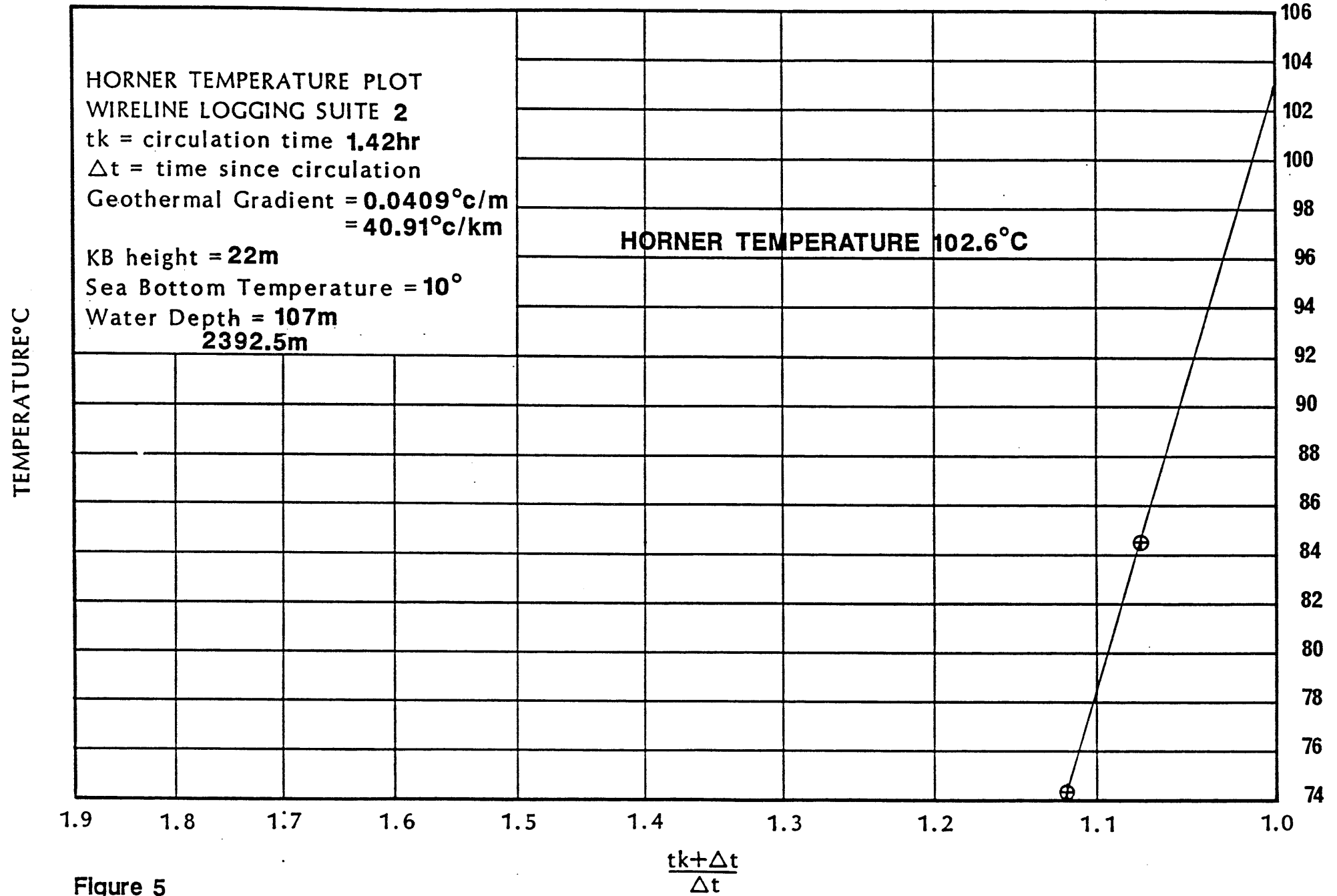


Figure 5

KIPPER-2

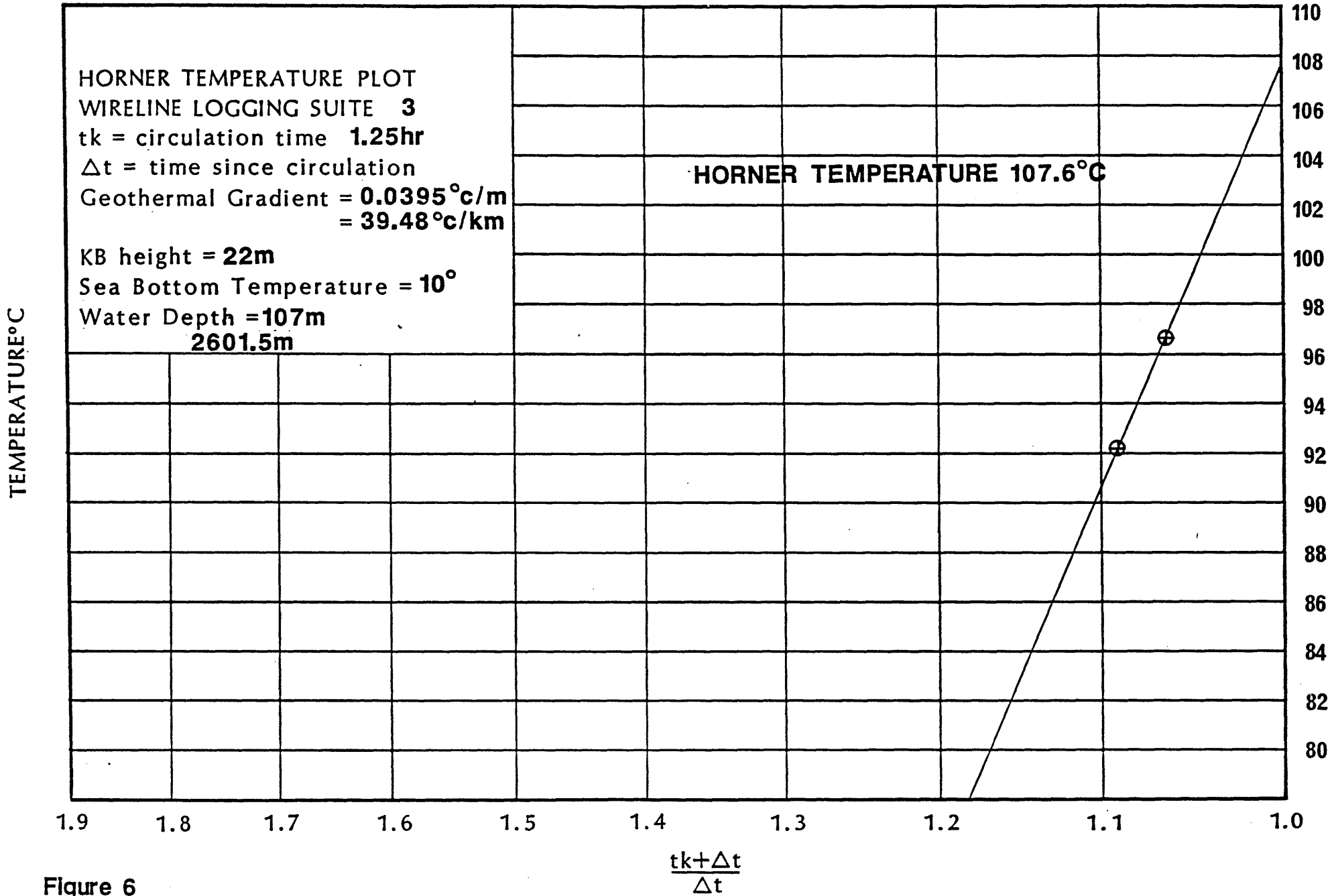


Figure 6

Appendix 1

KIPPER-2

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Descriptions</u>
840 - 850m	100	CALCISILTITE: medium to light grey, soft to firm, often dispersive, common bryzoan/shell fragments, very calcareous, argillaceous, trace foraminifera.
850 - 860m	100	CALCISILTITE: as above.
860 - 870m	100	CALCISILTITE: as above.
870 - 880m	100	CALCISILTITE: as above.
880 - 890m	100	CALCISILTITE: as above.
890 - 900m	80	CALCISILTITE: as above.
	10	CALCARENITE: light grey, coarse grained, shell and bryzoan fragments.
	10	CALCILUTITE: medium to dark grey carbonaceous.
900 - 910m	80	CALCISILTITE: as above.
	10	CALCARENITE: as above.
	10	CALCILUTITE: as above.
910 - 920m	70	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
	10	CALCARENITE: as above.
920 - 930m	60	CALCISILTITE: as above.
	30	CALCILUTITE: as above.
	10	CALCARENITE: as above.
930 - 940m	60	CALCISILTITE: as above.
	30	CALCILUTITE: as above.
	10	CALCARENITE: as above.
940 - 950m	60	CALCISILTITE: medium to light grey, soft to firm, minor carbonaceous material, very calcareous, grades to calcarenite and calcilutite.
	30	CALCILUTITE: medium grey, very argillaceous, very calcareous.
	10	CALCARENITE: medium grey, coarse grained, bryzoan and shell fragments, common benthonic foraminifera.
950 - 960m	60	CALCISILTITE: as above.
	30	CALCILUTITE: as above.
	10	CALCARENITE: as above.
960 - 970m	70	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
	10	CALCARENITE: as above.
970 - 980m	70	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
	10	CALCARENITE: as above.
980 - 1000m	70	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
	10	CALCARENITE: as above.

1000 - 1010m	60 30 10	CALCISILTITE: as above. CALCILUTITE: as above. CALCARENITE: as above.
1010 - 1020m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1020 - 1030m	60 40	CALCISILTITE: as above. CALCILUTITE: as above.
1030 - 1040m	60 40	CALCISILTITE: as above. CALCILUTITE: as above.
1040 - 1050m	60 40	CALCISILTITE: as above. CALCILUTITE: as above.
1050 - 1060m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1060 - 1070m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1070 - 1080m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1080 - 1090m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1090 - 1100m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1100 - 1110m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1110 - 1120m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1120 - 1130m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1130 - 1140m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1140 - 1150m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1150 - 1160m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1160 - 1170m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1170 - 1180m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1180 - 1190m	70 30	CALCISILTITE: as above, becoming firm. CALCILUTITE: as above.
1190 - 1200m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1200 - 1210m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.

1210 - 1220m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1220 - 1230m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1230 - 1240m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1240 - 1250m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1250 - 1260m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1260 - 1270m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1270 - 1280m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1280 - 1290m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1290 - 1300m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1300 - 1310m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1310 - 1320m	70 30	CALCISILTITE: medium grey to olive green, soft to firm, occasionally dispersed, rounded, blocky cutting, very calcareous. CALCISILTITE: medium to light grey, occasionally cream to white, firm to hard, blocky cutting.
1320 - 1330m	70 30	CALCILUTITE: as above. CALCISILTITE: as above.
1330 - 1340m	70 30	CALCILUTITE: as above. CALCISILTITE: as above.
1340 - 1350m	60 40	CALCISILTITE: as above. CALCILUTITE: as above.
1350 - 1360m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1360 - 1370m	30 70	CALCILUTITE: as above. CALCISILTITE: as above.
1370 - 1380m	40 60	CALCILUTITE: as above. CALCISILTITE: as above.
1380 - 1390m	50 50	CALCILUTITE: as above. CALCISILTITE: as above.
1390 - 1400m	50 50	CALCILUTITE: as above. CALCISILTITE: as above.
1400 - 1410m	50 50	CALCILUTITE: as above. CALCISILTITE: as above.

1410 - 1420m	80 20	CALCILUTITE: as above. CALCISILTITE: as above.
1420 - 1430m	60 40	CALCILUTITE: as above. CALCISILTITE: as above.
1430 - 1440m	50 50	CALCILUTITE: as above. CALCISILTITE: as above.
1440 - 1450m	50 50	CALCISILTITE: light to medium grey to white, firm to hard, calcareous, rare glauconite; block to rounded cuttings, very argillaceous in places, grades to calcilutite. CALCILUTITE: medium grey to olive grey green, calcareous, argillaceous, soft to firm.
1450 - 1460m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1460 - 1470m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1470 - 1480m	70 30	CALCISILTITE: as above. CALCILUTITE: as above.
1480 - 1490m	80 20	CALCISILTITE: as above. CALCILUTITE: as above.
1490 - 1500m	60 40	CALCISILTITE: as above. CALCILUTITE: as above.
1500 - 1505m	50 50	CALCISILTITE: as above. CALCILUTITE: as above.
1505 - 1510m	80 20	CALCISILTITE: as above. CALCILUTITE: as above.
1510 - 1515m	80 20	CALCISILTITE: as above; becoming more glauconitic. CALCILUTITE: as above.
1515 - 1520m	80 20	CALCISILTITE: as above. CALCILUTITE: as above.
1520 - 1525m	70 30	CALCISILTITE: as above; common glauconite. CALCILUTITE: as above.
1525 - 1530m	80 20	CALCISILTITE: as above; with common glauconite, rare pyrite and minor fine quartz grains. CALCILUTITE: as above.
1530 - 1535m	70 20 10	CALCISILTITE: as above. CALCILUTITE: as above. CALCAREOUS SANDSTONE: fine to medium grained quartz, set in a carbonate matrix and cement, no visual porosity, no shows.
1535 - 1540m	60 20 20	CALCISILTITE: as above. CALCILUTITE: as above. CALCAREOUS SANDSTONE.
1540 - 1545m	60 30 10	CALCISILTITE: as above. CALCILUTITE: as above. CALCAREOUS SANDSTONE.

1545 - 1550m	60	CALCISILTITE: as above.
	30	CALCILUTITE: as above.
	10	CALCAREOUS SANDSTONE.
1550 - 1555m	50	CALCISILTITE: as above.
	40	CALCILUTITE: as above.
	10	CALCAREOUS SANDSTONE.
1555 - 1560m	50	CALCISILTITE: as above.
	40	CALCILUTITE: as above.
	10	CALCAREOUS SANDSTONE.
1560 - 1565m	50	CALCISILTITE: as above.
	40	CALCILUTITE: as above.
	10	CALCAREOUS SANDSTONE.
1565 - 1570m	60	SANDSTONE: clear to white, loose quartz, medium grained, well sorted, well rounded, excellent visual porosity, no shows.
	30	CALCISILTITE: as above.
	10	CALCILUTITE: as above.
1570 - 1575m	70	SANDSTONE: as above.
	20	SILTSTONE: dark red brown, hard, angular cuttings.
	10	CALCISILTITE: cavings.
1575 - 1580m	80	SANDSTONE: as above.
	20	SILTSTONE: as above.
1580 - 1585m	80	SANDSTONE: as above.
	20	SILTSTONE: as above.
1585 - 1590m	95	SANDSTONE: clear, medium to coarse grained, as above.
	5	SILTSTONE: as above.
1590 - 1596m	95	SANDSTONE: as above.
	5	SILTSTONE: as above.
	trace	SHALE: dark red brown, subfissile, carbonaceous.
1596 - 1600m	60	COAL: black, subfissile, brittle.
	20	SILTSTONE: as above.
	10	SHALE: as above.
	10	SANDSTONE: as above.
1600 - 1610m	50	SANDSTONE: as above; clear to white, loose quartz, trace pyrite and silica cement, medium to coarse grained, very coarse in parts, rounded to well rounded, poorly sorted, good inferred porosity, no shows.
	20	CALCISILTITE: as above; cavings.
	20	CALCILUTITE: as above; cavings.
	10	SILTSTONE: as above.
1610 - 1620m	80	SANDSTONE; light grey to white, translucent to opaque, medium to coarse grained, very coarse in parts, rounded, to well rounded, loose quartz, very poorly sorted, silica cement in parts, trace finely crystalline pyrite in cracks/fractures and coating some grains, excellent visual porosity, no shows.
	10	CALCISILTITE: as above; cavings, trace microfossils.
	5	COAL: as above; cavings.
	5	SILTSTONE: as above.

1620 - 1630m	90	SANDSTONE: as above; poorly sorted, common silica cement, good visual porosity, no fluorescence, no shows; trace finely crystalline pyrite to disseminated aggregates.
	5	CALCISILTITE: as above; trace microfossils, glauconite pellets.
	5	SILTSTONE: as above; carbonaceous, micaceous, argillaceous.
1630 - 1635m	50	SANDSTONE: semi opaque to clear, subangular to well rounded, poorly sorted, good visual porosity, no shows.
	25	COAL: grey black to black, subvitreous, conchoidal fractures, blocky, grading to interbedded with carbonaceous siltstone.
	15	CARBONACEOUS SILTSTONE: pale brown-olive grey, medium dark grey, micaceous, carbonaceous, arenaceous in parts, soft to moderately firm, becoming brittle when grading to earthy coal.
	10	CALCISILTITE: as above; trace microfossils - mineral (calcite) fluorescence, trace pyrite.
1635 - 1640m	65	SANDSTONE: clear to semi opaque, medium grained, occasionally very coarse, moderately well sorted, subrounded, good visual porosity, no shows.
	20	COAL: as above.
	10	SILTSTONE: as above.
	5	CALCISILTITE: as above; trace microfossils.
1640 - 1645m	60	SANDSTONE: clear to semi opaque, medium grained, coarse to very coarse grained in part, moderately well sorted, subrounded, loose quartz grains, good inferred porosity, no shows.
	20	CALCISILTITE: greenish grey to medium light grey, soft to moderately firm, finely ground skeletal fragments, very calcareous, grading to calcilutite, trace finely disseminated pyrite, microfossils.
	10	CLAYSTONE: light grey, very dispersive, very soft.
	5	COAL: as above.
	5	SILTSTONE: as above.
1645 - 1650m	60	SANDSTONE: clear to semi translucent, medium grained, occasionally coarse, moderately well sorted, no shows.
	40	CALCISILTITE: as above; firm to well cemented (dolomite) in parts - cavings?, trace pyrite aggregates, microfossils.
1650 - 1655m	80	SANDSTONE: as above; occasionally very well cemented (pyrite) aggregates, predominantly loose quartz, good visual porosity, no shows.
	15	CALCISILTITE: as above.
	5	SILTSTONE: as above; occasionally arenaceous, trace pyrite aggregates, rare glauconite, coarse muscovite.

1655 - 1660m	100	SANDSTONE: white to light grey, opaque to semi translucent, very coarse to coarse grained, grading to medium grained, well rounded to very well rounded, loose quartz grains, good sphericity, some very coarse grains consist of well rounded medium grained silica cemented aggregates, grain outlines defined by finely disseminated pyrite, moderately well sorted, excellent visual porosity, no fluorescence, no shows.
	trace	CALCISILTITE, COAL and SILTSTONE.
1660 - 1665m	90	SANDSTONE: clear to semi opaque, medium to coarse grained, very coarse to granular in part, predominantly rounded to well rounded grains, (coarse grains), subrounded (medium grains), moderate sphericity, moderately to poorly sorted, coarse, well rounded grains appear to be aggregates to silica cemented as above, unconsolidated, very good visual porosity, no shows.
	5	CALCISILTITE: trace pyrite.
	5	SILTSTONE: as above.
1665 - 1670m	40	SANDSTONE: as above; good visual porosity, trace pyrite cemented aggregates, no fluorescence, no shows.
	20	COAL: as above.
	20	CARBONACEOUS SILTSTONE: grading to earthy coal.
	20	CALCISILTITE: as above; trace glauconite.
1670 - 1675m	70	SANDSTONE: as above; increasing finer fraction, pyrite cement in parts, good visual porosity, no shows.
	25	SILTSTONE: light grey to yellow brown, arenaceous, micaceous, very fine grained quartz framework, soft, very friable, grading to fine grained sandstone, pyritic and carbonaceous in parts, often as laminae.
	5	CALCISILTITE: as above.
1675 - 1680m	95	SANDSTONE: medium grained, occasionally coarse, rarely very coarse, loose quartz, well sorted, clear to semi translucent, rounded to subrounded, trace silica cement, very good visual porosity, no fluorescence, no shows.
	5	SILTSTONE: arenaceous, micaceous, becoming less carbonaceous, as above.
	trace	PYRITE AGGREGATES and CALCISILTITE.
1680 - 1690m	90	SANDSTONE: semi translucent, coarse grained, becoming very coarse grained, poorly sorted, rounded to well rounded, moderately well frosted grains, predominantly loose, occasional friable fine grained aggregates and pyrite cemented aggregates, good visual porosity, no shows.
	10	SILTSTONE: as above.
1690 - 1695m	95	SANDSTONE: as above; semi opaque to white, excellent visual porosity.
	5	SILTSTONE: as above.
	trace	PYRITE and CALCISILTITE.

1695 - 1700m	95	SANDSTONE: white, opaque, rarely clear, loose quartz grains, medium to coarse to very coarse grained, moderately well sorted, rounded to well rounded, occasionally fractured, common well rounded silica cemented composite grains, trace disseminated pyrite - also as a cement, excellent visual porosity; no fluorescence, no shows.
	5	SILTSTONE: as above.
1700 - 1705m	90	SANDSTONE: semi translucent to white, medium to coarse to very coarse grained, well rounded, trace feldspars, (degraded), excellent visual porosity, no shows.
	5	CALCISILTITE: as above.
	5	SILTSTONE: as above.
1705 - 1710m	95	SANDSTONE: clear to white translucent, coarse to very coarse grained, well sorted, well rounded to subangular.
	5	SILTSTONE: as above.
	trace	PYRITE AGGREGATES.
1710 - 1715m	75	SANDSTONE: as above.
	10	COAL: black, as above.
	5	SILTSTONE: as above.
	trace	PYRITE: as above.
1715 - 1720m	90	SANDSTONE: as above.
	5	SILTSTONE: as above.
	5	COAL: as above.
	trace	PYRITE: as above.
1720 - 1725m	95	SANDSTONE: as above.
	5	SILTSTONE: as above.
	trace	PYRITE: as above.
1725 - 1730m	90	SANDSTONE: clear to translucent white, coarse to very coarse loose quartz; subangular to well rounded; well sorted; excellent visual porosity; no shows.
	10	SILTSTONE: tan to red brown, hard, angular fragments.
	trace	COAL.
	trace	PYRITE.
1730 - 1735m	90	SANDSTONE: as above; coarse to medium grained.
	10	SILTSTONE: as above.
	trace	COAL.
	trace	PYRITE.
1735 - 1740m	90	SANDSTONE: as above; medium to fine grained.
	10	SILTSTONE: as above.
	trace	PYRITE.
1740 - 1745m	90	SANDSTONE: as above; fine to medium grained.
	10	SILTSTONE: as above.
	trace	PYRITE.
1745 - 1750m	90	SANDSTONE: as above; fine grained.
	10	SILTSTONE: as above.
	trace	PYRITE.

1750 - 1754m	90	SANDSTONE: clear to white; medium grained, grading to coarse, occasionally very coarse; subrounded to rounded; moderately well sorted; predominantly loose; frequently very hard, very well cemented (pyrite) aggregates.
	5	SILTSTONE: as above.
	5	CALCISILTITE: medium light grey, very soft; dispersive; argillaceous; calcareous
	Trace	PYRITE:
1754m-1760m	60	SANDSTONE: clear to white, medium to coarse grained; subrounded; moderately well sorted; common silica cemented coarse aggregates - lithofragments, rare pyrite cemented aggregates; predominantly loose quartz, trace feldspar, muscovite. Good visual porosity; no shows.
	25	CALCISILTITE: as above; medium light grey; calcareous; moderately firm; skeletal debris in matrix.
	10	SILTSTONE: argillaceous, carbonaceous, micaceous arenaceous in parts; moderately firm, massive-laminated, occasionally subfissile grading to shale.
	5	COAL: dark grey-black, blocky, vitreous, conchoidal fracture.
1760m-1765m	Trace	PYRITE: Glauconitic sandstone; microfossils.
	85	SANDSTONE: clear to white, coarse to very coarse grained; well rounded to subrounded; loose quartz, trace feldspar; moderately well sorted; excellent visual porosity; no shows.
	10	CALCISILTITE: as above.
	5	SILTSTONE: as above.
1765m-1770m	Trace	COAL: microfossils, pyrite.
	65	SANDSTONE: clear to white, coarse to very coarse grained; common hard, pyrite cemented aggregates. Very good visual porosity; no shows.
	20	CALCISILTITE: as above.
	10	PYRITE: microcrystalline aggregates, often cementing subangular; clear quartz grains.
1770m-1775m	Trace	Coal, glauconite, microfossils.
	25	SILTSTONE: pale brown-olive grey, argillaceous, micaceous, carbonaceous inclusions; plant impressions common, soft to very soft, sub blocky to rounded.
	35	SHALE: carbonaceous, subfissile, medium dark grey, firm, slivered texture, brittle/sub-blocky, grading to earthy coal in parts.
	10	COAL:
1775-1780m	20	CALCISILTITE: as above.
	10	SANDSTONE: Loose quartz, medium to coarse grained; no shows.
	10	SHALE: as above.
	10	SILTSTONE: as above.
1775-1780m	15	COAL: as above.
	5	CALCISILTITE: as above.
	Trace	PYRITE:

1780-1785m	100	SANDSTONE: white to clear; coarse to very coarse grained; sub-angular to subrounded; low sphericity; moderately sorted, common silica cemented composite coarse grains; trace dolomite cement, unconsolidated quartz plus minor feldspar; good visual porosity; no shows.
	Trace	COAL, SHALE, SILTSTONE.
1785-1790m	70	SILTSTONE: olive grey-brown grey, medium dark grey, argillaceous, micaceous, carbonaceous laminae/inclusions; soft to firm, brittle in parts, blocky to sub vitreous, grading to carbonaceous shale.
	20	COAL: dark grey to grey black, dull becoming subvitreous, earthy, blocky, rare conchoidal fracture, grading to carbonaceous shale.
	5	CALCISILTITE: as above.
	5	SANDSTONE: as above.
1790-1795m	50	SHALE: medium dark grey, carbonaceous, sub-fissile to fissile, dull to waxy lustre, grading to earthy coal.
	20	COAL: grey black to black, as above.
	25	SILTSTONE: as above micaceous, phyllitic, carbonaceous inclusions.
	5	SANDSTONE:
1795-1800m	75	SANDSTONE: white to light grey, medium coarse to very coarse grained; subrounded; low sphericity; moderately well sorted; loose quartz; trace silica cement; good visual porosity, trace dull, pale orange mineral fluorescence; no shows.
	10	SHALE: alternating laminae of coal/silt.
	10	SILTSTONE: as above.
	5	COAL:
1800-1805m	40	SANDSTONE: clear to white, medium to coarse grained, very coarse in part; subrounded to subangular; silica cemented coarse grains, poorly sorted, good visual porosity; Trace even, bright orange fluorescence in friable very fine grained aggregate; instant milky white streaming cut.
	15	COAL: as above interbedded with carbonaceous shale, trace bright pale yellow mineral (amber?) fluorescence.
	30	SHALE: as above.
	15	SILTSTONE: as above.
	Trace	CALCISILTITE.
1805-1810m	50	SANDSTONE: as above; good visual porosity; no shows.
	20	SILTSTONE: medium grey, yellow brown to pale brown, carbonaceous, argillaceous, micaceous, subfissile in parts, soft to becoming firm to brittle, grading to carbonaceous shale.
	15	SHALE: common plant impressions as above.
	15	COAL: as above.
1810-1815m	80	SANDSTONE: clear to white, medium to coarse grained, subrounded, low sphericity, moderately sorted, loose quartz, minor feldspar, occasional silica cemented coarse composite grains very good visual porosity; no shows.
	5	SHALE: as above.
	10	SILTSTONE: as above.
	5	COAL: as above.

1815-1820m	100	SANDSTONE: white, medium to coarse grained, subrounded, very coarse grained in parts, pressure dissolution between compacted quartz grains, loose quartz, occasional silica cement, trace pyrite cement; very good visual porosity; no shows.
	Trace	SILTSTONE
1820-1825m	100	SANDSTONE: as above common silica cement; very good visual porosity; trace feldspar; no shows.
1825-1830m	100	SANDSTONE: Light grey-white, semi translucent, medium light grey, coarse to very coarse grained, subrounded to rounded, poorly sorted, loose quartz, common silica cemented compound grains; minor feldspar; abundant (15-20%) pyrite-finely disseminated, around sub-grains within composite quartz/degraded feldspars; Good visual porosity; no shows.
1830-1835m	90	SANDSTONE: quartz, pyrite, feldspar; as above, subangular to subrounded, good visual porosity; no shows; Trace dull orange mineral (dolomite) fluorescence.
	10	SILTSTONE: micaceous, argillaceous, yellow brown fluorescence; pale brow, soft to moderately firm.
1835-1840m	95	SANDSTONE: white to translucent, very coarse grained to granular, predominantly loose quartz, minor feldspar, abundant disseminated pyrite also as a cement, silica cement common, subrounded to rounded, occasional fractured grains, moderately sorted, good visual porosity; no shows.
	5	SILTSTONE: as above.
1840-1845m	90	SANDSTONE: coarse to very coarse as above.
	10	SILTSTONE: as above.
1845-1850m	95	SANDSTONE: medium grained, clear to white, occasionally granular, very poorly sorted, subrounded to rounded, loose quartz, minor feldspar, trace disseminated pyrite, trace silica cement, very good visual porosity; no shows.
	5	SILTSTONE: light grey, micaceous, argillaceous moderately firm, occasionally calcareous.
1850-1855m	100	SANDSTONE: fine to medium grained, subangular to subrounded, well sorted occasional quartz granules; trace muscovite, pyrite; very good visual porosity; no shows.
	Trace	CLAYSTONE, SILTSTONE:
1855-1860m	100	SANDSTONE: quartz, muscovite, feldspar, fine to medium grained subangular, occasional well rounded granules, well sorted, loose quartz, abundant coarse to medium muscovite flakes, common finely disseminated pyrite; good visual porosity; no shows.

1860-1865m	95	SANDSTONE: clear to white, fine to medium grained, subangular to subrounded, moderately sorted frequent coarse to very coarse grains, loose quartz, abundant muscovite, minor feldspar; good visual porosity; no shows.
	5	SILTSTONE: as above.
	Trace	Disseminated pyrite.
1865-1870m	Trace	Dull orange mineral fluorescence (dolomite).
	100	SANDSTONE: quartz, muscovite, clear to semi translucent, moderately well sorted, subangular to subrounded, fine grained trace disseminated pyrite, predominantly loose grains, trace silica, dolomite and pyrite cemented aggregates; good visual porosity; no shows.
	Trace	SILTSTONE: as above, glauconite.
1870-1875m	95	SANDSTONE: clear to translucent white loose quartz, fine to medium grained, moderately sorted, subangular to subrounded, some finer aggregates in calcareous matrix, excellent visual porosity; no shows.
	5	SILTSTONE: light grey to light brown, firm, carbonaceous micaceous.
	Trace	PYRITE:
	Trace	GLAUCONITE:
1875-1880m	40	SANDSTONE: as above.
	50	SILTSTONE: red brown to green grey firm to hard, calcareous and siliceous cement; common glauconite and, pyrite inclusions block to angular fragments; grades to fine sandstone
	10	COAL: black, cavings.
1880-1885m	60	SANDSTONE: as above.
	35	SILTSTONE: as above.
	5	COAL: as above.
1885-1890m	40	SANDSTONE: as above.
	55	SILTSTONE: as above.
	5	COAL: as above.
1890-1895m	60	SANDSTONE: medium brown to grey to grey green; firm to hard angular to rounded cuttings; quartzose with common pyrite; glauconite and carbonaceous material, rarely micaceous, dominantly silisic cement commonly calcareous grades to fine sandstone.
	40	SANDSTONE: fine to coarse grained, loose quartz poorly sorted, angular to subrounded, medium to poor visual porosity; no shows.
	Trace	COAL:
1895-1890m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
	Trace	PYRITE:
1900-1905m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
	Trace	PYRITE: as above.
1905-1910m	90	SANDSTONE: as above dominantly fine to medium grained; moderately sorted.
	10	SILTSTONE: as above dominantly grey.

1910-1915m	90	SANDSTONE: as above dominantly fine grained well sorted.
	10	SILTSTONE: as above.
1915-1920m	100	SANDSTONE: as above fine to medium grained.
	Trace	SILTSTONE:
1920-1925m	100	SANDSTONE: as above.
	Trace	SILTSTONE: as above.
1925-1930m	100	SANDSTONE: clear to white or translucent quartz, fine to medium grained, well sorted, subrounded to subangular grains, loose, excellent visual porosity, no shows.
	Trace	SILTSTONE: medium to dark grey, firm to hard.
	Trace	PYRITE:
1930-1935m	70	SANDSTONE: clear to white, predominantly translucent quartz, minor feldspar, medium grained grading to coarse, occasionally fine grained, moderately sorted, subangular to subrounded, loose grains, trace fine grained very friable aggregates with coarse silt matrix, very good visual porosity; no shows.
	30	SILTSTONE: light grey, green grey, medium dark grey to yellow brown, micaceous, argillaceous, common carbonaceous inclusions, often calcareous, moderately firm, subfissile grading to shale in parts.
	Trace	COAL:
1935-1940m	100	SANDSTONE: white to clear, medium to coarse grained, very coarse in parts, subrounded, low sphericity, poorly sorted, loose quartz, minor feldspar, trace silica cement, finely crystalline pyrite coating some grains, excellent visual porosity; no shows.
	Trace	SILTSTONE: coal, pyrite.
1940-1945m	40	SANDSTONE: as above poorly sorted, occasional fine grained very friable aggregates, trace pyrite cement, excellent visual porosity; no shows.
	30	COAL: grey black to black, dull; sub vitreous, blocky, occasional conchoidal fracture, earthy, grading to carbonaceous shale.
	30	SILTSTONE: brown grey to medium dark grey, sub blocky, firm to brittle, subfissile grading to carbonaceous shale.
	Trace	PYRITE: claystone.
1945-1950m	70	SILTSTONE: as above very carbonaceous.
	20	SANDSTONE: clear to white, medium to very coarse grained, frequently very fine grained (as friable aggregates), subrounded, poorly sorted, pyrite cement in parts, very good visual porosity; no shows.
	10	COAL: as above.
	Trace	PYRITE: rare microfossils.
1950-1955m	70	SANDSTONE: clear to white, medium to coarse grained, frequently granular, poorly sorted, loose quartz, minor feldspar, subangular to subrounded, trace silica/pyrite cements, good visual porosity; no shows.
	30 Trace	SILTSTONE: as above. COAL: very fine grained friable sandstone, pyrite.

1955-1960m	95	SANDSTONE: white to clear, medium grained, grading to coarse to very coarse, common fine grained very friable aggregates, subrounded to well rounded, well frosted, trace silica/pyrite cements, loose quartz minor feldspar, excellent visual porosity; no shows.
	5	SILTSTONE: brown grey to medium dark grey, carbonaceous, micaceous, rarely calcareous, arenaceous grading to finely grained sandstone.
	Trace	PYRITE:
1960-1965m	80	SANDSTONE: clear to white, medium to coarse grained, subangular to subrounded, poorly sorted, loose quartz, minor feldspar, common silica cement; good visual porosity; no shows. Trace pyrite/ dolomite cement.
	20	SILTSTONE: brown grey to medium grey, micaceous, carbonaceous in part, block to rounded cuttings, firm to friable, arenaceous grading to fine grained sandstone.
	Trace	PYRITE: coal.
1965-1970m	80	SANDSTONE: white to clear, coarse to very coarse grained, subrounded to rounded, poorly sorted, well frosted in parts, loose quartz, common silica cement, trace fine grained friable aggregates, trace pyrite cement; good visual porosity; no shows.
	20	SILTSTONE: as above carbonaceous laminae.
	Trace	COAL: pyrite, glauconite, chert.
1970-1975m	90	SANDSTONE: medium grained, grading coarse to very coarse, clear to white, subangular to subrounded, poorly sorted, loose quartz, minor muscovite, feldspar rare chert, common silica cement, occasional firm to friable, fine to medium grained aggregates. Good visual porosity; no shows.
	10	SILTSTONE:
	Trace	COAL: glauconite, plant remains.
1975-1980m	80	SANDSTONE: coarse grained, subangular, white to translucent, poorly sorted, loose quartz, common silica cement, trace pyrite cement, occasional fine to medium grained, firm aggregates; silica cement; good visual porosity; no shows.
	15	SILTSTONE: light grey to medium dark grey, carbonaceous, arenaceous grading to fine grained sandstone, firm to friable calcareous in part, hard, blocky to rounded cuttings.
	5	CLAYSTONE: Olive grey to medium light grey, sticky dispersive in water, calcareous, coagulates in dilute HCL.
	Trace	Chert, glauconite, pyrite, carbonaceous matter.
1980-1985m	70	SANDSTONE: i) 30% white to light grey, fine to very fine grained, subangular, clear, moderately well sorted, poorly sorted, framework supported aggregates of quartz, minor pyrite, feldspar mica in parts, occasional glauconite to siliceous matrix/ non calcareous firm to friable, hard where pyrite cement/matrix; no visual porosity; no shows. ii) 70% clear to white, coarse to very coarse grained moderately sorted, subangular to subrounded, low sphericity, loose quartz, trace silica cement, excellent visual porosity; no shows.

1980-1985m (continued)	30	SILTSTONE: brown-grey to pale brown, medium grey, as above grading to very fine grained sandstone as in (i) above.
	Trace	PYRITE: glauconite, claystone.
1985-1990m	90	SANDSTONE: clear to translucent, medium grained, coarse to very coarse in parts, occasional fine to very fine grained aggregates grading to arenaceous quartz/mica siltstone, subangular to subrounded, loose quartz, moderately sorted, occasional muscovite flakes/booklets, excellent visual porosity; no shows.
	10 Trace	As above. PYRITE: glauconite, chert.
1990-1995m	100	SANDSTONE: white to translucent, coarse grained, subangular to subrounded, moderate sorting, loose quartz, minor feldspar, chert, muscovite, rare chlorite, trace fine grained friable aggregates, Trace pyrite cement; excellent visual porosity; no shows.
	Trace	SILTSTONE:
1995-2000,	100	SANDSTONE: white to translucent, coarse grained, moderate sorting, subangular, loose quartz, minor feldspar, chert, pyrite, rare chlorite, excellent porosity; no shows.
	Trace	PYRITE, SILTSTONE.
2000-2005m	100	SANDSTONE: white to translucent, medium to coarse to very coarse grained, poorly sorted, subangular to subrounded, loose quartz, minor feldspar, chert, pyrite (cement), rare chlorite, occasional friable aggregates.
	Trace	PYRITE, muscovite, siltstone.
2005-2010m	100	SANDSTONE: medium grained, coarse to very coarse in parts, clear to translucent, subangular to subrounded, moderately sorted, loose quartz, minor chert, feldspar, pyrite, occasional fine grained friable aggregates, excellent visual porosity; no shows.
	Trace	SILTSTONE (coal inclusions), shale, pyrite.
2010-2015m	95	SANDSTONE: clear to translucent, medium to coarse to very coarse grained, subrounded to subangular, poorly sorted, loose quartz, feldspar, minor chert, pyrite, excellent visual porosity; no shows.
	5	SILTSTONE: pale brown to medium grey, firm, blocky to rounded cuttings.
2015-2020m	95	SANDSTONE: white to translucent, fine to medium grained, coarse to granular, very poorly sorted, subangular to subrounded, loose quartz, minor feldspar, white micas, pyrite, rare glauconite, chlorite, Trace well cemented (silica/pyrite) aggregates; no shows.
	5	SILTSTONE: white to silver in parts, micaceous, siliceous, firm.

2020-2025m	95	SANDSTONE: clear to translucent, medium to coarse to very coarse grained, poorly sorted, subangular, low sphericity, loose quartz, minor feldspar, chert, silicified fine grained sandstone, trace pyrite cemented aggregates, common silica cement, good visual porosity; no shows.
	5 Trace	SILTSTONE: as above. PYRITE: planktonic foraminifera, glauconite (poor sample recovery).
2025-2030m	95	SANDSTONE: clear to white, medium to coarse grained, moderate sorting, subangular to subrounded, loose quartz, feldspar, trace pyrite cement, good visual porosity; no shows.
	5	SILTSTONE: as above.
2030-2035m	90	SANDSTONE: clear to white, medium to coarse grained, subangular in part, low sphericity, moderate sorting, loose quartz, minor feldspar, chert, mica, rare chlorite, trace pyrite cement.
	10	SILTSTONE: green grey to medium light grey, brown grey to medium dark grey, firm, carbonaceous in part, micaceous in part, firm, occasionally calcareous.
	Trace	Skeletal carbonaceous fragments, pyrite glauconite, white mica booklets, carbonaceous material, iron concretian.
2035-2039.5m	80	SANDSTONE: clear to white, medium to coarse grained, subrounded, moderately sorted, loose quartz, minor feldspar, chert, common pyrite cemented aggregates, fine grained silica cemented aggregates; good visual porosity; no shows.
	20	SILTSTONE: medium dark grey to pale brown, firm, blocky, carbonaceous grading to shale, non-calcareous.
	Trace	PYRITE: glauconite, carbonaceous material. Trip for new bit /BHA.
2039.5-2045m	50	CALCISILTITE: medium light grey to greenish grey, firm, carbonate mud matrix supporting comminuted skeletal carbonate framework; trace glauconite (cavings).
	40	SANDSTONE: clear to translucent, medium to coarse grained, subangular, poorly sorted, loose quartz; good visual porosity; no shows.
	10	SILTSTONE: pale brown to medium grey, rounded cuttings, moderately firm, micaceous/carbonaceous in part; non calcareous.
	Trace	GLAUCONITE: Microfossils (abundant-loose) weathered volcanics (limonite pellets) pyrite, ferruginised/silicified shale, rare chlorite booklets.
2045-2050m	65	SANDSTONE: white to translucent, medium to very coarse grained, poorly sorted, subangular to subrounded, occasionally angular, low sphericity, loose quartz, minor feldspar, chert, trace fine grained aggregates; well cemented (silica) to friable with glauconite inclusions; very good visible porosity; no shows.
	30 Trace	SILTSTONE: glauconitic in parts. GLAUCONITE: microfossils, skeletal carbonate fragments, limonite pellets pyrite chert.

2050-2055m	90	SANDSTONE: white to translucent, clear in parts, medium to coarse to very coarse grained, poorly sorted, subangular, frequently angular or subrounded, loose quartz; often shattered, extensive silica cementation, minor pyrite cement, trace chert, trace quartz grains with pyrite and chlorite? inclusions; fair visual porosity; no shows.
	5	CALCISILTITE:
	5	SILTSTONE:
	Trace	GLAUCONITE: calcareous claystone, microfossils, limonite pellets, altered volcanic rock fragments.
2055-2060m	90	SANDSTONE: (conglomerate) white to clear, coarse to very coarse grained, granular in parts, subangular to subrounded, poorly sorted, low sphericity, often shattered grains, loose quartz grains; extensive silica cementation; minor chert; pyritined/silicified fine to medium grained brecciated rock fragments. Trace feldspar (decaying), pyrite cement, Fair to good visual porosity; no shows.
	10	CALCISILTITE: as above.
	Trace	SILTSTONE: arenaceous, quartzitic, glauconitic grading to fine grained sandstone.
	Trace	Glauconite, limonite pellets, altered volcanics, pyrite fine grained friable sandstone.
2060-2065m	100	SANDSTONE: (Conglomerate) clear-white, coarse to very coarse granular, subangular to subrounded, moderately sorted, loose quartz, minor chert, feldspar, common silica cemented fine grained aggregates; good visual porosity; no shows.
	Trace	GLAUCONITE: (pyrite, altered volcanics, silicified breccia, microfossils, siltstone).
2065-2070m	90	CONGLOMERATE: as above.
	10	CALCISILTITE: as above.
	Trace	Chert, pyrite, siltstone, skeletal carbonate fragments, limonite pellets, microfossils.
2070-2075m	90	CONGLOMERATE: as above, cavings from slow drilling; samples since trip heavily contaminated with cavings.
	10	ALTERED VOLCANICS: cream-yellow brown, light grey, pale green, random acicular crystal texture, weathered groundmass, rarely crystalline, firm, soft where very weathered.
	Trace	CLAYSTONE: cream/buff to pale green very sticky.
	Trace	CHERT: pyrite, limonite pellets, microfossils.
2075-2080m	85	COARSE SANDSTONE: quartzose, grainsize, medium to granule, poorly sorted abundant silica pelloids otherwise as above (translucent amber-cream pelloids; concentric laminae; non calcareous).
2080-2085m	30	SANDSTONE: (Coarse) quartzose, translucent, coarse; granular; poorly sorted, as above.
	70	ALTERED VOLCANICS: pale mauve, pale green, cream buff, firm grading to moderately soft, various weathered/leached states (function of colour), Acicular crystals (quench texture) random orientation, frequently aligned in parallel layers (suggests tuffaceous, acidic extrusive).

2080-2085m (cont)		Abundant spherules of concentric layered silica, single spheres and aggregates often covered by a continuous silica coating (translucent). Various grain sizes; medium; very coarse. Becoming ferruginised with depth ie. ironoxide coating. Probably a weathering product of volcanics. Very sticky clay washing out, decreasing with depth. PYRITE:
	Trace	
2085-2090m	90	ALTERED VOLCANICS: Emerald jade-green, red brown-greyish red, very firm to friable (function of weathered state), glassy crystalline groundmass, weathered/oxidised framework of relict crystals (phenocrysts?). Extensive secondary mineralisation especially green silicate mineral (Serpentine?) often in voids/vesicles & in alternating concentric laminae with silica/calcite, Else as above.
	10	COARSE SANDSTONE: quartzose as above.
2090-2095m	100	ALTERED VOLCANICS: generally fresher, extensive 'serpentinisation, secondary mineralisation in vesicles/veins eg. calcite, relict phenocrysts (amphiboles?), suggest more basic volcanics.
	Trace	QUARTZ SANDSTONE: coal; rounded cuttings.
2095-2100m	100	ALTERED VOLCANICS: extensive serpentinization, calcite veins/vesicle infillings abundant weathered tuffaceous material; common silica spherules, common oxidised iron minerals.
	Trace	SILTSTONE: coarse quartz.
2100-2105m	100	ALTERED VOLCANICS: as above, common concentric silica spherules.
	Trace	QUARTZ: extensive clay washing out of samples.
2105-2110m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE: loose quartz as above.
2110-2115m	100	ALTERED VOLCANICS: generally fresher appearance, extensive serpentine, common calcite.
	Trace	CLAYSTONE: quartz, pyrite.
2115-2120m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE CAVINGS: as above.
2120-2125m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE CAVINGS: as above.
2125-2130m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE CAVINGS: as above.
2130-2135m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE CAVINGS: as above.
2135-2140m	100	ALTERED VOLCANICS: as above.
	Trace	SANDSTONE CAVINGS: as above.
2140-2145m	100	ALTERED VOLCANICS: as above extensive oxidation, secondary mineralisation eg. calcite, serpentine, malachite?
	Trace	QUARTZ: grit as above.
2145-2150m	100	ALTERED VOLCANICS: as above. Secondary mineralisation often is concentric layers indicating growth in voids/vesicles.

2150-2155m	100	ALTERED VOLCANICS: as above.
2155-2160m	100	ALTERED VOLCANICS: as above.
2160-2165m	100	ALTERED VOLCANICS: medium grey to greyish red, moderately firm, silt sized, weathered/leached else as above.
2165-2170m	100	ALTERED VOLCANICS: very oxidised; grey-red to medium grey, relict igneous texture; weathered to silty clay.
	Trace	CALCITE SHPERCULITES: aragonite/calcite veins, Quartz.
2170-2715m	100	ALTERED VOLCANICS: as above.
	Trace	QUARTZ:
2175-2180m	100	ALTERED VOLCANICS: as above. Common white sparry calcite crystals/spherulites.
2180-2185m	100	ALTERED VOLCANICS: common sparry calcite crystals, spherulites, veins else as above.
2185-2190m	100	ALTERED VOLCANICS: common calcite mineralisation.
2190-2195m	100	ALTERED VOLCANICS: abundant calcite mineralisation as above.
2195-2200m	100	ALTERED VOLCANICS: abundant calcite mineralisation as above.
2200-2205m	100	ALTERED VOLCANICS: Copious calcite mineralisation as above.
2205-2210m	100	ALTERED VOLCANICS: as above; trace loose quartz.
2210-2211m	95	ALTERED VOLCANICS: as above.
	5	SANDSTONE: medium to fine grained, subangular to subrounded, well sorted.
2211-2213m	95	ALTERED VOLCANICS: as above.
	5	SANDSTONE: as above. Depth correction after strapping out for core (+3m)-
2216-2222m		See Core #1 Desc.
2222-2231m		See Core #2 Desc.
2231-2235m	80	SILTSTONE: light to medium grey; firm to moderately hard; quartzose; slightly argillaceous; very slightly carbonaceous.
	20	SANDSTONE: Hard, angular silica cemented fragments; no shows; no visible porosity.
	Trace	ALTERED VOLCANICS: cavings.
2235-2240m	75	SANDSTONE: 75% C-VC quartz grains and occasional aggregates, A-SR, strongly silica cemented, most grains have angular broken faces, trace pyrite cement, clear to colourless; no visible porosity; no shows.
	20	20% light grey siltstone, slightly carbonaceous, soft trace pyrite.
	5	5% volcanics and other cavings.

2240-2245m	85	SANDSTONE: fine to very coarse grained angular fragments of totally silica cemented milky white quartz. Trace pyrite cemented fine grained sandstone aggregates. Very hard; no shows; no visible porosity.
	15	SILTSTONE: Light grey, firm, slightly argillaceous, slightly carbonaceous, slightly to moderately calcareous.
	Trace	ALTERED VOLCANICS: cavings.
2245-2250m	90	ALTERED VOLCANICS: Emerald green serpentinites/chlorites and Fer-oxide red browns, most cuttings show moderately well formed microcrystalline texture's while some show extensive weathering - ie concentric chlorites Serpentine and Fe Oxide banding, calcite veining etc. Soft to firm, clay rich in parts.
	10	SANDSTONE: Milky white coarse grained highly angular fragments. Very hard, strong silica cement; no shows no visible porosity.
2250-2255m	95	VOLCANICS as for 2245-2250m. No fluorescence.
	5	Medium to very coarse grains, occasional medium grained pyritised aggregates.
	Trace	Light grey siltstone.
2255-2260m	95	VOLCANICS as for 2245-2250m. No fluorescence.
	5	Coarse to very coarse quartz grains, some fine grained aggregates, trace pyrite.
2260-2265m	95	ALTERED VOLCANICS: as above dominantly finely crystalline.
	5	SANDSTONE: As above; no fluorescence; now shows.
2265-2270m	95	ALTERED VOLCANICS: as above.
	5	SANDSTONE: as above.
2270-2273m	93	ALTERED VOLCANICS: as above.
	7	Medium quartz grains.
2273-2275m	90	ALTERED VOLCANICS: as above.
	10	SANDSTONE: medium grained, clear quartz, with strong silica cement; poor visible porosity; no shows.
2275-2281m	20	SANDSTONE: fine to medium grained, moderately hard clear silica cement, poor to occasionally fair visible porosity; no fluorescence or cut, subangular to subrounded; moderately well sorted.
	80	ALTERED VOLCANICS: as above.
2281-2361.5m		See core descriptions for core's 3,4,5,6,7,8.
2361.5-2365m	60	SILTSTONE: Medium light grey to medium dark grey to brown quartzose, slightly argillaceous, slightly carbonaceous in parts, slightly sandy in parts, minor carbonaceous laminae. Firm to moderately hard.
	40	SANDSTONE: 2 types: Type 1, angular, milky white to translucent fragments, shattered very coarse grains, highly silica cemented quartz sandstone fragments: Type 2, fine to medium grained, subangular to subrounded, moderately well sorted aggregates with weak to moderately strong silica cement, poor to occasionally good visual porosity. Common Volcanics/Igneous cavings.

2365-2370m	80	SILTSTONE: as above, occasionally friable grading to fine grained sandstone.
	20	SANDSTONE: medium, coarse to very coarse grained, translucent to opaque, subrounded, occasionally shattered, moderately well frosted, low sphericity, loose, common silica cemented aggregates, fair visual porosity; trace pyrite cement; common altered igneous rock fragments (chlorite, calcite, serpentine).
2370-2375m	60	SANDSTONE: medium to very coarse grained, subangular, clear to translucent, frequently shattered/splintered, occasionally moderately frosted, poorly sorted.
	40	SILTSTONE: as above, grading to very fine grained sandstone in part.
	Trace	IGNEOUS FRAGMENTS: pyrite, claystone, coal, microfossils.
2375-2380m	30	SANDSTONE: Sandstone common silica cement, trace pyrite cement, very poor to poor visual porosity. Trace fine grained aggregates; well cemented.
	70	SILTSTONE: pale green, medium light grey, olive grey, soft to moderately firm, argillaceous, slightly carbonaceous, trace quartz, trace mica.
	Trace	IGNEOUS FRAGMENTS: extensively altered, pyrite, skeletal fragments.
2380-2385m	70	SANDSTONE: translucent to opaque, medium to very coarse grained, subangular to angular, shattered/splintered grains, abundant silica cement, poorly sorted, low sphericity, very poor to poor visual porosity, occasional fine grained friable to firm aggregates.
	30	SILTSTONE: light grey, medium grey, olive grey to pale green, dark grey, very soft grading to sticky clay in parts, soft-friable grading to fine grained carbonaceous/quartz sandstone, firm to hard, becoming very carbonaceous.
	Trace	ALTERED IGNEOUS: (cavings?), coal, claystone.
2385-2390m	60	SANDSTONE: as above; dominantly silica cemented angular fragments; no shows.
	40	SILTSTONE: as above; carbonaceous. Minor igneous cavings.
2390-2393m	70	SANDSTONE: Predominantly argillaceous fragments of shattered coarse grained quartz grains and very strongly silica cemented sandstone. Fragments are argillaceous, very hard, milky white to translucent. Minor fine grained, well sorted, subangular to subrounded, weakly silica cemented sandstone aggregates. Poor to occasionally fair visible porosity, no shows. Trace cubic pyrite cement.
	30	SILTSTONE: Light to medium dark grey, slightly carbonaceous, slightly sandy, slightly argillaceous, firm to moderately hard. - common (5% of sample) volcanics/igneous cuttings which are probably cavings.

2393-2395m	40	SANDSTONE: fine to coarse grains, subangular to subrounded, some angular silica cemented aggregates. No shows.
	60	SILTSTONE: grey to brown, firm to hard, carbonaceous in part, also light to dark green, grey crystalline? cuttings (F.R.D.K.); possibly volcanic cavings.
	Trace	PYRITE: large coarse discrete lumps predominantly, some as cement between quartz grains.
2395-2400m	90	SANDSTONE: predominantly loose fine to medium subangular to angular quartz grains. Occasionally large quartz grains or quartz aggregates. Good porosity. No shows.
	10 Trace	SILTSTONE: as above. PYRITE: Volcnic cavings, coal and trace Mica.
2400-2405m	95	SANDSTONE: as above, no shows.
	5 Trace	SILTSTONE: as above. PYRITE: Coal.
2405-2410m	100	SANDSTONE: as above, no shows.
	Trace	SILTSTONE: Pyrite, coal.
2410-2415m	90	SANDSTONE: as above, no shows.
	10	SILTSTONE: as above.
	Trace	PYRITE: coal.
2415-2420m	90	SANDSTONE: as above, no shows.
	10	SILTSTONE: as above.
	Trace	PYRITE:
2420-2425m	90	SANDSTONE: as above, no shows.
	10	SILTSTONE: as above.
	Trace	PYRITE:
2425-2428m	90	SANDSTONE: medium light grey, opaque to translucent, medium, coarse to very coarse, subangular to subrounded, occasional fractured/splintered grains, loose quartz, frequently as fused/composite aggregates, silica cement common; no shows; fair to good visual porosity.
	10	SILTSTONE: argillaceous, micaceous, carbonaceous in parts, occasionally calcareous.
	Trace	COAL: pyrite, weathered igneous fragments.
2428m		<u>Desander Sample</u>
	100	SANDSTONE: quartz, trace mica (white), angular to subrounded; clear to translucent; well sorted; loose common silica cement; fair visual porosity; no shows.
	Trace	COAL: Coal, siltstone, pyrite.
2429.2-2439m		See Core #9 description.
2439-2440m	80	SANDSTONE: subangular to angular; medium to coarse quartz grains; no shows.
	10	SHALE: dark grey, hard, occasionally carbonaceous.
	Trace	PYRITE:

2440-2445m	40	SANDSTONE: as above, some very coarse angular grains; no shows.
	20	SHALE: as above.
	40	SILTSTONE: as above.
2445-2450m	50	SANDSTONE: as above, some fine cemented aggregates also; no shows.
	50	SILTSTONE: as above.
	Trace	SHALE: pyrite, coal.
2450-2455m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
	Trace	SHALE: Pyrite, Coal.
2455-2460m	50	SANDSTONE: as above; no shows; some very coarse grains.
	50	SILTSTONE: as above.
	Trace	SHALE: Pyrite.
2460-2465m	50	SANDSTONE: subangular to angular, transparent medium to coarse loose quartz grains; no shows.
	40	SILTSTONE: as above.
	10	SHALE: as above.
	Trace	PYRITE.
2465-2470m	50	SANDSTONE: as above, trace fluorescence and cut plus oil staining; Cavings?? (less than 5%).
	50	SHALE: as above.
2470-2475m	50	SANDSTONE: as above; no shows.
	40	SILTSTONE: as above.
	10	SHALE: as above.
2475-2480m	50	SANDSTONE: as above; no shows.
	50	SILTSTONE: as above; no shows.
2480-2485m	50	SANDSTONE: medium to coarse, occasional very coarse; trace very fine grained quartzose; moderate to poor porosity in aggregates mostly disaggregated grains, occasional aggregates; angular to subangular, trace pyrite; trace coal; no shows.
	50	SILTSTONE: medium grey-brown, trace carbonaceous flecks; no shows.
2485-2490m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2490-2495m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2495-2500m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2500-2505m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2505-2510m	60	SILTSTONE: medium grey to pale brown, trace carbonaceous flecks.
	40	SANDSTONE: medium to coarse grained trace very fine grained; subangular; trace coal.
2510-2515m	60	SILTSTONE: as above, no shows.
	40	SANDSTONE: as above.

2515-2520m	70	SANDSTONE: medium to coarse grained, quartzose, aggregates moderate to poor porosity, subangular to angular, trace pyrite.
	30	SILTSTONE: medium grey to pale brown, soft to firm, carbonaceous in parts, sub blocky to massive, grading to siltstone.
	Trace	COAL:
2520-2525m	70	SANDSTONE: predominantly medium to coarse, loose, subangular to angular quartz grains, moderately poor sorting, moderat to poor porosity. Occasionally very coarse grains, excellent sandstone aggregates. Some pyrite cement; no shows.
	30	SILTSTONE: as above.
2525-2530m	70	SANDSTONE: as above, no shows.
	30	SILTSTONE: as above.
2530-2535m	80	SANDSTONE: as above, no shows.
	20	SILTSTONE: as above.
	Trace	COAL.
2535-2540m	90	SANDSTONE: as above, no shows.
	10	SILTSTONE: as above.
2540-2545m	60	SANDSTONE: as above, no shows.
	40	SILTSTONE: as above.
2545-2550m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2550-2555m	50	SANDSTONE: as above, no shows.
	50	SILTSTONE: as above.
2555-2560m	60	SANDSTONE: as above, no shows.
	40	SILTSTONE: as above.
2560-2565m	60	SANDSTONE: as above, no shows.
	40	SILTSTONE: as above.
2565-2570m	60	SANDSTONE: as above, increasing amount of aggregates; no shows.
	40	SILTSTONE: as above.
	Trace	COAL:
2570-2575m	60	SANDSTONE: medium to light grey, translucent to opaque, medium to coarse grained, very coarse grit in parts, angular to subangular, poorly sorted, common fractured/splintered quartz grains, well frosted, low sphericity, common very poorly sorted quartz/mica, clay aggregates, variously cemented (silica and dolomite), loose silica cemented composite quartz grains, fair visual porosity grading to very poor; no shows. Trace very dull orange mineral (dolomite) fluorescence.
	40	SILTSTONE: medium dark grey to medium grey, subblocky to rounded cuttings, quartzose, micromicaceous, carbonaceous flecks, grades to fine grained silty sandstone in parts, soft to predominantly very firm to hard.
	Trace	Weathered igneous fragments, chert.

2575-2580m	70	SANDSTONE: opaque to translucent, subangular to subrounded, common silica cement, trace dolomite, rare pyrite cement, fair visual porosity, grading to poor; no shows; trace mineral fluorescence.
	30	SILTSTONE: as above.
2580-2585m	60	SANDSTONE: as above.
	40	SILTSTONE: as above.
	Trace	Chert, pyrite. (Cohesive medium dark grey clay washing from samples).
2585-2590m	60	SANDSTONE: as above.
	40	SILTSTONE: as above.
	Trace	Chert, igneous fragments, pyrite.
2590-2595m	60	SANDSTONE: clear to translucent, quartzose, medium to coarse grained occasionally granular, common fine to medium grained, poorly sorted, silica/dolomite hard cemented aggregates, subangular, poorly sorted, common silica cement, loose grains, fair visual porosity reducing to nil in cemented aggregates; no shows; trace dull orange (mineral fluorescence to medium light grey), carbonaceous, argillaceous, siliceous, grading to very fine grained silty sandstone, subrounded cuttings, hard to firm, occasionally brittle (silica cement?).
	Trace	COAL: igneous fragments, pyrite, chert (medium dark grey, microcrystalline, smoky, very hard, brittle).
2595-2601m (T.D.)	60	SANDSTONE: as above, common silica cement; no shows.
	40	SILTSTONE: as above, soft/sticky in parts, hrd to very hard in parts (silicified).
	Trace	COAL: igneous fragments. 5% bright blue-white, pale yellow mineral fluorescence, due to soft amber coloured mineral.

Appendix 2

Core No. 1

Well : KIPPER-2

Interval Cored : 2216.0-2222.0m
Cut : 6
Bit Type : CD 502
Described by : Judy Garstone/
Rob Neumann

Recovered : 5.74m (96%)
Bit Size : 12-1/4"
Date : 26th March, 1987

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
	20 0		
2217			2216.0 SANDSTONE - Fine to coarse grained, poorly sorted, sub-angular to sub-rounded, moderately strong silica content, carbonaceous, slightly micaceous, strong odour and taste. No fluorescence no stream cut, no crush cut, very poor visible porosity.
2218			2217.52 SANDSTONE - White to light grey, medium to coarse grained, sub-angular to sub-rounded, moderately well sorted, slightly carbonaceous, minor sucrosic silica cement, minor lithic fragments, good visual porosity (20%) trace cubic crystalline pyrite, no fluorescence, no stream cut, very slow yellow/white crush cut, leaving yellow/white fluorescent residue, faint odour.
2219			2219.05 SANDSTONE - Medium to coarse grained trace light grey siltstone lithics, trace pyrite and silica cement, trace kaolinite, sub-angular to sub-rounded, fair visual porosity. No fluorescence, no stream cut, very slow yellow/white crush cut. Good odour.
2220			2220.56 CONGLOMERATIC SANDSTONE - medium to pebble size, sub-angular to sub-rounded, very poorly sorted, minor kaolinite, trace silica and pyrite cement, trace lithic fragments, trace calcite cement. Poor to fair visual porosity, no fluorescence very slow dull yellow/white stream cut, very slow moderately bright yellow/white crush cut. Good odour.
2221			2221.2m CONGLOMERATIC SANDSTONE - medium grained to pebble size, angular to sub-rounded, very poorly sorted, pebbles of siltstone, strong crystalline silica cement, trace pyrite and kaolinite, no visual porosity. No fluorescence, slow moderately bright yellow/white stream cut, slow yellow/white crush cut.
2222			2221.74m SILTSTONE - quartzose, sandy, trace pyrite, trace carbonaceous, hard, slightly dolomitic. No fluorescence, no cut.

Handwritten notes:
2217
2218
2219
2220
2221
2222

Handwritten notes:
2217
2218
2219
2220
2221
2222
shaly
17/3/87

Core No. 2

Well

: KIPPER-2

Interval Cored : 2222.0-2231.0

Cut : 9m

Bit Type : CB-303

Described by : Judy Garstone/
Rob Neumann

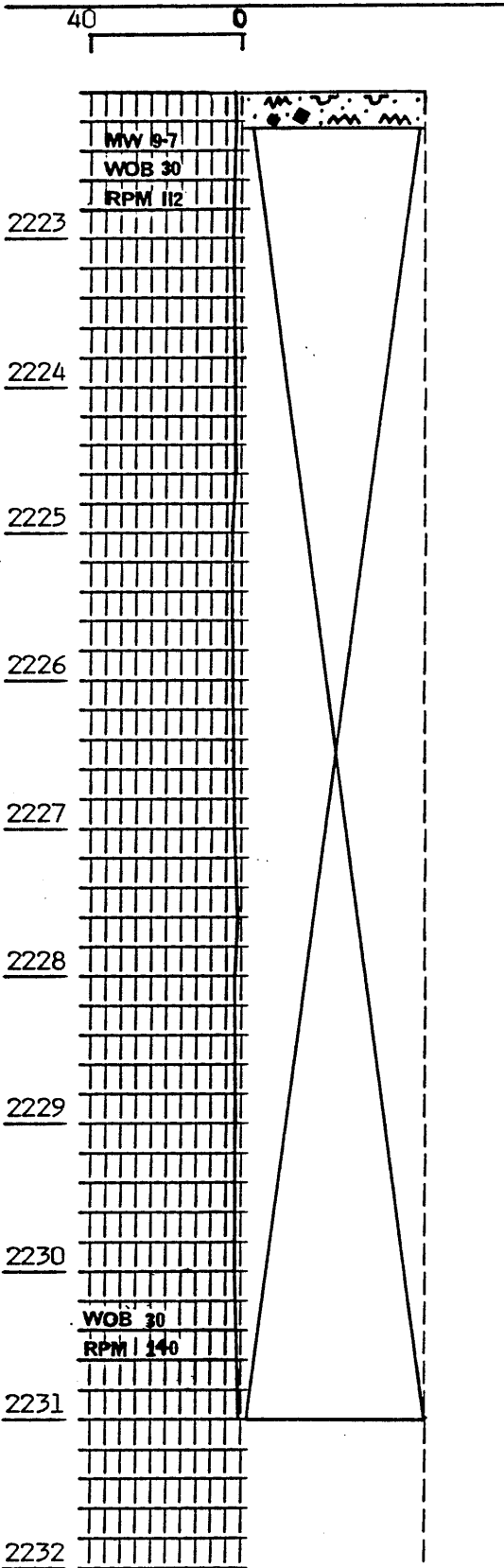
Recovered : 0.25m (2.8%)

Bit Size : 12-1/4"

Date : 27/3/87

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



2222.0-2222.25m (0.25m) SILTSTONE - sandy grading to very fine grained sandstone, light to medium dark grey, common fine to medium grained well rounded quartz grains set in siltstone matrix. Common pyrite - banded pyrite bed in basal 1cm of core - Common pyrite/marcasite nodules (0.5 to 1cm dia) throughout core. Wavy discontinuous bedding, common burrows (clay lined, siltstone to very fine grained sandstone filled, 1cm x 3cm) in top 6cm of core, some with pyrite/marcasite nodules in centre of burrow. No fluorescence, no shows, no visual porosity.

NOTE: Base of fibreglass sleeve worn and a 1m section broken off and "telescoped" back into itself. ROP's not necessarily representative of lithologies.

Core No. 3

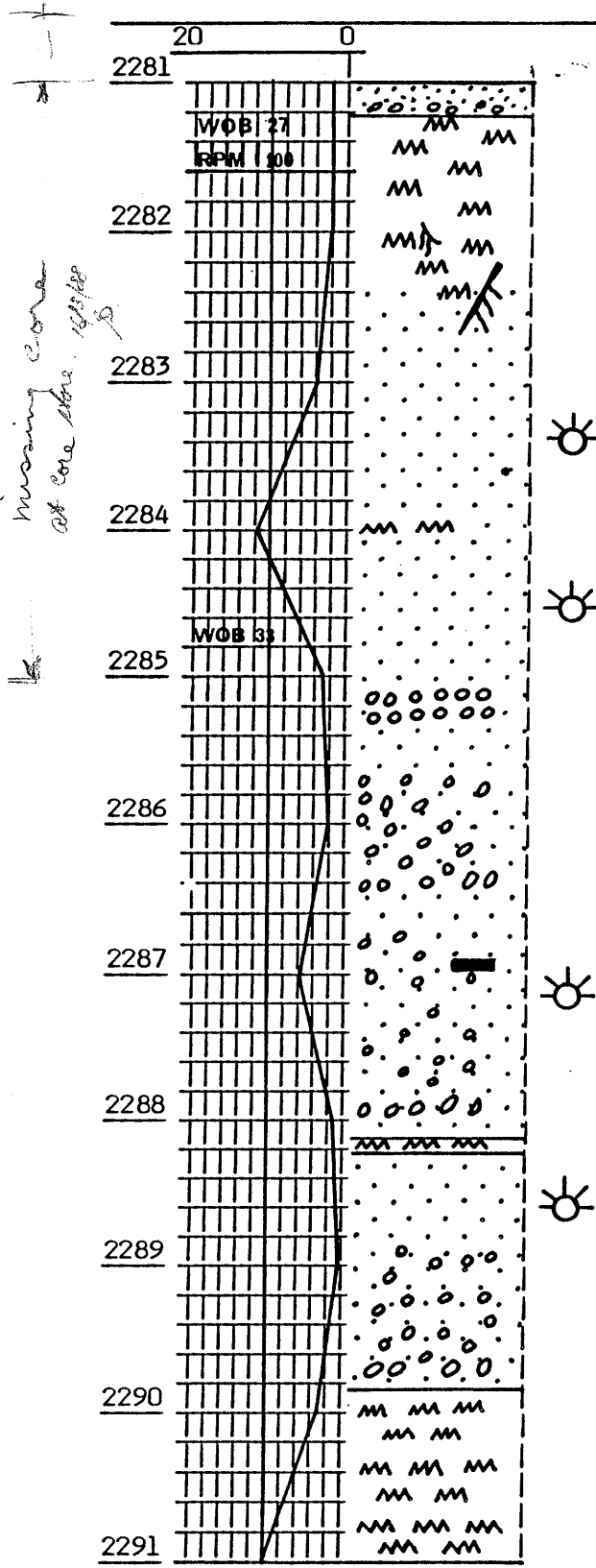
Well : KIPPER-2

Interval Cored : 2281.0-2294.3m
Cut : 13.3m
Bit Type : CB-303
Described by : Rob Neumann/
Judy Garstone

Recovered : 12m (90.2%)
Bit Size : 12-1/4"
Date : 29th March 1987

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

Descriptive Lithology



2281-2281.11m SANDSTONE - Medium grain to pebble size, very poorly sorted, common carbonaceous laminae, conglomeratic erosional base into underlying siltstone. No fluorescence, no stream cut, very slow dull yellow crush cut, faint gas odour.

2281.11-2282.41m SILTSTONE - Medium to dark grey, becoming sandy towards the base, common rootlets and root fragments in basal 40cm, one 4cm root penetrating 45cm into underlying sandstone.

2282.41-2283.9m SANDSTONE - fine to medium grained, angular to sub-rounded, moderately well sorted, weak silica cement and minor kaolinite, poor to fair visual porosity, No fluorescence, no stream cut, very slow dull yellow crush cut, faint gas odour.

2283.9m-2288.12m SANDSTONE - medium to coarse grained, grading to pebbly conglomerate between 2285.1 and 2285.23m, 2285.64-2286.5m and 2286.58-2288.12m, predominantly quartzite and siltstone pebbles, well rounded up to 3cm across. Large woody fragment (2cm x 12cm) at 2287.05m, overlying a 1cm siltstone bed. Sandstone is angular to sub-rounded, poorly sorted with minor lithic fragments, weak to moderately strongly silica cemented, poor to fair visual porosity. No fluorescence, no stream cut, very slow dull yellow crush cut, fair gas odour.

2288.12-2288.20m SILTSTONE - medium to dark grey.

2288.2-2289.85m SANDSTONE - medium to coarse grained, grading to pebbly conglomerate towards base, very sharp erosional base. Sandstone sub-angular to sub-rounded, poorly sorted with minor lithic fragments. Weak sucrosic silica cement, fair to good visual porosity and permeability. 1cm thick carbonaceous siltstone at 2289.5m.

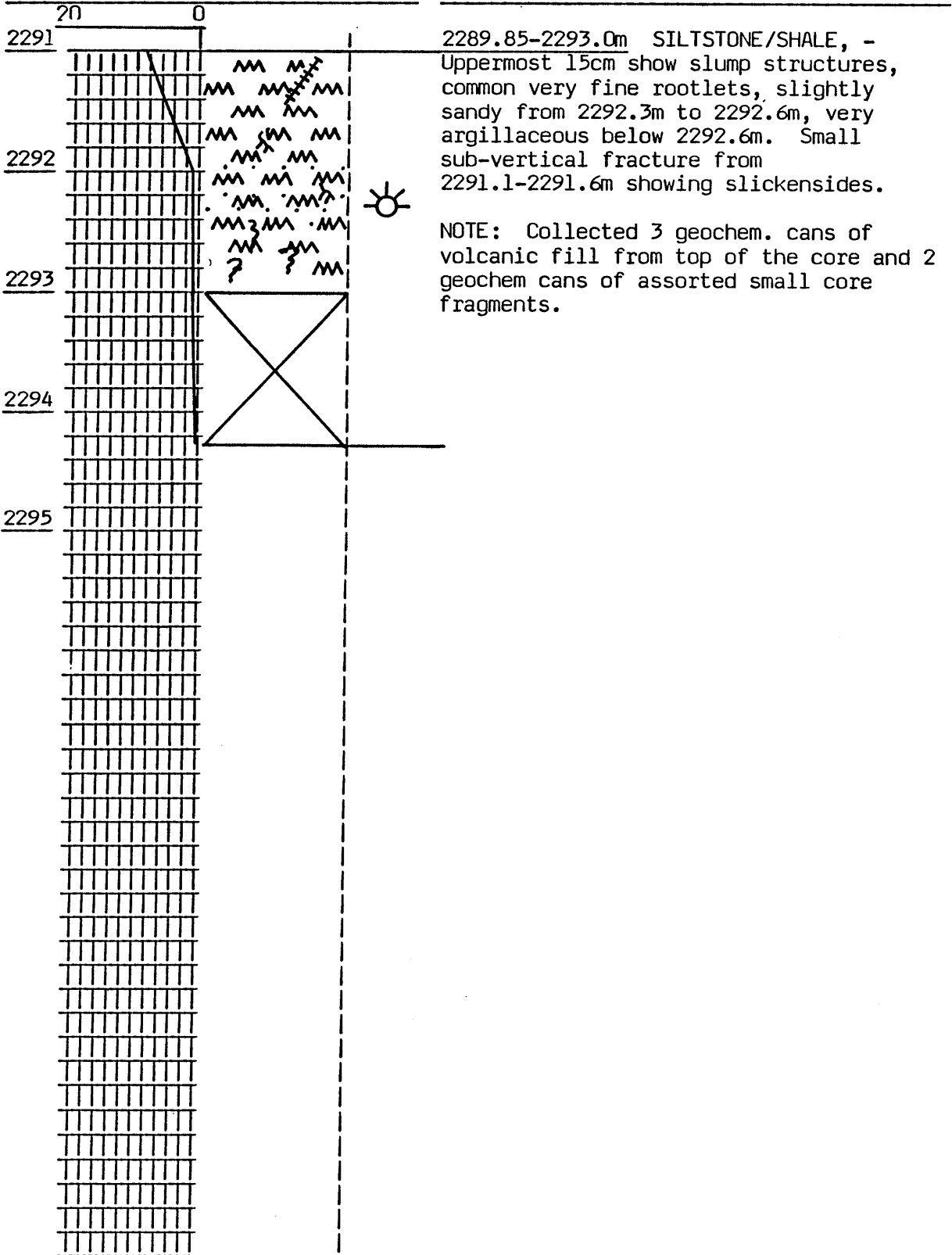
Core No. 3

Well : KIPPER-2

Interval Cored : 2281.0-2294.3m
Cut : 13.3m
Bit Type : CB-303
Described by : Rob Neumann/
Judy Garstone

Recovered : 12m (90.2%)
Bit Size : 12-1/4"
Date : 29th March 1987

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



Core No. 4

Well : KIPPER-2

Interval Cored : 2294.3-2311.5m

Cut : 17.2m

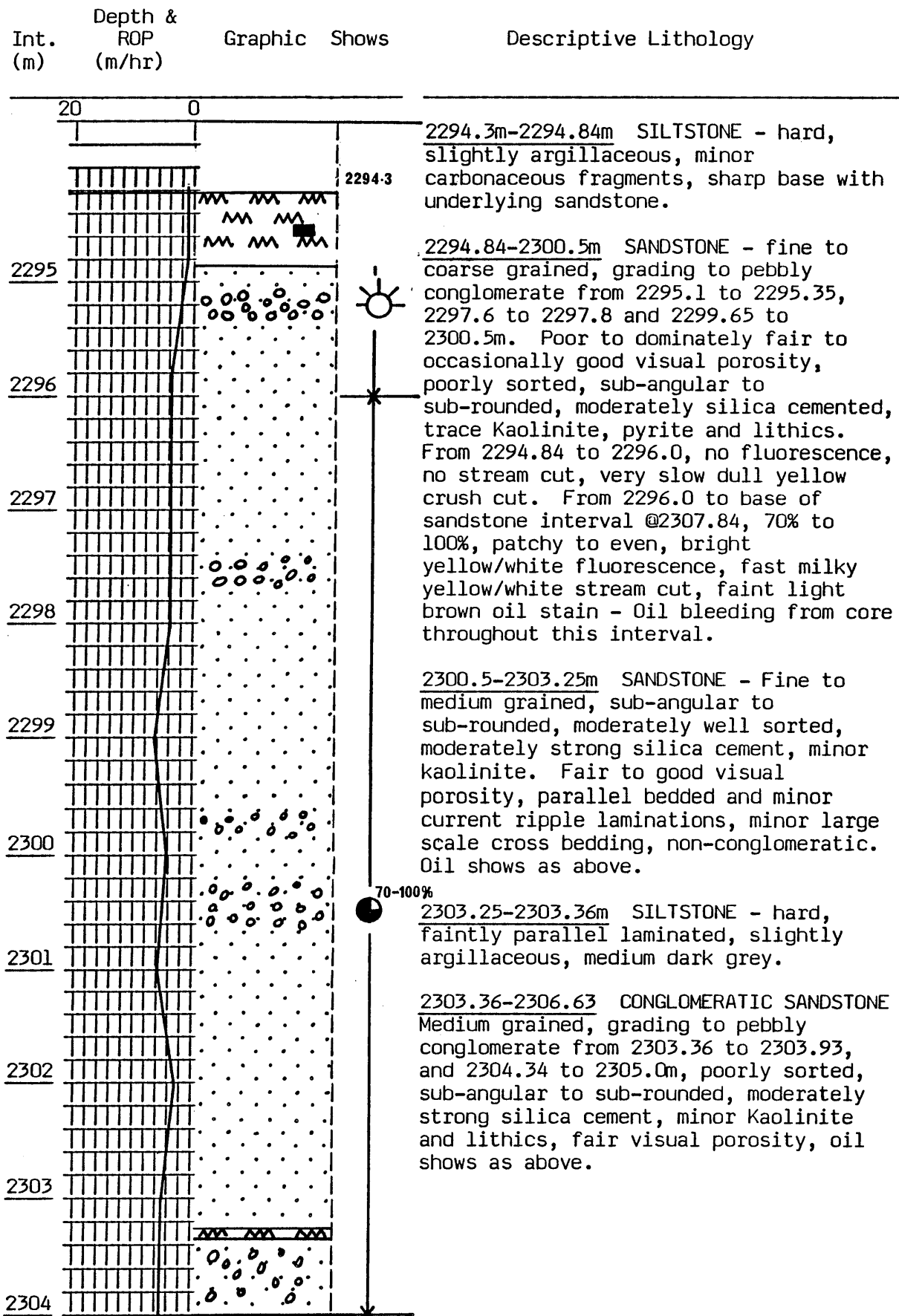
Bit Type : CB-303

Described by : Rob Neumann/
Judy Garstone

Recovered : 16.22 (94.3%)

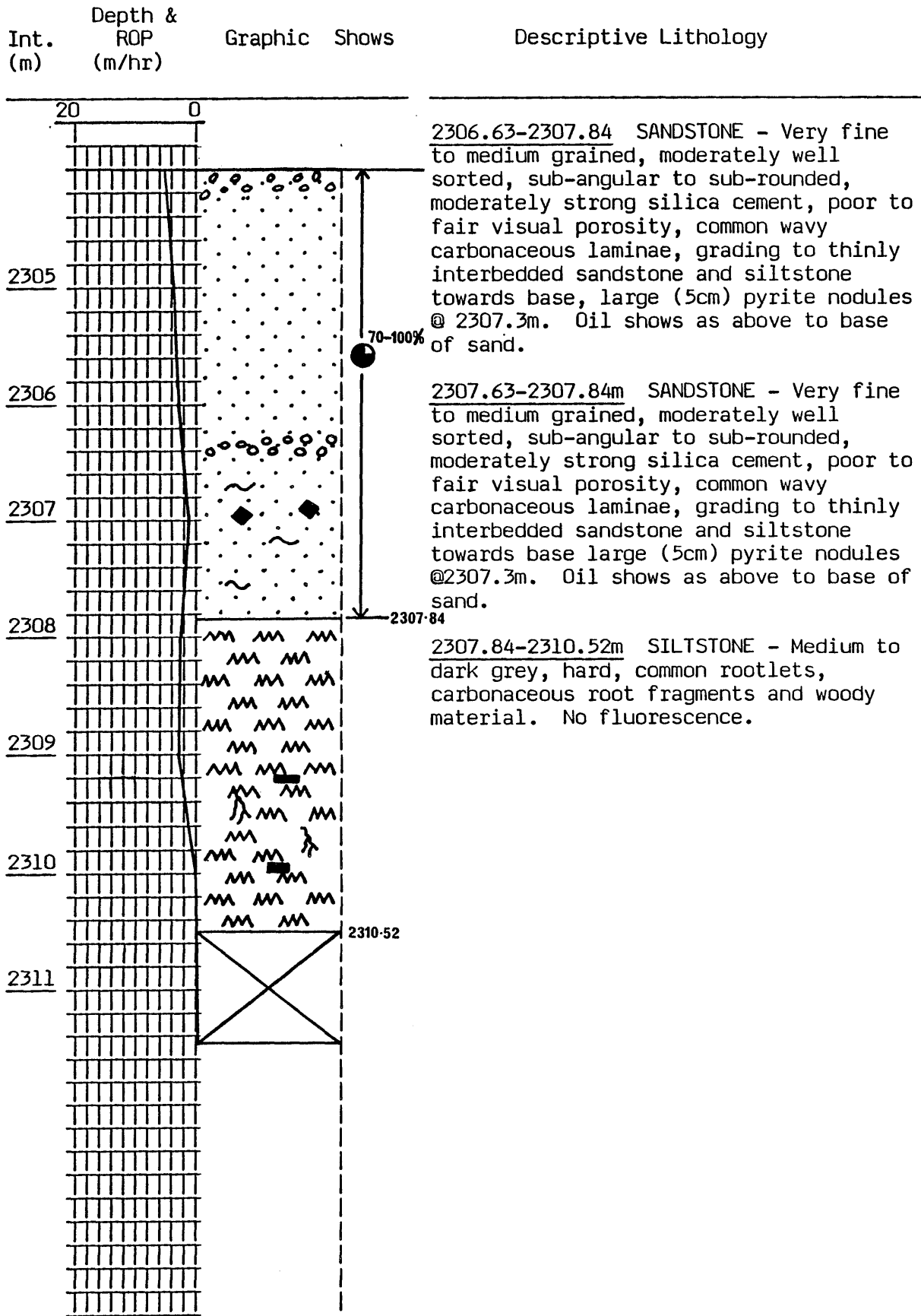
Bit Size : 12 1/4"

Date : 31st March, 1987



Core No. 4
 Interval Cored : 2294.3-2311.5m
 Cut : 17.2m
 Bit Type : CB-303
 Described by : Rob Neumann/
 Judy Garstone

Well : KIPPER-2
 Recovered : 16.22m (94.3%)
 Bit Size : 12 1/4"
 Date : 31 March, 1987

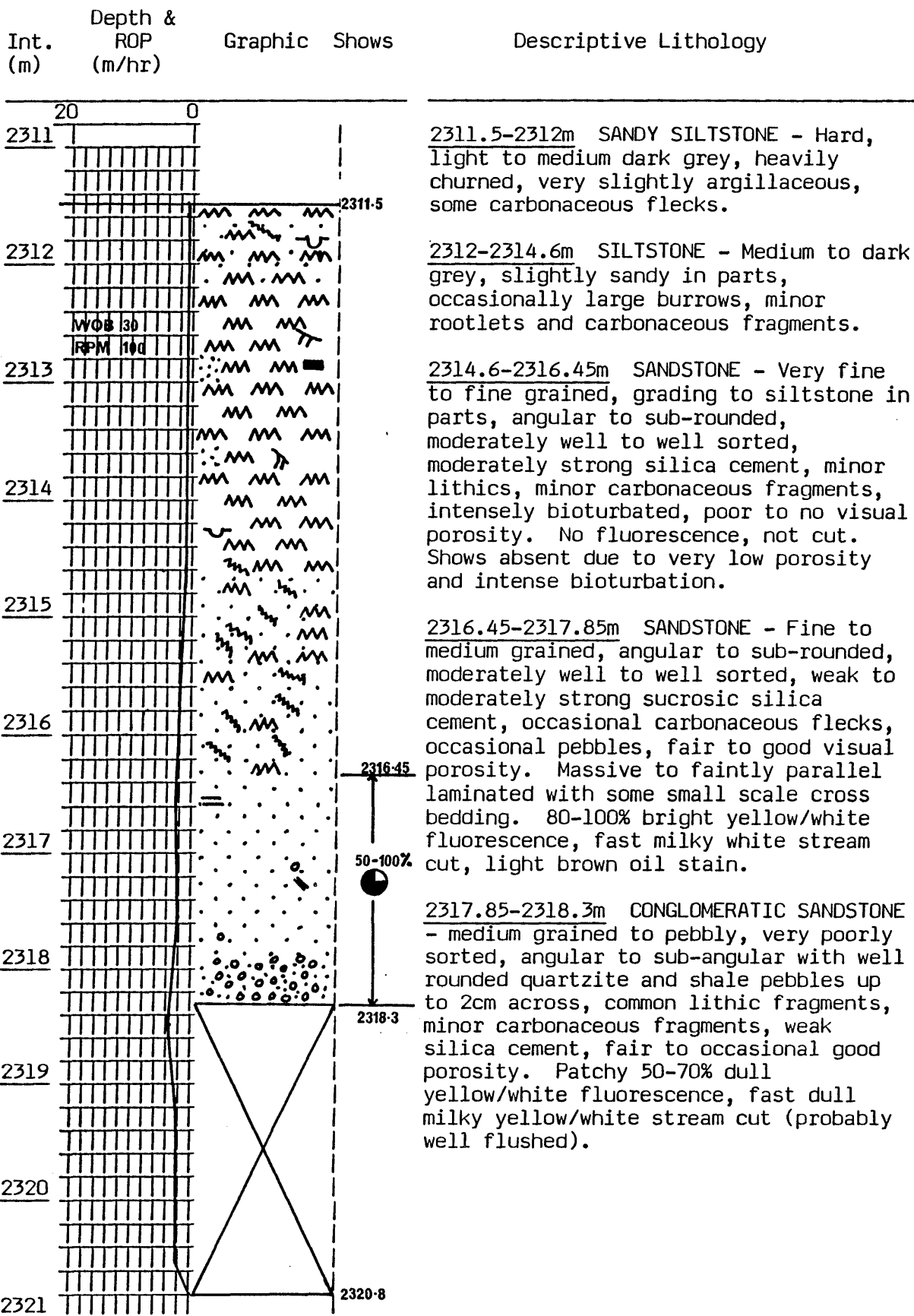


Core No. 5

Well : KIPPER-2

Interval Cored : 2311.5-2320.8m
Cut : 9.3m
Bit Type : CB-303
Described by : Judy Garstone/
Rob Neumann

Recovered : 6.8m (73.1%)
Bit Size : 12 1/4"
Date : 1st April 1987

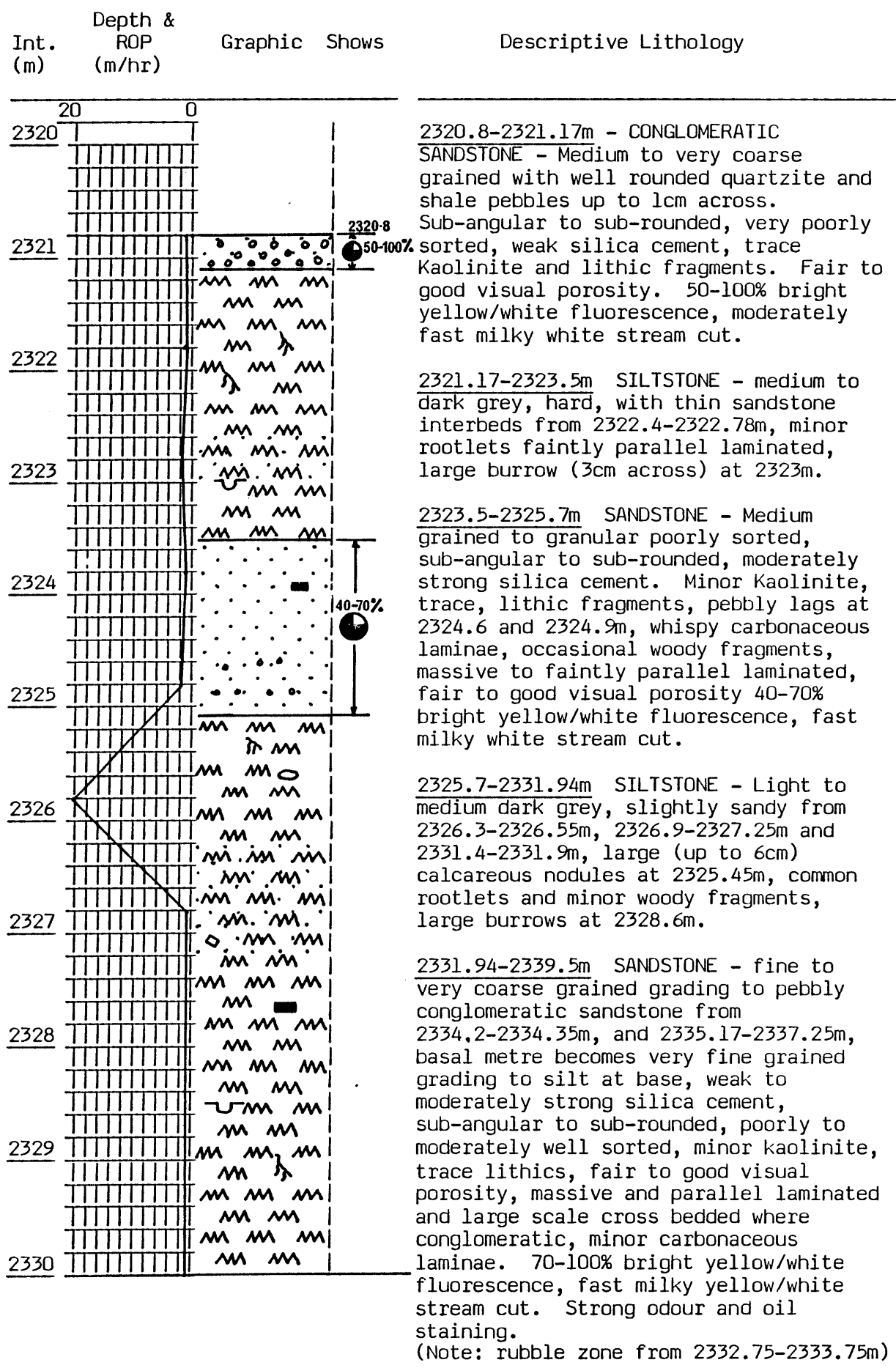


Core No. 6

Well : KIPPER-2

Interval Cored : 2320.8-2338.8m
Cut : 18m
Bit Type : 12 1/4"
Described by : Judy Garstone/
Rob Neumann

Recovered : 18.70m (104%)
Bit Size : 12 1/4"
Date : 2nd April 1987



Core No. 6

Well : KIPPER-2

Interval Cored : 2320.8-2338.8m

Cut : 18m

Recovered : 18.70m (104%)

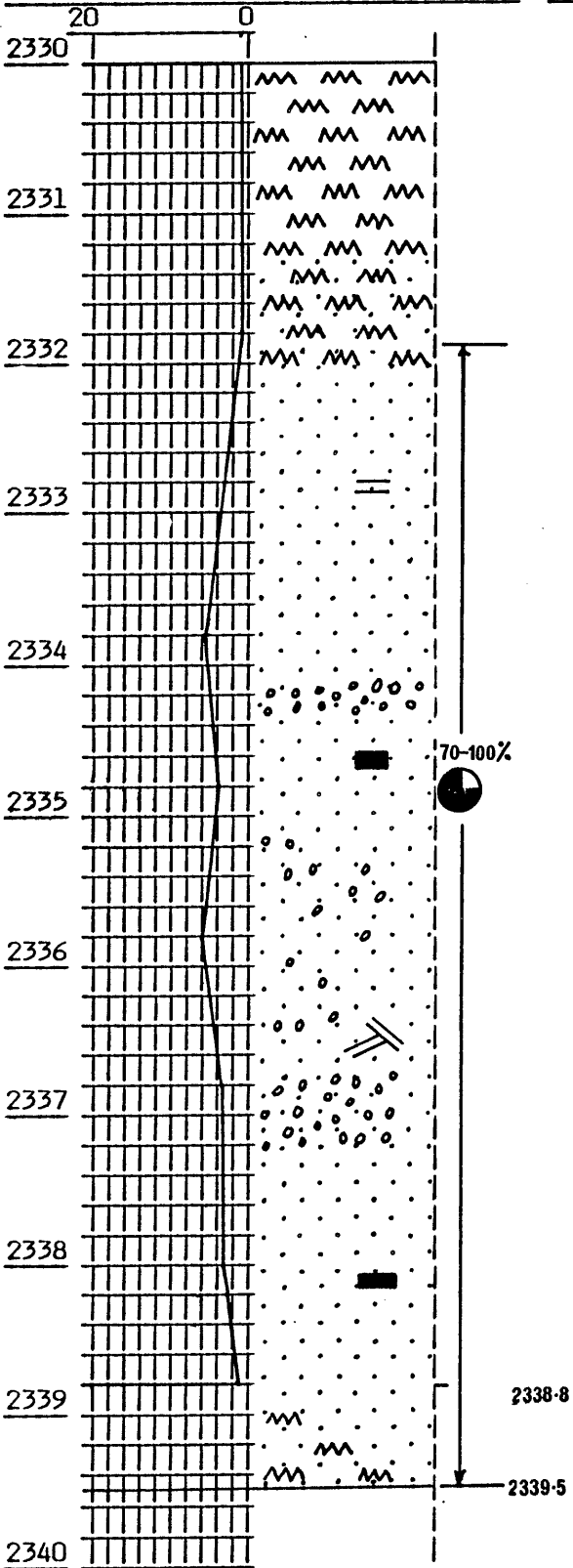
Bit Type : 12 1/4"

Bit Size : 12 1/4"

Described by : Judy Garstone/
Rob Neumann

Date : 2nd April 1987

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



Core No. 7

Well : KIPPER-2

Interval Cored : 2338.8-2346.7m

Cut : 7.9m

Bit Type : 12 1/4"

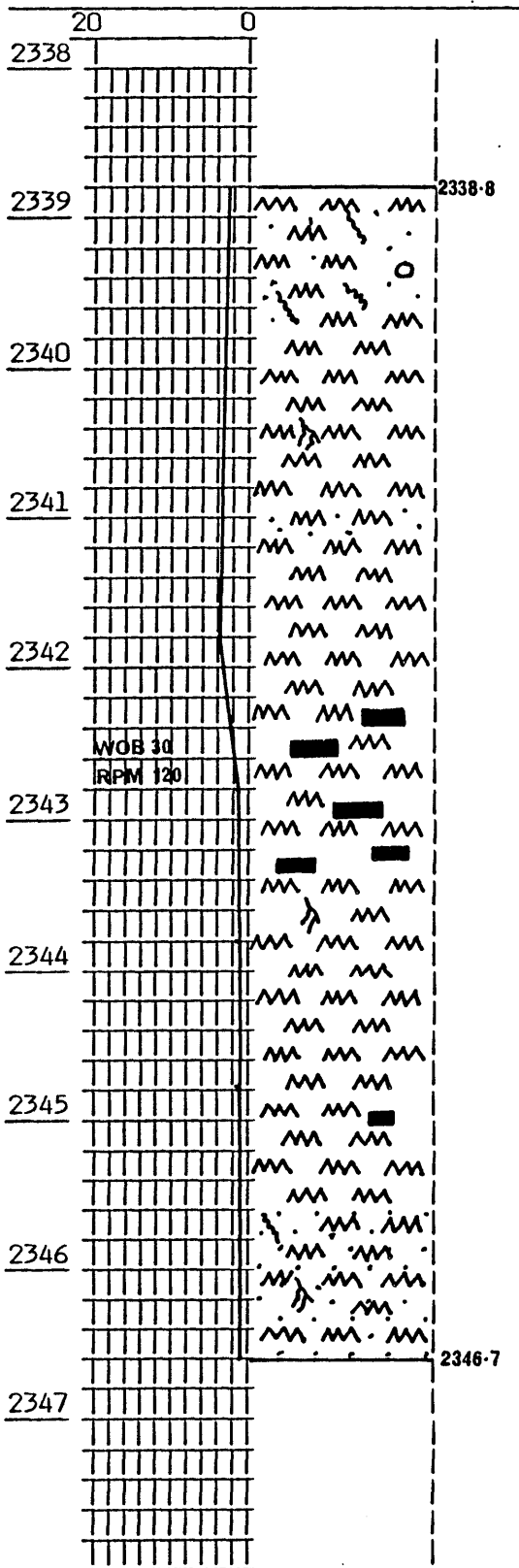
Described by : Judy Garstone/
Rob Neumann

Recovered : 7.83m (99.1%)

Bit Size : 12 1/4"

Date : 3rd April 1987

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
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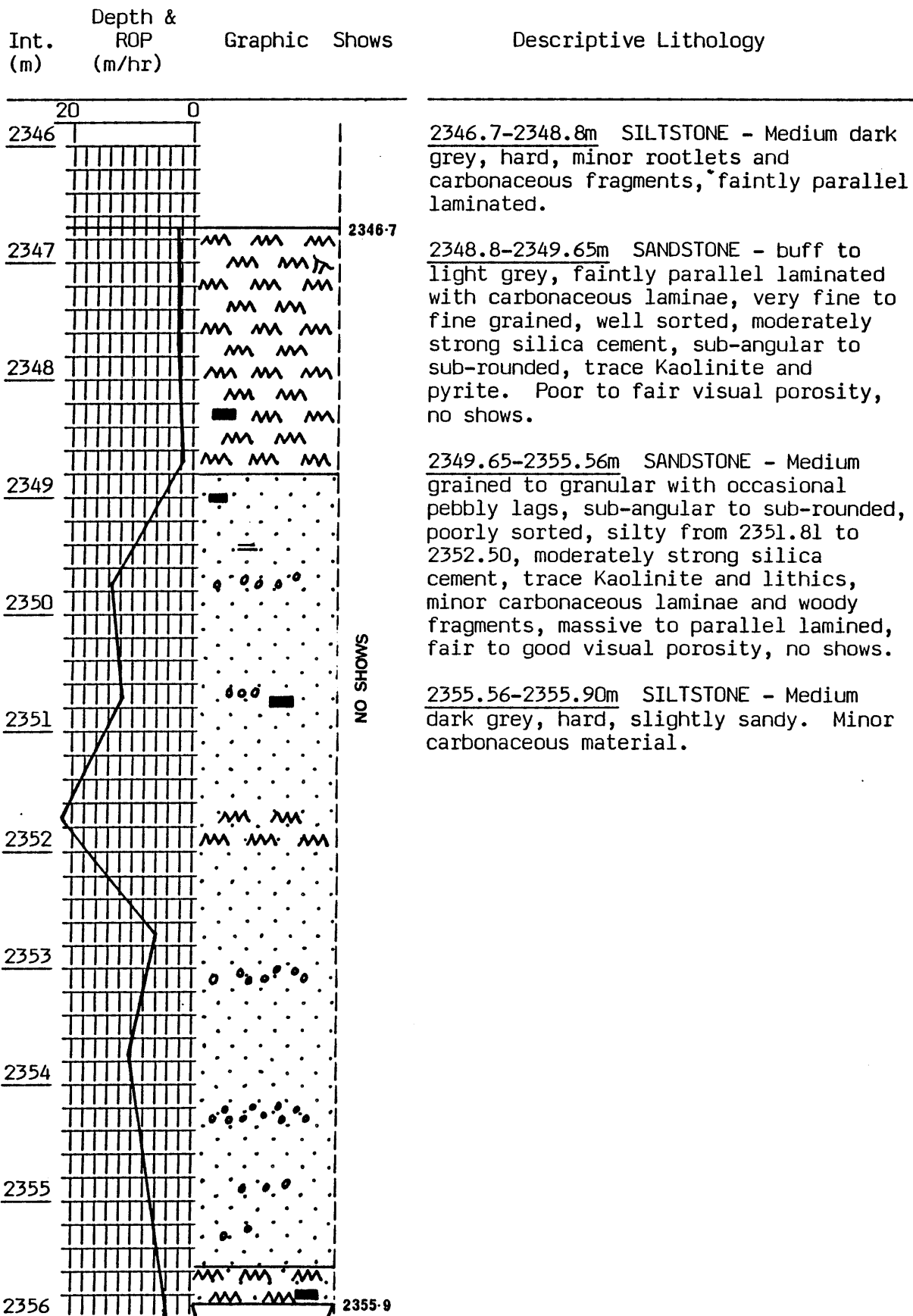
2338.8-2346.63m SILTSTONE - hard, light to medium dark grey. Slightly sandy from 2338.8 to 2339.7, 2341.0 to 2341.15m, and 2345.7 to 2346.15. Extremely carbonaceous, grading to silty coal from 2342.3 to 2343.4 with pungent organic odour. Minor rootlets, abundant carbonaceous material and woody fragments, sandy intervals bioturbated. Pyrite nodules in top 15cm of core. Faintly parallel laminated. Sandy siltstones have no visual porosity, no shows.

Core No. 8

Well : KIPPER-2

Interval Cored : 2346.7-2360.1m
Cut : 13.4m
Bit Type : CB-303
Described by : Rob Neumann/
Judy Garstone

Recovered : 9.2m (69%)
Bit Size : 12 1/4"
Date : April 3 1987



Core No. 8

Well : KIPPER-2

Interval Cored : 2346.7-2360.1m

Cut : 13.4m

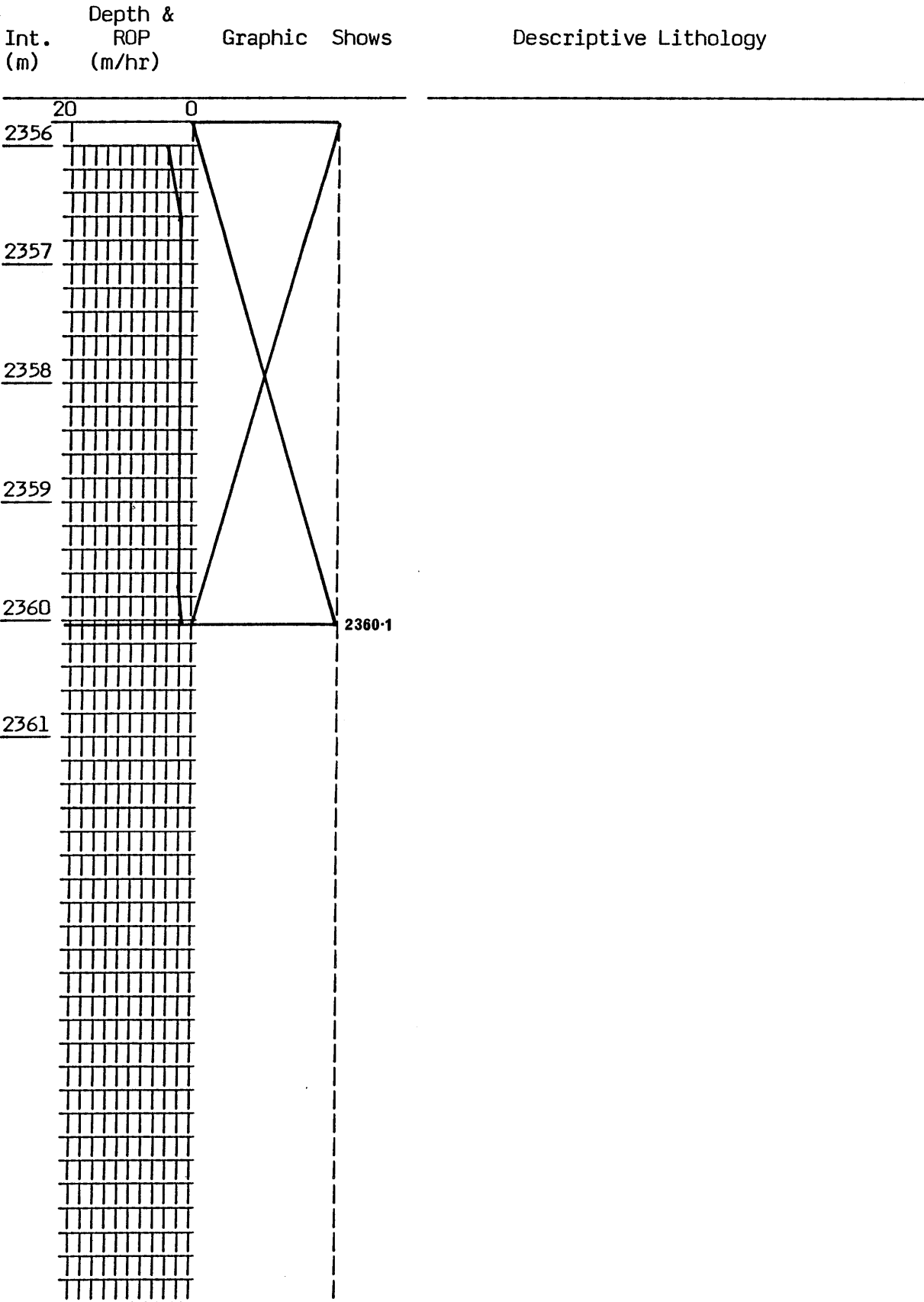
Recovered : 9.2m (69%)

Bit Type : CB-303

Bit Size : 12 1/4"

Described by : Rob Neumann/
Judy Garstone

Date : April 3 1987



Core No. 9

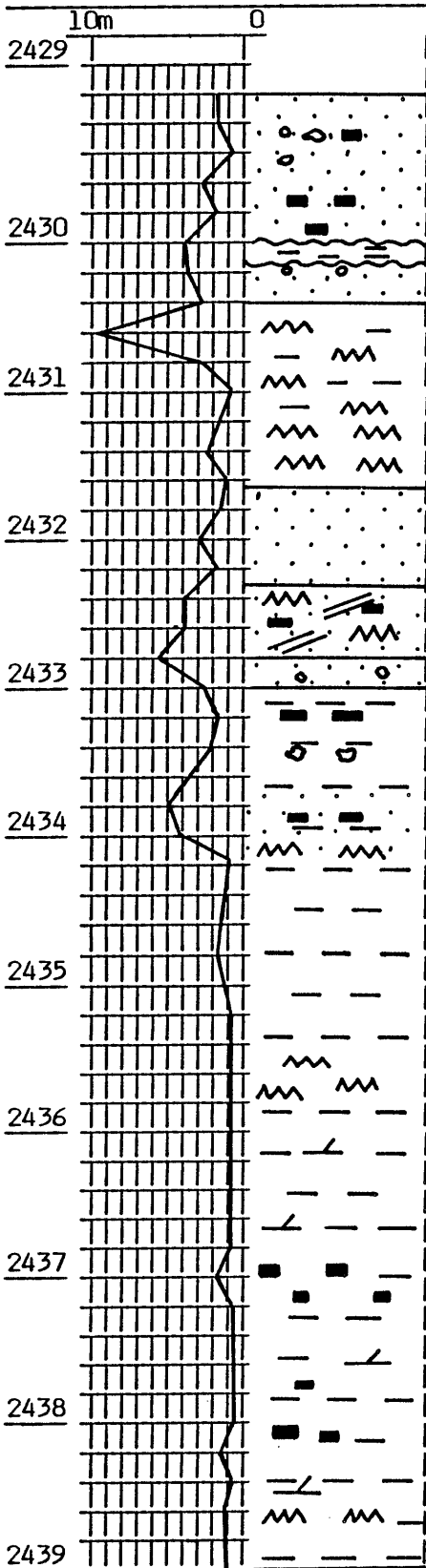
Well : KIPPER-2

Interval Cored : 2429.2-2439.0m
Cut : 9.8m
Bit Type : CB 303
Described by : L. Finlayson
J. Hendrik

Recovered : 9.8m (100%)
Bit Size : 12 1/4"
Date : 13th April, 1987

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

Descriptive Lithology



2429.2-2430.41m: SANDSTONE: quartz, medium-coarse grained, translucent, poorly sorted, subrounded, consolidated, white clay matrix clogging pore spaces, carbonaceous inclusions, scour base at 2430.0m with coarse grit above and below a 10cm siltstone bed @ 2430.0-2430.1m. Poor-fair visual porosity - improving towards base - No shows.

2430.41-2431.66m: SILTSTONE: medium grey, quartzose, micaceous, carbonaceous laminae inclusions, grading to very fine grained sand, firm-hard, non calcareous

2431.66m-2432.36: SANDSTONE: translucent to clear, medium grained, becoming fine grained towards base, quartzose, subrounded, well sorted, consolidated occasional carbonaceous inclusions, abundant white clay matrix (Kaolinite?) reducing porosity. Poor visual porosity. - No shows.

2432.36-2433.0m: SILTY SANDSTONE: Very fine to fine grained, quartzose, opaque, very well frosted, subrounded, moderately well sorted, sucrosic texture, consolidated, common silica cement, kaolinite/white mica matrix reducing porosity. Carbonaceous inclusions/laminae define flaser/cross-bedding. Decreasing carbonaceous material towards base, very poor visual porosity, grading to poor-fair at base. No shows

2433.0m-2434.4m. SANDY SILTSTONE: medium grey, quartzose, micaceous, argillaceous, blocky-nonfissile, abundant carbonaceous material including plant remains, grades to silty sandstone at base, interbedded with cleaner fine grained sandstone poor visual porosity, no shows.

2434.22-2439.0m: DOLOMITIC SHALE: medium grey-brown grey, blocky, sucrosic texture, cryptocrystalline dolomite (destructive), original texture largely obliterated. Occasional coal/carbonaceous laminae/inclusions preserving relict texture.

Appendix 3

KIPPER-2

SIDEWALL CORE DESCRIPTIONS

<u>No.</u>	<u>Depth</u>	<u>Rec.</u> (mm)	<u>Rock</u> <u>Type</u>	<u>Description</u>
1	2590.1	10	SILTSTONE	Dark grey, soft, very slightly calcareous, quartzose.
2	2580.1	25	SILTSTONE	Grey, firm, quartzose, micaceous, carbonaceous.
3	2564.0	15	SILTSTONE	Grey, soft, quartzose, micaceous, sandy.
4	2544.1	15	SILTSTONE	Dark grey, quartzose.
5	2528.5	15	SILTSTONE	Dark grey, soft, slightly calcareous, quartzose, glauconitic, micaceous.
6	2517.0	15	SILTSTONE	Grey, firm, slightly calcareous, quartzose, micaceous.
7	2503.5	15	SILTSTONE	Grey, firm, slightly calcareous, quartzose, micaceous.
8	2491.0	15	SILTSTONE	Dark grey, firm, slightly calcareous, quartzose, micaceous, sandy.
9	2475.0	20	SILTSTONE	Dark grey, firm, quartzose, micaceous.
10	2461.0	15	SILTSTONE	Dark grey, firm, quartzose, micaceous.
11	2444.0	20	SILTSTONE	Dark grey, firm, quartzose, micaceous.
12	2413.5	20	SILTSTONE	Grey, hard, slightly calcareous, quartzose, micaceous, sandy; well cemented sandstone aggregates in a silty matrix.
13	2403.6	20	SANDSTONE	Light grey, very fine grained, well sorted, well rounded, soft, quartzose, clay, carbonaceous.
14	2385.0	20	SANDSTONE	Light grey, very fine grained, well sorted, well rounded, soft, moderately calcareous, quartzose, clay, carbonaceous.
15	2364.4	20	SILTSTONE	Grey, firm, slightly calcareous, quartzose, micaceous.
16	2267.6	20	SANDSTONE	Grey to white, fine grained, well sorted, well rounded, soft, slightly calcareous, quartzose, clay.
17	2260.0	30	VOLCANICS	Light to dark green, white, fine to very fine grained, friable, very slightly calcareous, calcite, green crystals/grains.

18	2246.5	20	VOLCANICS	Green, white, fine grained, friable, very slightly calcareous, calcite, green crystals; altered volcanics.
19	2242.1	15	CLAYSTONE	Medium grey, soft, silty, carbonaceous.
20	2235.6	15	CLAYSTONE	Medium grey, soft, silty, carbonaceous.
21	2211.6	15	SANDSTONE	Grey, very fine grained, poorly sorted, subangular, firm, quartzose; gas smell, trace Cl.
22	2200.1	30	VOLCANICS	Dark green grey, very fine grained, firm, moderately calcareous, chloritic; altered volcanics.
23	2115.0	15	VOLCANICS	Dark green grey, very fine grained, firm, moderately calcareous, chloritic; altered volcanics.
24	2075.1	40	VOLCANICS	Grey white, medium grained, subrounded, firm, slightly calcareous; reworked volcanic?
25	2055.1	10	SILTSTONE	Grey, firm, quartzose, micaceous, sandy.
26	2041.5	20	SILTSTONE	Grey, firm, very slightly calcareous, quartzose, micaceous, sandy, carbonaceous.
27	2030.0	20	SILTSTONE	Brown grey, firm, quartzose, carbonaceous, micaceous.
28	2015.5	20	SANDSTONE	Light grey, fine grained, well sorted, well rounded, soft, quartzose, silty, carbonaceous.
29	1999.0	15	SILTSTONE	Brown grey, fine grained, well sorted, well rounded, soft, quartzose, sandy, micaceous.
30	1982.5	25	SILTSTONE	Light grey to black, very fine grained, well sorted, well rounded, soft, slightly calcareous, quartzose, very sandy, very carbonaceous, micaceous.
31	1969.0	25	SILTSTONE	Grey, firm, quartzose, micaceous.
32	1954.0	30	SANDSTONE	Light grey to black, fine grained, well sorted, well rounded, soft, carbonaceous, silty, micaceous.
33	1944.0	45	SHALE	Dark grey to brown, hard, slightly calcareous, sandy, silty, carbonaceous, micaceous.
34	1929.5	20	SANDSTONE	Light grey to white, fine grained, well sorted, well rounded, soft, clayey.
35	1899.5	15	SILTSTONE	Light grey to white, soft, slightly calcareous, sandy, clay.
36	1888.0	15	SILTSTONE	Light grey to white, soft, slightly calcareous, sandy, clay.

37	1880.6	20	SILTSTONE	Light grey to white, soft, sandy, carbonaceous, micaceous.
38	1871.5	40	SILTSTONE	Grey to brown, firm, sandy, micaceous, glauconitic?
39	1809.5	35	SILTSTONE	Grey to brown, soft, sandy, micaceous.
40	1787.0	35	SANDSTONE	White, very fine grained, well sorted, well rounded, soft, quartzose, clay, very carbonaceous.
41	1754.0	30	SILTSTONE	Light grey, soft, moderately calcareous, quartzose, carbonaceous, sandy.
42	1742.5	25	SILTSTONE	Brown to grey, firm, quartzose, micaceous.
43	1723.5	30	SILTSTONE	Light grey, soft, quartzose, micaceous.
44	1699.5	45	SILTSTONE	Dark brown, hard, quartzose, micaceous, carbonaceous.
45	1686.0		MISFIRED	
46	1675.5	40	SILTSTONE	Dark brown, hard, slightly calcareous, quartzose, micaceous.
47	1652.5	35	SHALE	Grey, hard, quartzose, micaceous.
48	1623.5	25	SILTSTONE	Grey, firm, occasionally large quartzose grains, micaceous.
49	1603.0	45	SILTSTONE	Light grey, firm, slightly calcareous, quartzose, carbonaceous, micaceous.
50	1591.4	40	SILTSTONE	Light grey, firm, quartzose, sandy.
51	1585.5	35	SANDSTONE	Light grey, very fine grained, well sorted, well rounded, soft, quartzose.
52	1577.0	35	SILTSTONE	Brown to grey, soft, slightly calcareous, quartzose, sandy, micaceous.
53	1565.0	35	SANDSTONE	Grey, fine grained, well sorted, well rounded, soft, moderately calcareous, quartzose, micaceous.
54	1559.9		EMPTY	
55	1555.1	30	SILTSTONE	Grey to brown, fine grained, well sorted, well rounded, soft, moderately calcareous, quartzose, sandy, micaceous.
56	1550.1	40	SILTSTONE	Grey to brown, soft, moderately calcareous, quartzose, micaceous, sandy.
57	1544.0	35	SILTSTONE	Brown, silty to very coarse, poorly sorted, well rounded, moderately calcareous, occasionally very coarse, well rounded quartzose grains, glauconite grains common.

58	1538.1	45	SILTSTONE	Brown, soft, very calcareous, quartzose, glauconite grains common. *
59	1531.0	35	SILTSTONE	Grey, firm, very calcareous, quartzose, glauconite grains. *
60	1523.9	45	SHALE	Grey, very hard, very calcareous, quartzose.

Appendix 4

RFT PRESSURE DATA

Page 1 of 4

WELL: KIPPER #2

GEOLOGIST/ENGINEER: IAN D. PALMER/J. HENDRICH

DATE: 9/4/87

RFT No. Run/Seat	Depth		Initial Hydrostatic		Time Set	Minimum Flowing Pressure psia (Pretest)	Formation Pressure		Temp °F	Time Retract	Final Hydrostatic		Comments (Include Probe type) L = Long nose probe
	m MDKB	m TVDSS KB=22	HP	/ RFT gauge psia / psig			HP	/ RFT gauge psia / psig			ppg	ppg	
I-1 PT	2358.5	2336.5	3905.3	/3887.4	21:34		3405.77	/3395	181.5	21:50	3904.2	/3887*	RFT GAUGE SUSPECT - CALIB. 9.66 PROBE? GOOD PERM - GOOD TEST. WATER
I-2 PT	2353.8	2331.8	3897.7	/3882.7	21:58	3379.1	3398.88	/3388.9	8.51	22:07	3896.6	/3882.3	GOOD PERM - GOOD TEST. 9.67 WATER
I-3 PT	2339.3	2317.3	3869.5	/3860	22:16	3359.9	3377.90	/3366.5	8.51	22:43	3873.9	/3859*	GOOD PERM - GOOD TEST 9.67 SLOW STABILIZATION. WATER
I-4 PT	2334.0	2312.0	3864.2	/3851.3	22:54	3321	3371.09	/3360	8.51	23:12	3864.9	/3850.4	GOOD PERM - GOOD TEST 9.67 WATER
I-5 PT	2325.3	2303.3	3850.6	/3835	23:19	3807.9							SEAL FAILURE
I-6 PT	2325.0	2303.0	3849.1	/3836.4	23:25	3287	3358.42	/3346.5	8.51	23:48	3850.4	/3836	FAIR PERM - GOOD TEST 9.67
I-7 PT	2321.0	2299.0	3844.5	/3830	23:52	3266	3352.72	/3340.8	8.51	24:02	3844.6	/3830.0	FAIR PERM - GOOD TEST 9.68
I-8 PT	2308	2286.0	3822.4	/3809.5	00:08	2607	3340.47	/3327.7	8.53	00:33	3823.7	/3808	TIGHTER - GOOD TEST 9.67
I-9 PT	2305.2	2283.2	3818.5	/3804.5	00:43	2600	3337.93	/3325.7	8.53	00:51	3817.9	/3803.0	GOOD TEST 9.67
I-10 PT	2301.4	2279.4	3811.6	/3798	00:57	2600	3336.65	/3323.9	8.55	01:02	3812.0	/3797.2	HIGH PRESSURE?? 9.67 SUPERCHARGED

RFT PRESSURE DATA

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WELL: KIPPER #2
DATE: 10/4/87

GEOLOGIST/ENGINEER: V.J. BINNS/L. FINLAYSON

RFT No. Run/Seat	Depth		Initial Hydrostatic		Time Set	Minimum Flowing Pressure psia (Pretest)	Formation Pressure		Temp °F	Time Retract	Final Hydrostatic		Comments (include Probe type) L = Long nose probe
	m MDKB	m TVDSS KB=22	HP / RFT gauge psia / psig	ppg			HP / RFT gauge psia / psig	ppg			HP / RFT gauge psia / psig	ppg	
I-11 PT	2298	2276	3805.71/3791.8	9.67	01:09	3315	3335.09/3323.3	8.55	183.7	01:20	3805.9/3791.2	9.67	GOOD PERM. GOOD TEST
I-12 PT	2291.3	2269.3	3794.5/3780.7	9.67	01:28	3260	3333.05/3321.50	8.57	183.2	01:45	3795.1/3780.5	9.67	GOOD PERM. GOOD TEST
I-13 PT	2287.5	2265.5	3788.2/3774.8	9.68	01:52	2553	3332.39/3320.3	8.59	183.1	02:10	3788.4/3774.6	9.68	TIGHTER. FAIR PERM FAIR TEST
I-14 PT	2281.5	2259.5	3778.5/3764.9	9.68	02:22	3312	3329.63/3320.9	8.34	184.2	02:42	3777.4/3763.9	9.67	GOOD PERM. GOOD TEST
I-15 PT	2270.5	2248.5	3759.0/3746.8	9.68	02:50	3302	3326.59/3315.6	8.64	183.6	03:07	3759.7/3746.3	9.67	FAIR - GOOD PERM GOOD TEST
I-16 PT	2234.5	2212.0	3697.5/3685.3		03:18								SEAL FAILURE
I-17 PT	2234.5	2212.5	3701.0/3687.5	9.68	03:26	3295	3317.16/3308.0	8.75	181.5	03:40	3699.8/3687.8	9.68	GOOD PERM. GOOD TEST

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RFT PRESSURE DATA

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WELL: KIPPER #2
DATE: 10/4/87

GEOLOGIST/ENGINEER: V.J. BINNS/L. FINLAYSON

RFT No. Run/Seat	Depth		Initial Hydrostatic		Time Set	Minimum Flowing Pressure psia (Pretest)	Formation Pressure		Temp °F	Time Retract	Final Hydrostatic		Comments (Include Probe type) L = Long nose probe
	m MDKB	m TVDSS KB=22	HP	/ RFT gauge psia / psig			HP	/ RFT gauge psia / psig			ppg	ppg	
I-18 PT	2219.0	2197.0	3673.0/3662.5		03:43	2971	3313.51/3302.0		181.6	04:10	3674.0/3662.0		TIGHTER FORMATION FAIR 9.68 TEST - LONGER TO STABILISE
I-19 PT	2214.5	2192.5	3667.7/3654.3		04:22	2773	3312.87/3300.8		181.2	04:27	3667.7/3654.1		VERY GOOD TEST. QUICK 9.67 TO STABILIZE. GOOD PERM
I-20 PT	2062.2	2040.2	3417.3/3405.7		04:51	2944	2963.04/2955.2		174.1	05:00	3418.0/3405.7		V. GOOD TEST 9.68 GOOD PERM
I-21 PT	1914.0	1892.0	3174.9/3165.1		5:20	1025							TOO TIGHT
I-22 PT	1904.5	1882.5	3159.2/3147.3		5:35	2413	2733.54/2723.5		173.9	5:44	3159.2/3146.8		GOOD TEST. GOOD PERM 9.69
I-23 PT	1831.0	1809.0	3038.1/3027.2		5:50	2488	2629.14/2619.4		172.0	6:05	3038.4/3025.9		GOOD TEST. GOOD PERM 9.69
I-24 PT	1694.0	1672.0	2812.8/2799.3		6:19	2400	2432.80/2424.2		167.4	6:35	2814.2/2799.9		GOOD TEST. GOOD PERM 9.69

(39821/22)

RFT PRESSURE DATA

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WELL: KIPPER #2

GEOLOGIST/ENGINEER: V. BINNS/L. FINLAYSON/
I. PALMER/Y. HEINDRICH

DATE: 10/4/87

RFT No. Run/Seat	Depth		Initial Hydrostatic	Time	Minimum	Formation Pressure	Temp	Time	Final Hydrostatic	Comments	
	m MDKB	m TVDSS KB=22	HP / RFT gauge psia / psig	Set	Flowing Pressure psia (Pretest)	HP / RFT gauge psia / psig	°F	Retract	HP / RFT gauge psia / psig	(Include Probe type)	
	RFT TYPE									M = Martineau probe	
2-25	SAMPLE	2308.0	2386.0	3817.4/3805.3	09:08	2888	3337.46/3327.2	192	08:55	3815.6/3803.3	M. PROBE FORMATION PRESSURE IS FINAL BUILDUP
3-26	SAMPLE	2318.2	2296.2	3831.4/3819.6	12:56	900					TOO TIGHT FOR SAMPLE
3-27	SAMPLE	2318.4	2296.4	3832.01/3819.0	13:02	2970	3348.85/3335.5	196.2	13.23	3832.9/3818.4	GOOD PERM. QUICK SAMPLE
4-28	SAMPLE	2303.0	2281.0	3808.5/3794.7	16:48	2620	3337.0/3324.3	191.5	17:29	3808.2/3794.2	GOOD PERM. GOOD SAMPLE
5-29	SAMPLE	2305.2	2283.2	3811.6/3797.5	20:31	2717	3338.5/3325.6	192.2	21:06	3811.6/3796.4	GOOD
6-30	SAMPLE	2334.2	2312.2	3860.0/3847.7	23:54	2509	3371.5/3358.9	204.9	00:41	3857.0/3843.6	
7-31	SAMPLE	2277.2	2255.2	3766.0/3751.8	03:12	3254	3332.7/3319.9	194.0	03:27	3764.6/3749.7	VERY HIGH PERM
8-32	SAMPLE	2321.2	2299.2	3835.0/3823.0	06:38	2786	3351.1/3340.5	206.6	07:12	3835.0/3822.3	FAIR TEST
9-33		2306.5	2284.5	3815.0/3800.0	10:03		3341/3327.7	202.0	11:37	3811.0/3796.5	VALID - VERY TIGHT

(39821:23)

RFT SAMPLE TEST REPORT

Well : Kipper-2

OBSERVER : V.J. Binns/I.D. Palmer DATE : 10/4/87

RUN NO. : 2

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	2/25			
DEPTH	2308	mKB	2308	mKB
A. RECORDING TIMES				
Tool Set	09:07:01	hrs	-	hrs
Chamber Open	09:10:50	hrs	09:43:41	hrs
Chamber Full	09:43:10	hrs	09:49:35	hrs
Fill Time	32:20	mins	06:06	mins
Finish Build Up	-	hrs	09:53:50	hrs
Build Up Time	-	mins	04:15	mins
Tool Retract		hrs	09:54:00	hrs
Total Time		mins	47:00	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3817.4	psia	-	psia
Initial Form'n Press.	3339.8	psia	-	psia
Initial Flowing Press.	72	psia	1080.5	psia
Final Flowing Press.	3337.8	psia	3328.8	psia
Final Formation Press.	-	psia	3337.4	psia
Final Hydrostatic	-	psia	3815.6	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	2340	m
Max. Rec. Temp	191	deg F	192	deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	9/ 4/87	04:45 hrs	9/ 4/87
Time since Circ.		hrs mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	1700	psig		psig
Amt Gas	44.6	cu ft		cu ft
Amt Oil	10.5	lit		lit
Amt Water (Total)	4.0	lit		lit
Amt Others	-	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	19.764%	ppm		ppm
C2	5.881	ppm		ppm
C3	1.896	ppm		ppm
C4	0.612	ppm		ppm
C5	not measured	ppm		ppm
C6+	not measured	ppm		ppm
CO2/H2S	No H2S	%/ppm		%/ppm
Oil Properties	39 deg API@	28 deg C	deg API@	deg C
Colour	tan-brown			
Fluorescence	pale yellow white bright			
GOR				
Pour Point	31°			
Water Properties				
Resistivity	0.238ohm-m @	22 deg C	ohm-m @	deg C
NaCl Equivalent	27,500	ppm		ppm
Cl-titrated	19,100	ppm		ppm
Tritium	2756 / 2733	DPM		DPM
pH	7.2			
Est. Water Type	fitrate			
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @	17 deg C	ohm-m @	deg C
NaCl Equivalent	31,500	ppm		ppm
Cl-titrated	19,500	ppm		ppm
pH	10.6			
Tritium (in Mud)	3000 - 3200	DPM		DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg		ppg
Calc. Hydrostatic	3780	psig		psi
Serial No. (Preserved)	-			
Choke Size/Probe Type	1x30/1000/Martineau		1x30/1000/Martineau	
REMARKS	Ca++ sample 230 mg/l			
	Ca++ m.f. 60 mc/l			

RFT SAMPLE TEST REPORT

Well : Kipper-2

OBSERVER : V.J. Binns/I.D. Palmer DATE : 10/4/87

RUN NO. : 3

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	3/27			
DEPTH	2318.4	mKB	mKB	
A. RECORDING TIMES				
Tool Set	13:00:47	hrs	hrs	
Chamber Open	13:03:09	hrs	13:14:00	hrs
Chamber Full	13:12:30	hrs	13:16:00	hrs
Fill Time	9:21	mins	2:00	mins
Finish Build Up	-	hrs	-	hrs
Build Up Time	-	mins	-	mins
Tool Retract	-	hrs	13:21:15	hrs
Total Time	-	mins	21:32	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3832.0	psia	-	psia
Initial Form'n Press.	3349.1	psia	-	psia
Initial Flowing Press.	814.2	psia	890.4	psia
Final Flowing Press.	3311.6	psia	3341.9	psia
Final Formation Press.	-	psia	3348.9	psia
Final Hydrostatic	-	psia	3832.9	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	-	m
Max. Rec. Temp	189	deg F	-	deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	9/ 4/87	04:45 hrs	9/ 4/87
Time since Circ.	hrs	mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	700	psig	approx. 50	psig
Amt Gas	5.0	cu ft	0.35	cu ft
Amt Oil	0.25	lit	0.25	lit
Amt Water (Total)	20.0	lit	3.0	lit
Amt Others	-	lit	-	lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	70.28%	ppm	61.11%	ppm
C2	6.39%	ppm	5.28%	ppm
C3	1.56%	ppm	1.02%	ppm
C4	1.16%	ppm	0.89%	ppm
C5	not measured	ppm	-	ppm
C6+	not measured	ppm	-	ppm
CO2/H2S	No H2S	%/ppm	-	%/ppm
Oil Properties	39 deg API@	28 deg C	deg API@	deg C
Colour	brown		bright brown	
Fluorescence	bright pale yellow-white		bright pale yellow-white	
GOR				
Pour Point				
Water Properties				
Resistivity	0.238ohm-m @	22 deg C	0.238ohm-m @	22 deg C
NaCl Equivalent	28,500	ppm	27,000	ppm
Cl-titrated	19,100	ppm	18,200	ppm
Tritium	3030	DPM	2989	DPM
pH	7.0 / 210		7.0 / 160	
Est. Water Type	fiftrate		fiftrate	
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @	17 deg C	0.214ohm-m @	22 deg C
NaCl Equivalent	31,500	ppm	31,500	ppm
Cl-titrated	19,500	ppm	19,500	ppm
pH	10.6		10.6	
Tritium (in Mud)	2800 - 3000	DPM	2800 - 3000	DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic		psig		psi
Serial No. (Preserved)	-		-	
Choke Size/Probe Type	1x40/1000/Martineau		1x30/1000/Martineau	
REMARKS				

RFT SAMPLE TEST REPORT

Well : KIPPER-2

OBSERVER : V. BINNS

DATE : 10/4/87

RUN NO. : 4

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	4/28			
DEPTH	2303.0	mKB	mKB	
A. RECORDING TIMES				
Tool Set	16:48:13	hrs	-	hrs
Chamber Open	16:50:23	hrs	17:14:35	hrs
Chamber Full	17:12:43	hrs	17:16:35	hrs
Fill Time	22:20	mins	02:00	mins
Finish Build Up	-	hrs	17:20:25	hrs
Build Up Time	-	mins	00:03:50	mins
Tool Retract	-	hrs	17:29:30	hrs
Total Time	-	mins	41.17	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3805.5	psia	-	psia
Initial Form'n Press.	3337.0	psia	-	psia
Initial Flowing Press.	34	psia	1068.0	psia
Final Flowing Press.	3318.3	psia	1500.0	psia
Final Formation Press.	-	psia	3302.0	psia
Final Hydrostatic	-	psia	3808.2	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	2340	m
Max. Rec. Temp	191.9	deg F	191.9	deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	09/04/87	04:45 hrs	09/04/87
Time since Circ.		hrs mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	2000	psia		psia
Amt Gas	121.8	cu ft		cu ft
Amt Oil	-	lit		lit
Amt Water (Total) mf	1.5	lit		lit
Amt Others: Condensate	0.5	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	20.66%	ppm		ppm
C2	6.813%	ppm		ppm
C3	1.463%	ppm		ppm
C4	0.591%	ppm		ppm
C5	0.06%	ppm		ppm
C6+	N. MEASURED	ppm		ppm
CO2/H2S	NO H2S	%/ppm		%/ppm
Oil Properties				
Colour		deg API@		deg C
Fluorescence				
GOR				
Pour Point				
Water Properties				
Resistivity	.263 ohm-m @	22 deg C	ohm-m @	deg C
NaCl Equivalent	24,000	ppm		ppm
Cl-titrated	17,200	ppm		ppm
Tritium	2651	DPM		DPM
pH/Ca++	7.0			
Est. Water Type	FILTRATE			
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @	17 deg C	ohm-m @	deg C
NaCl Equivalent	31,500	ppm		ppm
Cl-titrated	19,500	ppm		ppm
pH	10.6			
Tritium (in Mud)	3000-3200	DPM		DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	3772	psi	3772	psi
Serial No. (Preserved)	-		RFS AD 1062	
Choke Size/Probe Type	1x30/1000/ MARTINEAU		1x.03/ MARTINEAU	
REMARKS				

RFT SAMPLE TEST REPORT

Well : KIPPER-2

OBSERVER : V. BINNS

DATE : 11/4/87

RUN NO. : 5

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	5/29			
DEPTH	2305.2	mKB	2305.2	mKB
A. RECORDING TIMES				
Tool Set	20:31:45	hrs	-	hrs
Chamber Open	20:34:00	hrs	20:58:30	hrs
Chamber Full	20:57:00	hrs	21:06:00	hrs
Fill Time	23:00	mins	7:30	mins
Finish Build Up	-	hrs	21:05:20	hrs
Build Up Time	-	mins	00:06:50	mins
Tool Retract	-	hrs	21:08:15	hrs
Total Time	-	mins	-	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3811.6	psia	-	psia
Initial Form'n Press.	3338.5	psia	-	psia
Initial Flowing Press.	80.0	psia	1036.0	psia
Final Flowing Press.	3260.5	psia	3315.1	psia
Final Formation Press.	-	psia	3338.0	psia
Final Hydrostatic	-	psia	3811.6	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	2340	m
Max. Rec. Temp	192.2	deg C	196.4	deg C
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	09/04/87	04:45 hrs	09/04/87
Time since Circ.		hrs mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	1800	psia	1875	psia
Amt Gas	41.5	cu ft	14.8	cu ft
Amt Cond.	0.25	lit	SCUM	lit
Amt Water (Total) Filt.	14.5	lit	1.25	lit
Amt Others	-	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	20.614%	ppm	20.627%	ppm
C2	6.468%	ppm	6.890%	ppm
C3	2.806%	ppm	3.627%	ppm
C4	0.812%	ppm	0.918%	ppm
C5	0.091%	ppm	0.087%	ppm
C6+	N. MEASURED	ppm	N. MEASURED	ppm
CO2/H2S	NO H2S	%/ppm	NO H2S	%/ppm
Oil Properties				
Colour		deg API@		deg C
Fluorescence				
GOR				
Pour Point				
Water Properties				
Resistivity	0.231ohm-m @ 22	deg C	0.261ohm-m @ 22	deg C
NaCl Equivalent	28,000	ppm	23,500	ppm
Cl-titrated	19,500 @ 20	ppm	18,800 @ 20	ppm
Tritium	3030	DPM	-	DPM
pH/Ca++	7.0/220		7.0/160	
Est. Water Type	FILTRATE		FILTRATE	
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @ 17	deg C	0.214ohm-m @ 17	deg C
NaCl Equivalent	31,500	ppm	31,500	ppm
Cl-titrated	19,500	ppm	19,500	ppm
pH	10.6		10.6	
Tritium (in Mud)	3000-3200	DPM	3000-3200	DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	2307	psi	2307	psi
Serial No. (Preserved)	-			
Choke Size/Probe Type	1x40/1000/ MARTINEAU		1x30/1000/ MARTINEAU	
REMARKS				

RFT SAMPLE TEST REPORT

Well : Kipper-2

OBSERVER : V.J. Binns

DATE : 10/4/87

RUN NO. : 6

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	6/30			
DEPTH	2334.2	mKB	2334.2	mKB
A. RECORDING TIMES				
Tool Set	23:54:25	hrs		hrs
Chamber Open	23:56:37	hrs	00:33:54	hrs
Chamber Full	00:33:15	hrs	00:37:51	hrs
Fill Time	38:50	mins	3:57	mins
Finish Build Up		hrs	00:41:44	hrs
Build Up Time		mins	7:50	mins
Tool Retract		hrs	00:41:44	hrs
Total Time		mins		mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3860.0	psia	-	psia
Initial Form'n Press.	3371.5	psia	-	psia
Initial Flowing Press.	28	psia	125	psia
Final Flowing Press.	3368.99	psia	3369	psia
Final Formation Press.	-	psia	3371.0	psia
Final Hydrostatic	-	psia	3857.5	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	204.9	m
Max. Rec. Temp	197.8	deg F		deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	9/ 4/87	04:45 hrs	9/ 4/87
Time since Circ.		mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	350	psig	320	psig
Amt Gas	-	cu ft	-	cu ft
Amt Oil	-	lit	-	lit
Amt Water (Total)	22.0	lit	3.75	lit
Amt Others	-	lit	-	lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1		ppm		ppm
C2		ppm		ppm
C3		ppm		ppm
C4		ppm		ppm
C5		ppm		ppm
C6+		ppm		ppm
CO2/H2S	No H2S	%/ppm	No H2S	%/ppm
Oil Properties				
Colour	deg API@	deg C	deg API@	deg C
Fluorescence				
GOR				
Pour Point				
Water Properties				
Resistivity	0.232ohm-m @ 21	deg C	0.238ohm-m @ 20	deg C
NaCl Equivalent	27,600	ppm	27,400	ppm
Cl-titrated	19,000	ppm	18,500	ppm
Tritium	2789	DPM	2240	DPM
pH / Ca++	7.0 / 180	ppm	7.0 / 200	ppm
Est. Water Type	mostly filtrate		filtrate + formation H2O	
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @ 17	deg C	0.214ohm-m @ 17	deg C
NaCl Equivalent	31,500	ppm	31,500	ppm
Cl-titrated	19,500	ppm	19,500	ppm
pH	10.6		10.6	
Tritium (in Mud)	2800 - 3000	DPM	2800 - 3000	DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	3823	psig	3823	psi
Serial No. (Preserved)	-		-	
Choke Size/Probe Type	1x30/1000/Martineau		1x30/1000/Martineau	
REMARKS				

RFT SAMPLE TEST REPORT

Well : KIPPER-2

OBSERVER : V. BINNS

DATE : 11/4/87

RUN NO. : 7

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	7/31			
DEPTH	2277.2	mKB	2277.3	mKB
A. RECORDING TIMES				
Tool Set	03:12:00	hrs	-	hrs
Chamber Open	03:14:45	hrs	03:22:30	hrs
Chamber Full	03:20:40	hrs	03:23:40	hrs
Fill Time	5:55	mins	1:10	mins
Finish Build Up	-	hrs	03:25:00	hrs
Build Up Time	-	mins	2:30	mins
Tool Retract	-	hrs	03:27:00	hrs
Total Time	-	mins	15.00	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3766.0	psia	-	psia
Initial Form'n Press.	3332.7	psia	-	psia
Initial Flowing Press.	3000.0	psia	3169.0	psia
Final Flowing Press.	3225.0	psia	3200.0	psia
Final Formation Press.	-	psia	3330.5	psia
Final Hydrostatic	-	psia	3764.6	psia
C. TEMPERATURE				
Max. Tool Depth	2310	m	2310	m
Max. Rec. Temp	188.5	deg F	194.0	deg C
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	09/04/87	04:45 hrs	09/04/87
Time since Circ.		mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	2050	psia		psia
Amt Gas	123.8	cu ft		cu ft
Amt Oil	-	lit		lit
Amt Water (Total) mf	0.75	lit		lit
Amt Others: Condensate	0.5	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	21.167%	ppm		ppm
C2	6.562%	ppm		ppm
C3	1.841%	ppm		ppm
C4	0.601%	ppm		ppm
C5	0.09%	ppm		ppm
C6+	N. MEASURED	ppm		ppm
CO2/H2S	NO H2S	%/ppm		%/ppm
Oil Properties	57 deg API@ 22.5deg C		deg API@	deg C
Colour	CLEAR PALE GREEN			
Fluorescence	BRIGHT BLUE WHITE			
GOR				
Pour Point				
Water Properties				
Resistivity	.32 ohm-m @ 19 deg C		ohm-m @	deg C
NaCl Equivalent	20,000	ppm		ppm
Cl-titrated	14,500	ppm		ppm
Tritium	2325	DPM		DPM
pH/Ca++	7 - 8 / 300			
Est. Water Type	FILTRATE & FORMATION			
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @ 17 deg C		0.214ohm-m @ 17 deg C	
NaCl Equivalent	31,500	ppm	31,500	ppm
Cl-titrated	19,500	ppm	19,500	ppm
pH	10.6			
Tritium (in Mud)	3600-3800	DPM	3600-3800	DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	3730	psi	3730	psi
Serial No. (Preserved)	-		RFS AD 1120	
Choke Size/Probe Type	1x40/1000/ MARTINEAU		1x30/1000/ MARTINEAU	
REMARKS	CALCULATED VIA PHENALPTHALENE			

RFT SAMPLE TEST REPORT

Well : Kipper-2

OBSERVER : V.J. Binns

DATE : 11/4/87

RUN NO. : 8

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	8/32			
DEPTH	2321.2	mKB	2321.2	mKB
A. RECORDING TIMES				
Tool Set	6:38:21	hrs	-	hrs
Chamber Open	6:40:31	hrs	7:05:02	hrs
Chamber Full	7:03:00	hrs	7:09:04	hrs
Fill Time	22:29	mins	4:02	mins
Finish Build Up	-	hrs	7:11:15	hrs
Build Up Time	-	mins	6:13	mins
Tool Retract	-	hrs	7:12:06	hrs
Total Time	-	mins	-	mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3835.0	psia	-	psia
Initial Form'n Press.	3351.1	psia	-	psia
Initial Flowing Press.	26	psia	202	psia
Final Flowing Press.	2374.0	psia	608.78	psia
Final Formation Press.	-	psia	3351.1	psia
Final Hydrostatic	-	psia	3835.0	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	2340	m
Max. Rec. Temp	196.3	deg F	206.6	deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	9/ 4/87	04:45 hrs	9/ 4/87
Time since Circ.		mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	420	psig	290	psig
Amt Gas	-	cu ft	-	cu ft
Amt Oil	-	lit	-	lit
Amt Water (Total)	20.8	lit	3.7	lit
Amt Others	-	lit	-	lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1		ppm		ppm
C2		ppm		ppm
C3		ppm		ppm
C4		ppm		ppm
C5		ppm		ppm
C6+		ppm		ppm
CO2/H2S		%/ppm		%/ppm
Oil Properties				
deg API@		deg C		deg C
Colour				
Fluorescence				
GOR				
Pour Point				
Water Properties				
Resistivity	0.241ohm-m @ 26	deg C	0.245ohm-m @ 24	deg C
NaCl Equivalent	23,500	ppm	24,500	ppm
Cl-titrated	18,800	ppm	19,000	ppm
Tritium	1830	DPM	1258	DPM
pH / Ca++	ppm	7-8 / 200	7-8 / 240	
Est. Water Type		fitrate/formation		formation
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @ 17	deg C	0.214ohm-m @ 17	deg C
NaCl Equivalent	31,500	ppm	31,500	ppm
Cl-titrated	19,500	ppm	19,500	ppm
pH	10.6		10.6	
Tritium (in Mud)	2800 - 3000	DPM	2800 - 3000	DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	3802	psig	3802	psi
Serial No. (Preserved)	-		-	
Choke Size/Probe Type	1x30/1000/Martineau		1x.03/1000/Martineau	
REMARKS				

RFT SAMPLE TEST REPORT

Well : KIPPER-2

OBSERVER : V. BINNS

DATE : 11/4/87

RUN NO. : 9

	CHAMBER 1 (22.8 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	9/33		9/33	
DEPTH	2306.5	mKB	2306.5	mKB
A. RECORDING TIMES				
Tool Set	10:03:45	hrs	-	hrs
Chamber Open	10:06:00	hrs	11:08:30	hrs
Chamber Full	-	hrs	11:20:00	hrs
Fill Time	-	mins	11:30	mins
Finish Build Up	-	hrs	-	hrs
Build Up Time	-	mins	-	mins
Tool Retract	-	hrs	11:37:00*	hrs
Total Time	-	mins		mins
B. SAMPLE PRESSURE				
Initial Hydrostatic	3815.0	psia	-	psia
Initial Form'n Press.	3341.5	psia	-	psia
Initial Flowing Press.	50.2	psia	449.0	psia
Final Flowing Press.	1522.0	psia	3200.0	psia
Final Formation Press.	-	psia	-	psia
Final Hydrostatic	-	psia	3811.0	psia
C. TEMPERATURE				
Max. Tool Depth	2340	m	2340	m
Max. Rec. Temp	191.0	deg F	202.0	deg F
Length of Circ.		hrs		hrs
Time/Date Circ. Stopped	04:45 hrs	09/04/87	04:45 hrs	09/04/87
Time since Circ.		hrs mins		hrs
D. SAMPLE RECOVERY				
Surface Pressure	1200	psia		psia
Amt Gas	34.4	cu ft		cu ft
Amt Oil Cond.	9.25	lit		lit
Amt Water (Total) mf	4.0	lit		lit
Amt Others	-	lit		lit
E. SAMPLE PROPERTIES				
Gas Composition				
C1	20.269%	ppm		ppm
C2	7.935%	ppm		ppm
C3	3.073%	ppm		ppm
C4	0.860%	ppm		ppm
C5	0.054%	ppm		ppm
C6+	-	ppm		ppm
CO2/H2S	-	%/ppm		%/ppm
Oil Properties	34 deg API@ 26.1deg C		deg API@	deg C
Colour	TAN BROWN			
Fluorescence	PALE YELL/WHITE(BRIGHT)			
GOR				
Pour Point				
Water Properties				
Resistivity	.235 ohm-m @ 21 deg C		ohm-m @	deg C
NaCl Equivalent	27,500	ppm		ppm
Cl-titrated	19,500	ppm		ppm
Tritium	3,332	DPM		DPM
pH/Ca++ ppm	7-8/280			
Est. Water Type	FILTRATE			
F. MUD FILTRATE PROPERTIES				
Resistivity	0.214ohm-m @ 17 deg C		ohm-m @	deg C
NaCl Equivalent	31,500	ppm		ppm
Cl-titrated	19,500	ppm		ppm
pH	10.6			
Tritium (in Mud)	2800-3000	DPM		DPM
G. GENERAL CALIBRATION				
Mud Weight	9.6	ppg	9.6	ppg
Calc. Hydrostatic	3778	psi	3778	psi
Serial No. (Preserved)	-			
Choke Size/Probe Type	1x.03/ MARTINEAU		1x.03/ MARTINEAU	
REMARKS	* 6 Gal reopened after 1 Gal filled		RFS.ad.1123	

Appendix 5

SCHLUMBERGER

VELOCITY SURVEY REPORT

(Previously distributed)

SEPARATE ATTACHMENT (PE 906060)