

WCR vol. 1
Mulloway-1
(W988)



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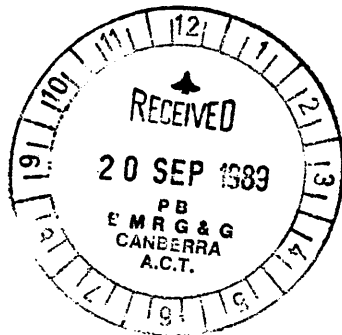
WELL COMPLETION REPORT
MULLOWAY-1

VOLUME 1
BASIC DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

COMPILED
G. SMITH
A. CLARE



AUGUST 1989

ESSO AUSTRALIA LTD

1. WELL DATA RECORD

MULLOWAY-1

LOCATION : Latitude : 38⁰ 19' 24.26" South
Longitude : 147⁰ 29' 01.79" East
X = 542292.12
Y = 5758175.75
Map Projection: UTM Zone 55
Geographical Location: Bass Strait,
Victoria
Field: Mulloway-1

PERMIT : Vic/P27

ELEVATION : 21m

WATER DEPTH : 37m

TOTAL DEPTH : 1721m Driller, 1723.5m Logger.

PLUG BACK TYPE : Cement Plug (100m-165m)

REASONS FOR
PLUGGING BACK : Cased and Suspended

MOVE IN : 07/02/89 0030 hours

SPUDDED : 08/02/89 2315 hours

REACHED T.D. : 18/02/89 1115 hours

RIG RELEASED : 24/02/89 0630 hours

OPERATOR : Esso Exploration and Production
Australia Inc.

PERMITTEE OR LICENCEE : Esso Exploratiog and Production Aust. Inc.
BHP Petroleum (Australia) Pty. Ltd.

ESSO INTEREST : 50%

OTHER INTEREST : 50%

CONTRACTOR : South Seas Drilling Company

RIG NAME : Southern Cross

EQUIPMENT TYPE : Semi-submersible

TOTAL RIG DAYS : 17.45

DRILLING AFE NO. : 239002 (Segment 34)

TYPE COMPLETION : Cased and Suspended

WELL CLASSIFICATION : Before Drilling: New Field Wildcat
After Drilling: Cased and Suspended

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MULLOWAY-1

WELL COMPLETION REPORT

VOLUME 1: BASIC DATA

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Operations Summary

ESSO AUSTRALIA LTD.
MULLOWAY-1 FINAL WELL REPORT
Operations Summary

1. MOVING/MOORING

After bolstering the No. 1 anchor at the Harlequin-1 location, the Southern Cross was towed by the MV Lady Caroline to the Malloway-1 location. Anchor No. 1 was dropped at Malloway-1 at 0030 hours February 7, 1989, thus completing the 16.5nm tow in 4.75 hours at an average speed of 3.5 kts.

After making the chain/wire crossover on mooring line No. 1, smoke was detected in the port-aft column due to the No. 1 winch motor brake dragging. While repairing the brake the MV Lady Penelope set anchor No. 8. At this point the rig had drifted off position and the decision was made to pick up and respot anchor No. 1. However, upon retrieving the anchor, the stabilizer bar was discovered to be missing (see EFR No. 1). The MV's Lady Penelope and Canning Tide then ran the remaining anchors in 5 hours. (NOTE: After receiving a new anchor from shore, anchor No. 1 was successfully spotted on February 11.)

After retrieving the flukes of anchor No. 1 from the Lady Penelope, the anchors were load tested to 200 kips and the rig was moved 112m towards the called location. While attempting to recover the chain end and shank of anchor No. 1, 3.75 hours of NPT were recorded changing out the port crane line, which was damaged after jumping the crown sheave (see EFR No. 2). The rig was then ballasted down. When attempting to pretension the anchors to 100 kips, however, anchor chain No. 7 parted $\pm 90'$ from the chain/wire crossover (see EFR No. 3). Therefore, it was necessary to deballast the rig from the drilling draft of 21' up to 38' to gain access to the fairleader sheave and reterminate the chain. After repairing the chain and respotting the anchor, the rig was ballasted back down and the anchors were pretensioned to 100 kips. The TGB was then run and landed at a seafloor depth of 58m RKB. The rig position was determined to be 2m on a bearing of 110° from the called location.

2. DRILLING OPERATIONS

a) 26" Hole/20" Casing

After setting the TGB, the 26" bit/26" hole opener BHA was made up and stabbed into the TGB, thus spudding the Malloway-1 well at 2315 hours February 8, 1989. The 26" hole was drilled from 58m to 178m, at an average ROP of 13.0 mph, using seawater and high viscosity gel slugs to clean the hole. After sweeping the hole with 100 bbls of high viscosity mud, a Totco was dropped and the bit was pulled to the seafloor. The Totco was recovered and the bit was RIH. After washing 9m of fill, the hole was swept with 100 bbls of high viscosity mud, then 400 bbls of high viscosity mud were spotted in the hole. The drillstring was then POOH to run casing.

Eight joints of 20", 94 ppf, X-56, LS casing, plus a crossover joint (129 ppf, LS x ALT-2) and the 24" pile joint/18³/₄" Vetco SG-5 wellhead assembly were then run, with the 20" shoe at 170m. The casing was cemented to the seafloor, using a drillpipe stinger, with a lead slurry of 750 sx of Class 'G' cement plus 2.2% prehydrated gel and a tail slurry of 350 sx of Class 'G' neat cement.

The BOP stack was run and landed and the shear rams, wellhead connector and casing were tested to 500 psi.

b) 17 1/2" Hole/13 3/8" Casing

A 17 1/2" center jet bit and pendulum BHA were then picked up and RIH to the TOC at 169m. The cement and 20" casing shoe were drilled and the 17 1/2" hole was drilled from 178m to 776m, at an average ROP of 21.4 mph, using a seawater/gel mud system. After dropping a Totco, the drillstring was POOH and the BHC/GR/CAL log was run to TD.

The wear bushing was pulled and 59 joints of 13 3/8", 54.5ppf, K-55, BTC casing, plus the casing hanger pup joint (72 ppf, L-80) were run and landed with the shoe at 761m. The casing was cemented in place with 1000sx of Class 'G' neat cement. The estimated TOC was calculated to be at 261m based on an average hole diameter of 18" as per the caliper log. The top plug was bumped and the pressure was increased to 1500psi to test the casing. The 13 3/8" pack-off assembly could not be successfully energized on the initial attempt. After running the mill and flush tool to remove debris in the seal area, a new pack-off assembly was run and successfully energized. The pack-off and BOP stack were then tested to 200/2000 psi. A Phase I PIT was run against the shear rams to 1500 psi and the choke manifold was tested to 200/5000 psi.

c) 12 1/4" Hole/9 5/8" Casing

An HP11J bit and pendulum BHA including the MWD tool were then RIH. The cement plugs and float collar/float shoe were drilled out and 3m of hole was drilled to 779m, where a Phase II PIT was conducted to leakoff at 675 psi (14.2 ppg EMW).

The 12 1/4" hole was then drilled from 779m to 1340m in one bit run, at an average ROP of 20.3 mph. After drilling through the Gippsland Limestone and the Lakes Entrance claystone/siltstone formation, the Top of coarse clastics was picked at 1168m. While drilling this section, the mud system was gradually conditioned and the mud weight was increased to 9.5 ppg. When POOH from 1340m overpull ranging to 90 kips was experienced. (NOTE: The caliper log later showed the interval from the 13 3/8" casing shoe to 1170m to be washed out to a diameter of 14-15", while the hole below 1170m was generally in gauge except for washouts in coal stringers).

Upon RIH with an HP51A bit a bridge was reamed at 1112m and the interval from 1340m to 1380m was drilled through sandstone with interbeds of coal, at an average ROP of 12.3 mph. After observing fluorescence in the cuttings, the bit run was terminated after 3.25 hours in order to core.

A 12 1/4" core bit and core barrel, with the stabilizers turned down to 12" OD, were RIH and Core No. 1 was cut from 1380m to 1393.5m, at an average ROP of 5.4 mph. Core recovery was 62.2% and the corehead was judged as 5% worn. The corehead was then rerun and Core No. 2 was cut from 1393.5m to 1405.5m, at an average ROP of 16.0 mph. No recovery was obtained and the corehead was judged as 10% worn. (NOTE: Later, when picking up the core barrel on the Conger-1 well, 6.7m of Mulloway Core No. 2 was discovered in the barrel, resulting in an actual recovery of 55.8%).

The previously used HP51A bit was then rerun and the interval 1405.5-1567m was drilled at an average ROP of 10.6 mph. An HP53A was then picked up and used to drill to the programmed TD of 1721m, at an average ROP of 11.8 mph. Lithology throughout this section was predominantly sandstone with interbeds of siltstone and coal.

After circulating and conditioning the hole, electric logs were run as follows:

- Run No. 1 - DLL/MSFL/LDL/CNL/BHC/SP/GR/CAL/AMS
- Run No. 2 - RFT/GR (22 pressure pretests, 4 sample runs)
- Run No. 3 - SHDT/GR
- Run No. 4 - WSS (11 shotpoints)
- Run No. 5 - CST/GR (30 cores shot, 29 recovered)

Based on the evaluation of the logs the decision was made to run 95/8" casing to cover a potential completion zone at 1378-1400m and to temporarily abandon the well. Therefore, after completing final logs, open-ended drill pipe was RIH to 1590m and a 100m balanced cement plug (P&A Plug No. 1) was set to minimize the rathole below the 95/8" casing shoe, using 235sx of Class "G" neat cement mixed in freshwater. After setting the plug the pipe was POOH to 1490m and the hole was circulated clean. The open-ended drillpipe was then POOH. A 12 1/4" bit was run, the plug was tagged at 1481m and dressed to 1490m. The bit was then POOH to run casing.

The wear bushing was pulled and 117 joints of 95/8", 47 ppf, N-80, BTC casing, plus the casing hanger pup joint (47 ppf, L-80) were run and landed with the shoe at 1479m. Two short joints (± 10.5 m length) were run above the float collar joint to aid in future correlation (see Casing Data). Because of problems experienced with debris in the seal area during the 13 3/8" casing job, high viscosity mud was circulated down the kill line, while also circulating conventionally, to increase the carrying capacity in the riser. The casing was then cemented in place with 600 sx of Class 'G' cement with 0.2% HR6L retarder mixed in freshwater. The estimated TOC was calculated to be at 1095m based on an average hole diameter of 12.84" per the caliper log. The top plug was bumped and the pressure was increased to 1500 psi to test the casing. The pack-off assembly was energized and tested to 5000 psi and a Phase I PIT was run against the shear rams to 3500 psi. The wear bushing was then run and an 8 1/2" bit was RIH and tagged the wiper plugs at 1452m, ensuring adequate rathole below the completion zone.

3. PLUG & ABANDONMENT

While POOH after tagging the plugs, drillpipe and drill collars were laid down. Open-ended drillpipe was then RIH to 165m and a 65m balanced surface plug (P&A Plug No. 2) was set using 75 sx of Class 'G' neat cement mixed in seawater. Drillpipe was laid down, the wearbushing was retrieved and the BOP stack was pulled.

A corrosion cap was then run and set and guidelines Nos. 1, 2 and 3 were cut. An unsuccessful attempt was made to cut guideline No. 4; however, the cutting tool was found to have a broken blade. The decision was then made to attach a temporary marker buoy to the guideline, with plans for the MV Flinders Tide to retrieve the buoy/guideline and set a permanent marker buoy at a later date.

4. PULLING ANCHORS

After the rig was deballasted from drilling draft (48') to transit draft (21'), the MV's Eastern Tide and Lady Caroline retrieved the eight anchors in 21.25 hours. Included in this time was 5 hours of NPT spent untangling 7 of the 8 pendant lines. Under tow by the Lady Caroline, the rig departed for the Conger-1 well location at 0630 hours February 24, 1989.

Casing Data

ESSO AUSTRALIA LTD.
MULLOWAY-1 FINAL WELL REPORT
CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (M-RKB)	CENTRALIZER POSITION	REMARKS
20	94	X-56	LS	12.45	170	NONE	FLOAT SHOE JOINT
20	94	X-56	LS	80.87		NONE	7 INTERMEDIATE JOINTS
20	129	X-56	LS x ALT-2	11.40		NONE	CROSSOVER JOINT
24	670	----	ALT-2	9.90		NONE	PILE JOINT: VETCO SG-5
				=====			
				114.62			
13-3/8	54.5	K-55	BTC	12.22	761	1 W/ STOP RING	FLOAT SHOE JOINT
	54.5	K-55	BTC	11.85		1 ACROSS COLLAR	FLOAT JOINT
	54.5	K-55	BTC	12.88		1 W/ STOP RING	FLOAT COLLAR JOINT
	54.5	K-55	BTC	664.25		1 ACROSS FIRST TWO COLLARS	56 INTERMEDIATE JOINTS
	72	L-80	BTC	3.39		NONE	CASING HANGER PUP JOINT
				=====			
				704.59			-CSG HANGER: SG-5, TYPE T (LOCK RING REMOVED) -PACK-OFF ASSY: SG-5

ESSO AUSTRALIA LTD.
MULLOWAY-1 FINAL WELL REPORT
CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (M-RKB)	CENTRALIZER POSITION	REMARKS
9-5/8	47	N-80	BTC	12.06	1479	1 W/ STOP RING	FLOAT SHOE JOINT
	47	N-80	BTC	12.38		1 ACROSS COLLAR	FLOAT JOINT
	47	N-80	BTC	11.65		1 W/ STOP RING	FLOAT COLLAR JOINT
	47	N-80	BTC	1382.48		1 ACROSS FIRST TEN COLLARS	114 INTERMEDIATE JOINTS (AS PER TALLY ATTACHED)
	47	L-80	BTC	2.86		NONE	CASING HANGER PUP JOINT
				=====			-CSG HANGER: SG-5, TYPE T
				1421.43			(LOCK RING INSTALLED) -PACK-OFF ASSY: SG-5

ESSO AUSTRALIA LTD.
MULLOWAY-1 FINAL WELL REPORT
CASING DATA
(9-5/8" CASING TALLY)

JOINT NUMBER	LENGTH (m)	DEPTH (mRKB)	JOINT NUMBER	LENGTH (m)	DEPTH (mRKB)	JOINT NUMBER	LENGTH (m)	DEPTH (mRKB)	JOINT NUMBER	LENGTH (m)	DEPTH (mRKB)	REMARKS
CSG HGR	2.86	60.86	30	11.79	426.00	60	12.26	792.88	90	12.05	1155.07	
1	12.60	73.46	31	11.97	437.97	61	12.03	804.91	91	11.72	1166.79	
2	12.03	85.49	32	12.54	450.51	62	12.32	817.23	92	11.96	1178.75	
3	12.02	97.51	33	12.01	462.52	63	11.85	829.08	93	11.80	1190.55	
4	12.70	110.21	34	12.50	475.02	64	11.67	840.75	94	12.45	1203.00	
5	12.48	122.69	35	12.56	487.58	65	12.55	853.30	95	12.57	1215.57	
6	12.28	134.97	36	12.01	499.59	66	12.50	865.80	96	12.44	1228.01	
7	11.90	146.87	37	12.03	511.62	67	12.53	878.33	97	12.00	1240.01	
8	12.18	159.05	38	11.90	523.52	68	12.05	890.38	98	11.68	1251.69	
9	12.59	171.64	39	12.60	536.12	69	11.66	902.04	99	11.97	1263.66	
10	12.54	184.18	40	12.52	548.64	70	12.58	914.62	100	12.02	1275.68	
11	11.78	195.96	41	12.03	560.67	71	11.37	925.99	101	12.41	1288.09	
12	12.02	207.98	42	12.48	573.15	72	12.05	938.04	102	11.82	1299.91	
13	12.03	220.01	43	11.90	585.05	73	11.45	949.49	103	11.85	1311.76	
14	12.03	232.04	44	12.48	597.53	74	12.53	962.02	104	12.58	1324.34	
15	12.36	244.40	45	11.94	609.47	75	11.80	973.82	105	12.52	1336.86	
16	11.74	256.14	46	11.98	621.45	76	11.03	984.85	106	12.09	1348.95	
17	12.02	268.16	47	12.02	633.47	77	12.03	996.88	107	11.75	1360.70	
18	12.41	280.57	48	11.63	645.10	78	12.51	1009.39	108	12.47	1373.17	
19	11.79	292.36	49	11.77	656.87	79	12.02	1021.41	109	12.39	1385.56	
20	12.04	304.40	50	12.63	669.50	80	12.03	1033.44	110	11.60	1397.16	
21	12.57	316.97	51	12.45	681.95	81	12.59	1046.03	111	10.61	1407.77	SHORT JT F/ CORRELATING.
22	12.54	329.51	52	12.57	694.52	82	11.47	1057.50	112	12.50	1420.27	
23	12.00	341.51	53	12.48	707.00	83	11.67	1069.17	113	10.60	1430.87	SHORT JT F/ CORRELATING.
24	12.03	353.54	54	12.59	719.59	84	11.62	1080.79	114	12.47	1443.34	
25	11.68	365.22	55	12.57	732.16	85	12.46	1093.25	F.C. JT	11.65	1454.99	
26	12.05	377.27	56	12.49	744.65	86	12.31	1105.56	115	12.38	1467.37	
27	12.59	389.86	57	11.64	756.29	87	12.39	1117.95	F.S. JT	12.06	1479.43	
28	12.59	402.45	58	11.83	768.12	88	12.63	1130.58				
29	11.76	414.21	59	12.50	780.62	89	12.44	1143.02				

Cement Data

ESSO AUSTRALIA LTD.
MULLOWAY-1 FINAL WELL REPORT
CEMENT DATA

DATE (1989)	TYPE JOB	INTERVAL (M-RKB)	TYPE CEMENT	VOLUME (SX)	SLURRY WEIGHT (PPG)	ADDITIVES	MIX WATER	REMARKS
09-Feb	20" PRIMARY LEAD	170-58	CLASS "G"	750	13.2	2.2% PHG	FW	CEMENT THROUGH DP STINGER. CMT VOLUME AS PER PROGRAM TO PROVIDE 150% EXCESS ABOVE GAUGE HOLE VOLUME W/ TOC @ SEAFLOOR.
09-Feb	20" PRIMARY TAIL		CLASS "G"	350	15.8	----	SW	
12-Feb	13-3/8" PRIMARY	761-261	CLASS "G"	1000	15.8	----	SW	CMT VOLUME BASED ON 18" AVG. HOLE DIAMETER PER THE CALIPER LOG. BUMPED PLUG W/ 1500 PSI.
20-Feb	P & A PLUG No.1	1590-1490	CLASS "G"	235	15.8	----	FW	SET IN OPEN HOLE TO MINIMIZE RAT HOLE BELOW 9-5/8" CASING SHOE. TAGGED @ 1481m, DRESSED TO 1490m.
21-Feb	9-5/8" PRIMARY	1479-1095	CLASS "G"	600	15.8	0.2% HR6L	FW	CEMENT VOLUME BASED ON 12.84" AVERAGE HOLE DIAMETER PER THE CALIPER LOG.
22-Feb	P & A PLUG No.2	165-100	CLASS "G"	75	15.8	----	SW	SURFACE PLUG IN 9-5/8" CASING.

Samples, Conventional Cores,
Sidewall Cores

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

MULLOWAY-1

<u>INTERVAL (m)</u>	<u>TYPE</u>
776 - 1721	Cutting samples - 4 sets of washed and oven dried and 1 set of bagged air dried cuttings. Samples from 776 - 1050m at 30m intervals. Samples from 1050 - 1080m at 5m intervals. Samples from 1080 - 1180m at 10m intervals. Samples from 1180 - 1721m at 5m intervals.
776 - 1721	Unwashed composite tinned samples for geochemistry collected at 30m/15m intervals.
1380 - 1393.5	Core #1 (Aluminium Sleeved). Recovery of 8.4m (62.2%)
1393.5 - 1405.5	Core #2 (Aluminium Sleeved). Recovery of 6.7m (55.8%)
1137 - 1696.5m	CST, 30 Shot, Recovered and Brought 29.

6. WIRELINE LOGS AND SURVEYS
MULLOWAY-1

<u>TYPE AND SCALE</u>		<u>FROM</u>	<u>TO</u>
	<u>SUITE 1</u>		
BHC-CAL-GR	1:200 1:500	768.5	169.7
	<u>SUITE 2</u>		
DLL-MSFL-GR-SP)	1:200	1718.5	761.0
)	1:500		
BHC-CAL-GR) 'SUPER COMBO'	1:200	1695.0	761.0
)	1:500		
LDL-CNL-GR-AMS)	1:200	1706.0	1095.0
)	1:500		
RFT-HP-GR	(22 pretest/4 sample runs)	1682.0	1184.5
SHDT-GR	1:200	1718.0	1098.0
WSS	11 levels	1690.0	779.0
CST-GR (1 Gun)	(30 Shots)	1696.5	1137.0

*Wireline Formation Test
Summary*

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - MULLOWAY-1

<u>TEST & SEAT NO.</u>	<u>DEPTH (METRES) K.B.</u>	<u>CHAMBER</u>	<u>RECOVERY (LITRES)</u>				<u>FORMATION WATER</u>	<u>MUD FILTRATE</u>	<u>HEWLETT-PACKARD FORMATION PRESSURE</u>		<u>HEWLETT-PACKARD HYDROSTATIC PRESSURE</u>		<u>REMARKS</u>
			<u>OIL</u>	<u>COND.</u>	<u>GAS</u>	<u>COND.</u>			<u>MPaa</u>	<u>Psia</u>	<u>MPaa</u>	<u>Psia</u>	
		Litres	Litres	Litres	m ³	Litres	Litres						
1/1	1184.5	Pretest						-	-	13.39	1941.6	Tight	
1/1a	1185.0	Pretest						11.56	1676.6	13.40	1942.9	Good	
1/2	1355.0	Pretest						13.21	1915.5	15.31	2221.1	Good	
1/3	1373.0	Pretest						13.39	1941.86	15.52	2250.7	Good	
1/4	1379.3	Pretest						13.5	1958.01	15.59	2260.9	Good	
1/5	1379.5	Pretest						13.5	1957.94	15.59	2261.4	Good	
1/6	1384.0	Pretest						13.52	1961.54	15.64	2268.9	Good	
1/7	1385.0	Pretest						13.53	1962.65	15.66	2271.1	Good	
1/8	1386.2	Pretest						13.55	1964.91	15.67	2272.9	Suspect supercharged	
1/8a	1386.0	Pretest						13.54	1964.51	15.67	2272.4	Suspect supercharged	
1/9	1390.3	Pretest						13.56	1966.86	15.72	2279.6	Good	
1/10	1391.8	Pretest						13.57	1968.6	15.73	2282.1	Good	
1/11	1394.0	Pretest						13.59	1971.08	15.76	2285.8	Good	
1/12	1395.0	Pretest						13.60	1972.41	15.77	2287.5	Good	
1/13	1397.0	Pretest						13.62	1975.03	15.79	2290.8	Good	
1/14	1399.0	Pretest						13.64	1977.91	15.82	2294.3	Good	
1/15	1402.2	Pretest						13.67	1982.42	15.85	2299.5	Good	
1/16	1412.0	Pretest						-	-	-	-	Lost seal	
1/16a	1410.0	Pretest						13.76	1995.88	15.94	2312.2	Good	
1/17	1423.0	Pretest						13.89	2014.42	16.09	2333.7	Good	
1/18	1682.0	Pretest						16.45	2385.92	19.00	2755.4	Good	
1/19	1394.5	Pretest						13.59	1971.82	15.77	2287.6	Good	

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - MULLOWAY-1

<u>TEST & SEAT NO.</u>	<u>DEPTH (METRES) K.B.</u>	<u>CHAMBER</u>	<u>OIL</u>	<u>RECOVERY (LITRES)</u>		<u>FORMATION WATER</u>	<u>MUD FILTRATE</u>	<u>HEWLETT-PACKARD FORMATION PRESSURE</u>		<u>HEWLETT-PACKARD HYDROSTATIC PRESSURE</u>		<u>REMARKS</u>
				<u>COND.</u>	<u>GAS</u>			<u>MPaa</u>	<u>Psia</u>	<u>MPaa</u>	<u>Psia</u>	
		Litres	Litres	Litres	m ³	Litres	Litres					
2/20	1395.0	-	-	-	-	-	-	-	-	15.78	2289.2	Seal failure
2/20a	1394.9	27.28 4.55	20.5	-	Neg	0.0	0.5	13.60	1972.93	15.78	2289.2	Opened on rig floor - preserved Preserved
3/21	1379.5	-	-	-	-	-	-	-	-	15.60	2262.8	"Overspeed" abort
3/21a	1379.5	27.28 12.73	4.3	-	Neg	0.0	17.0	13.50	1958.39	15.60	2262.7	Opened on rig floor/seal failure Seal failure
4/22	1395.9	-	-	-	-	-	-	-	-	15.77	2287.4	"Overspeed" abort
4/22a	1395.9	-	-	-	-	-	-	-	-	15.77	2287.4	Seal failure
4/22b	1395.8	27.28 4.55	19.5	-	Neg	1.6	-	13.60	1972.68	15.77	2286.8	Opened on rig floor - preserved Preserved
5/23	1396.8	27.28 4.55	0.0	-	Neg	22.0	-	13.62	1975.04	15.78	2288.5	Formation water/opened on rig floor Opened on rig floor

Temperature Record

8. TEMPERATURE RECORD - MULLOWAY-1

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>						
BHC-CAL-GR	750.6	42	45M(.75)	4H 30M(4.5)		
<u>Suite 2</u>						
DLL-MSFL-LDL-CNL-BHC-GR-SP	1687.3	64)	1H 10M (1.17)	7H 05M(7.083))	75.°C	39.09
RFT-HP-GR	1673.5	70)		13H 10M(13.17))		
SHDT	1712	72.5)		33H 5M(33.08))		
WSS	1690	73.4)		35H 26M(35.87))		
CST's	No Thermometers Run					

Figures

- Locality Map.

- Progress Curve

- Wellbore Schematic

- Temperature Plot

- Abandonment Schematic.

LOCALITY MAP

MULLOWAY-1

SCALE 1 : 250 000

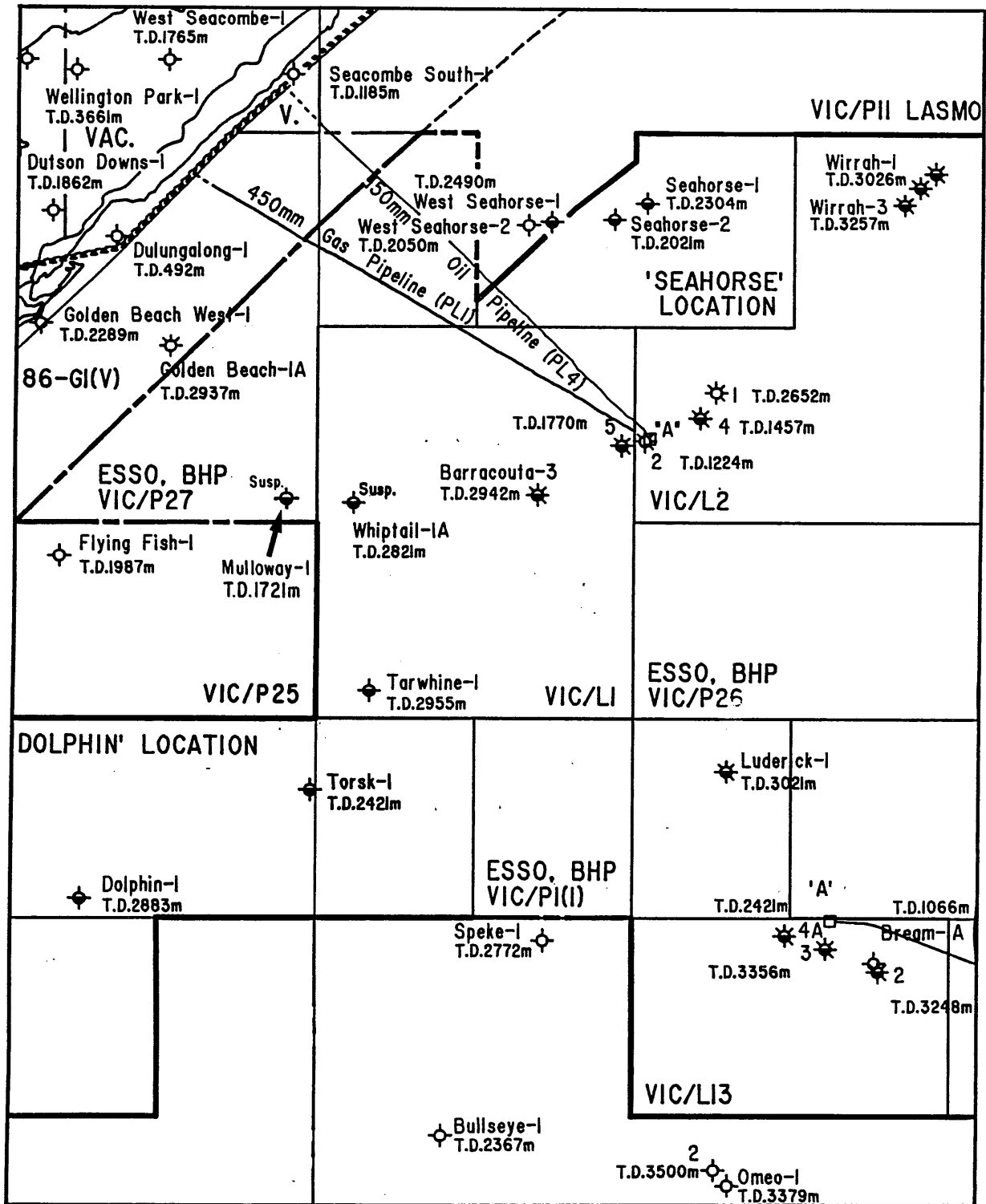
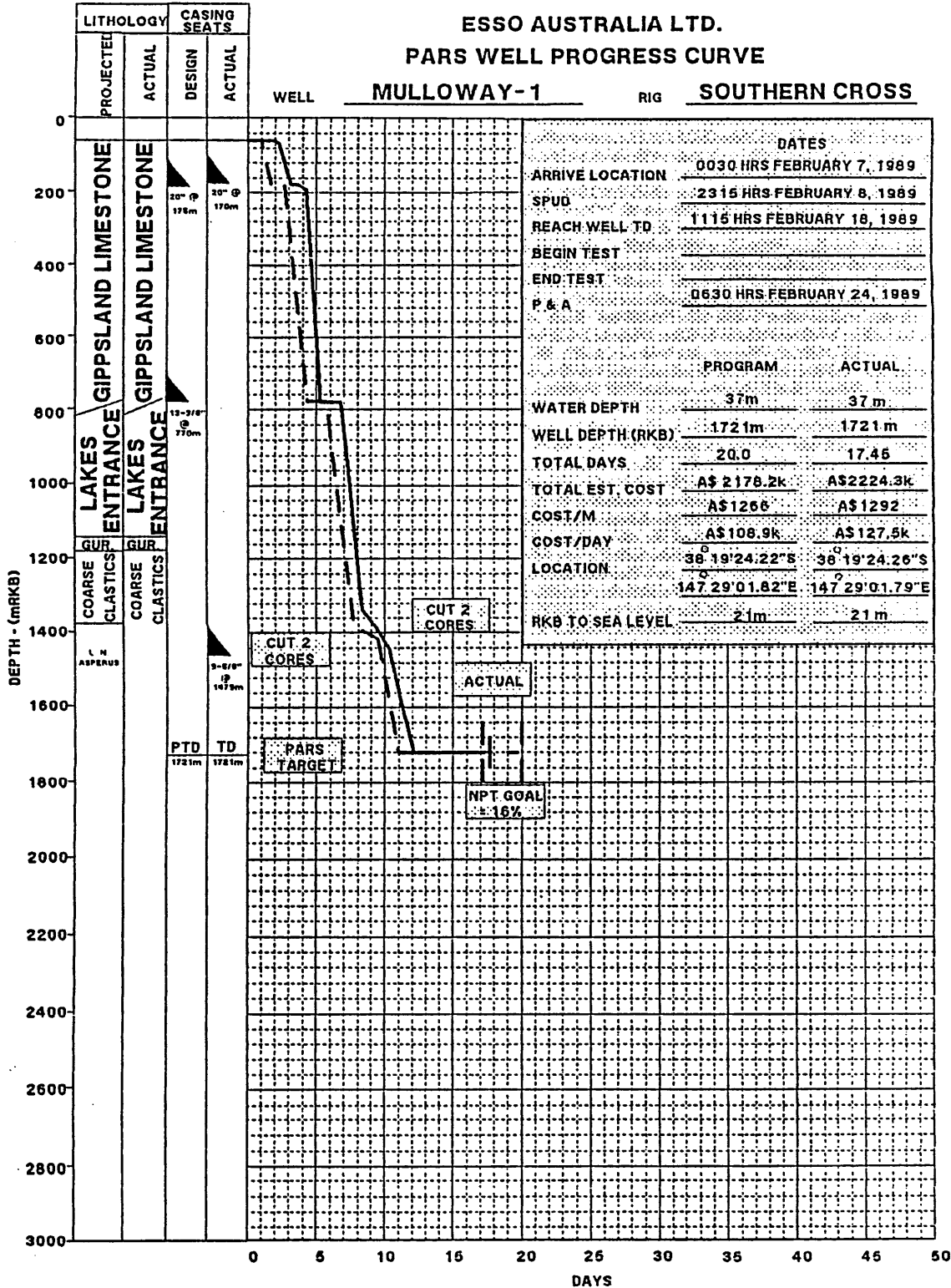


FIGURE 1

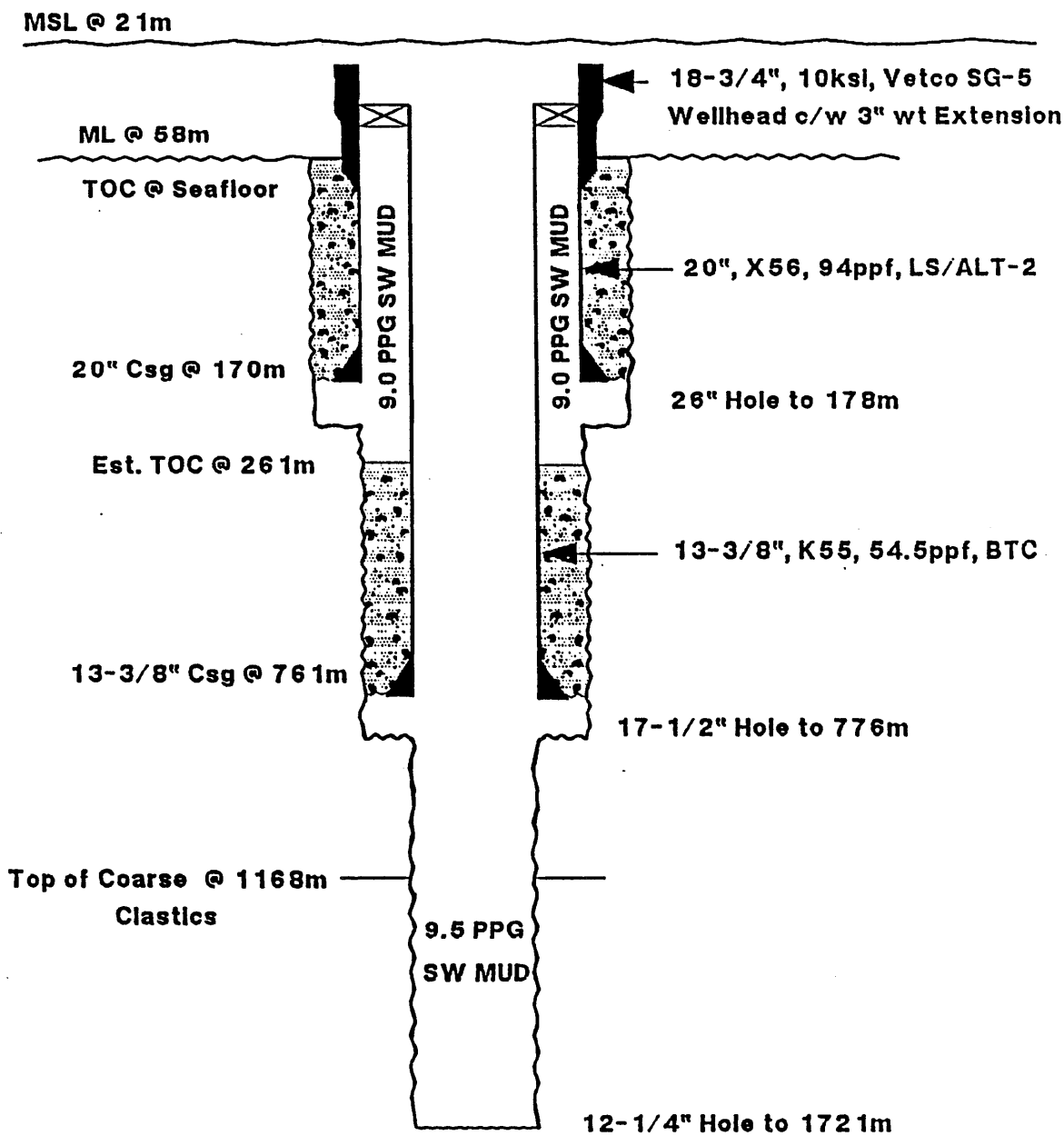
**ESSO AUSTRALIA LTD.
PARS WELL PROGRESS CURVE**

WELL MULLOWAY-1 RIG SOUTHERN CROSS



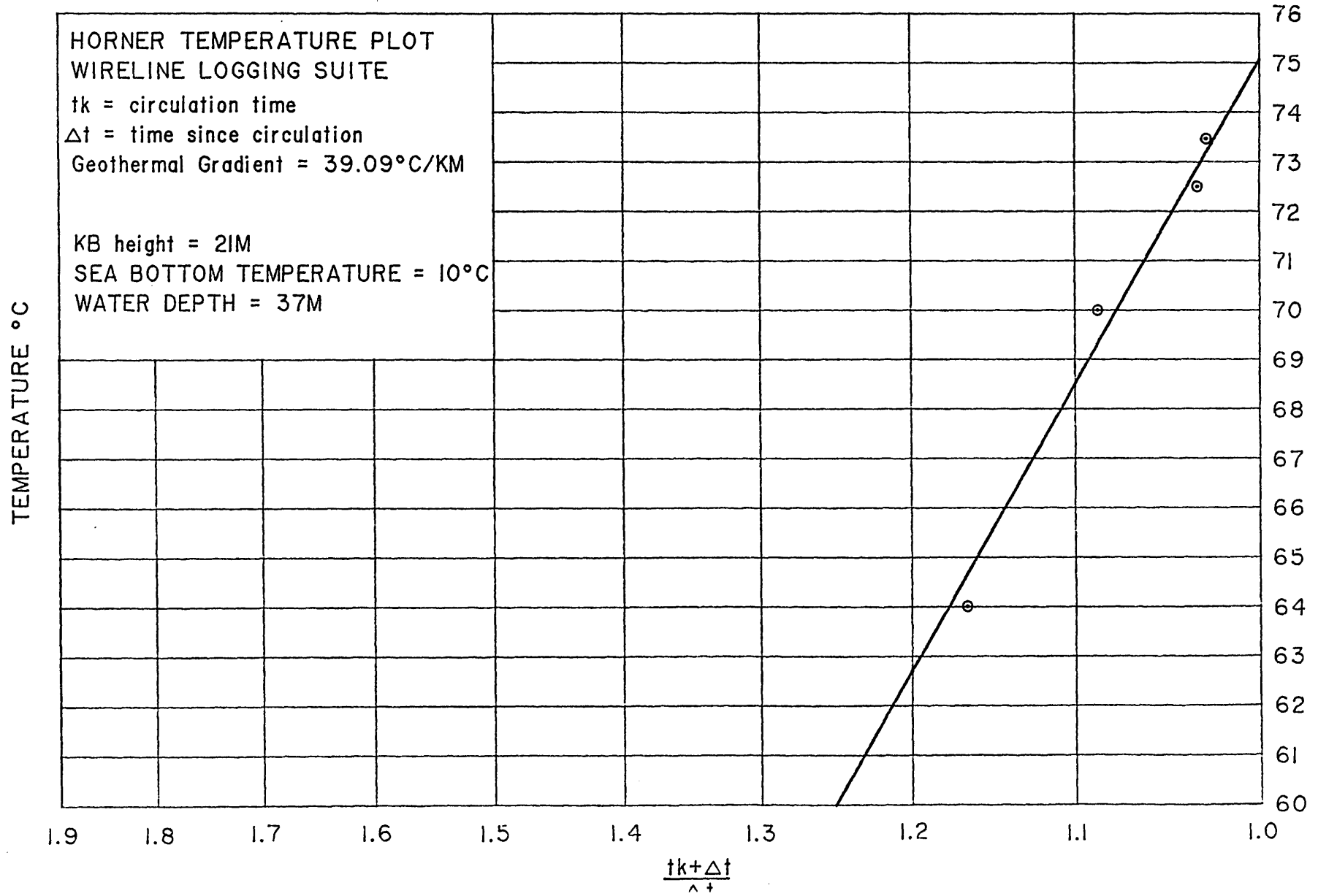
ESSO AUSTRALIA LTD. MULLOWAY-1 FINAL WELL REPORT WELLBORE SCHEMATIC

RKB



All depths are meters RKB

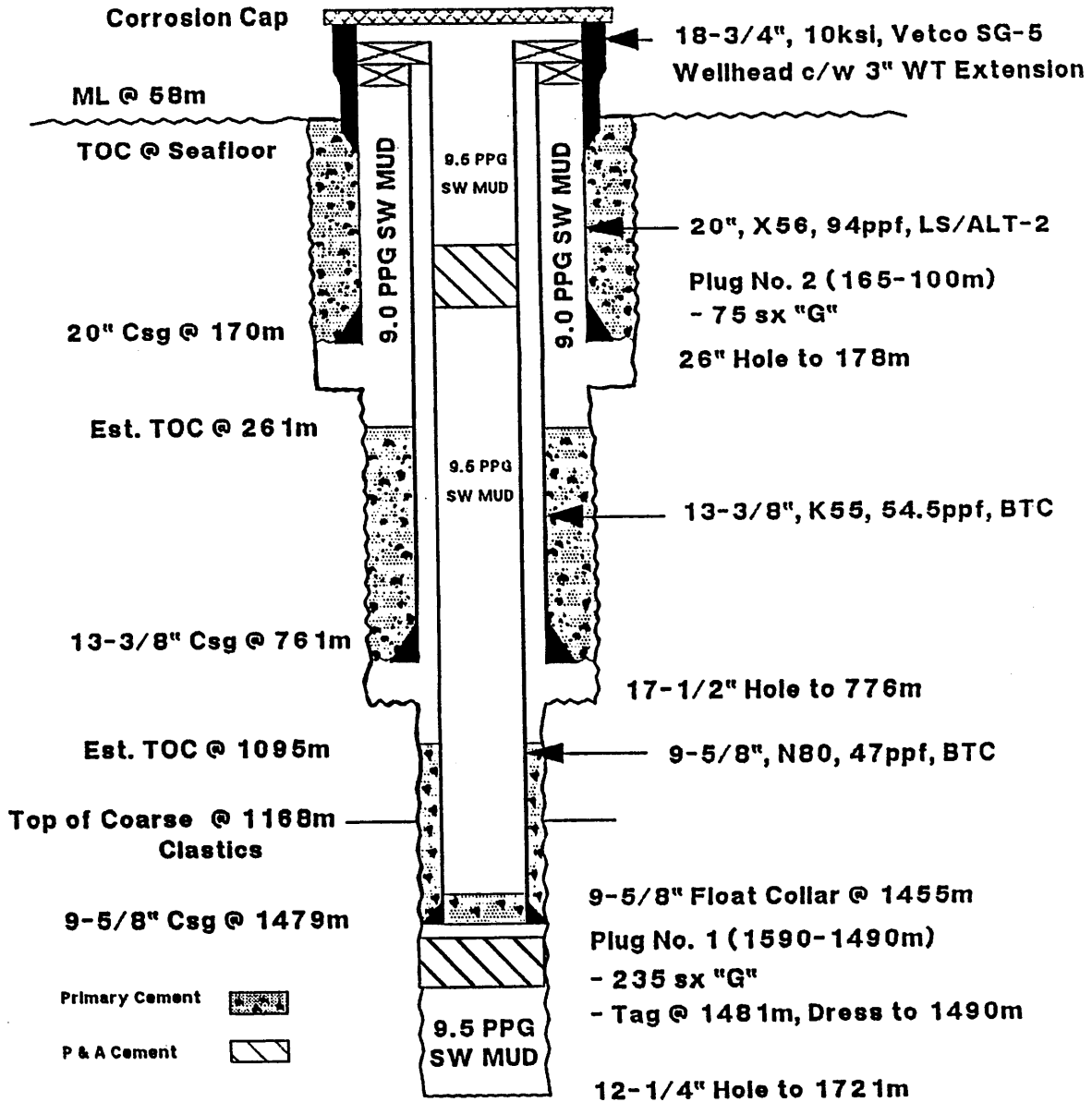
MULLOWAY-1



ESSO AUSTRALIA LTD. MULLOWAY-1 FINAL WELL REPORT TEMPORARY ABANDONMENT SCHEMATIC

RKB

MSL @ 21m



All depths are meters RKB

Lithology

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
780 - 810	100	LIMESTONE: Medium to light grey, calcisiltite to calcarenite = Wackestone, common calcareous foraminifera, trace to common pyrite, no visual porosity
810 - 840	100	LIMESTONE: As above, trace bryozoan fragments
840 - 870	100	LIMESTONE: As above
870 - 900	100	LIMESTONE: As above
900 - 930	100	LIMESTONE: As above
930 - 960	50 50	LIMESTONE: As above CLAYSTONE: Light grey, very calcareous (Marl) abundant foraminifera, trace pyrite, trace very fine to fine glauconite nodules, soft to firm, blocky.
960 - 990	30 70	LIMESTONE: As above CLAYSTONE: As above, light brown grey in parts.
990 - 1020	100 Tr	CLAYSTONE: As above with occasional nodular pyrite. LIMESTONE: As above
1020 - 1050	100 Tr	CLAYSTONE: As above, medium grey with white speckles (calcareous microfossils) LIMESTONE: As above
1050 - 1065	100 Tr	CLAYSTONE: As above, common fine to medium glauconite pellets LIMESTONE: As above
1065 - 1075	100	CLAYSTONE: As above, rare disseminated medium well rounded quartz grains.
1075 - 1080	100	CLAYSTONE: Light to medium grey, with white speckled calcareous microfossils, trace spherical foraminifera, trace glauconite, blocky, soft to firm.
1080 - 1090	100	CLAYSTONE: Light to medium grey, with white speckled microfossils, very calcareous, trace foraminifera, common spicules, common glauconite, blocky, soft to firm.
1090 - 1100	100	CLAYSTONE: As above, trace glauconite, trace quartz grains.
1100 - 1110	100	CLAYSTONE: As above, trace pale brown siltstone.
1110 - 1120	100	CLAYSTONE: As above, common light to pale brown siltstone, argillaceous, trace quartz grains, trace pyrite.
1120 - 1130	60 40	CLAYSTONE: As above, with glauconite (trace amount in claystone). SILTSTONE: Pale brown, argillaceous, trace pyrite, trace microfossils, trace glauconite, trace quartz grains, firm, blocky.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1130 - 1140	60	SILTSTONE: As above, common glauconite, trace pyrite, trace well rounded quartz grains.
	40	CLAYSTONE: As above.
1140 - 1150	50	SILTSTONE: As above, common glauconite, firm, trace foraminifera and platy micaceous flecks.
	50	CLAYSTONE: As above, common glauconite, firm.
1150 - 1160	60	SILTSTONE: As above, abundant glauconite, trace pyrite, firm to moderately hard.
	40	CLAYSTONE: As above.
1160 - 1165	80	SILTSTONE: As above, abundant glauconite, common disseminated quartz grains.
	20	CLAYSTONE: As above.
1165 - 1170	40	SILTSTONE: As above, abundant glauconite and trace of pyrite.
	40	CLAYSTONE: As above.
	20	SANDSTONE: White to clear, medium to very coarse, dominantly coarse grained, poorly sorted, angular to subrounded, weak siliceous cement, clean with no matrix, loose and friable, good inferred porosity, no fluorescence.
1170 - 1175	50	SANDSTONE: White, loose, medium to very coarse grained, very poorly sorted, subangular to subrounded, no fluorescence, very good inferred porosity.
	50	SILTSTONE: As above.
1175 - 1180	80	SANDSTONE: Off white, coarse to very coarse grained, moderately to poorly sorted, subangular to subrounded, loose and clean, trace muscovite mica, no pyrite, very good inferred porosity, no fluorescence.
	20	COAL: Black to dark brown, dull to subvitreous, grading to carbonaceous siltstone in parts, blocky to subfissile, moderately hard.
1180 - 1185	70	SANDSTONE: As above, common bit fractured shards, very good inferred porosity, no fluorescence.
	30	COAL: As above.
1185 - 1190	90	SANDSTONE: As above, ? trace oil staining, very good inferred porosity, no fluorescence.
	10	COAL: As above.
1190 - 1195	100	SANDSTONE: As above, trace pyrite, very minor trace bitumen stains, no fluorescence.
1195 - 1200	100	SANDSTONE: As above, poorly sorted, loose and clean, trace muscovite mica, no fluorescence.
1200 - 1205	100	SANDSTONE: As above, poorly sorted, very good inferred porosity, trace muscovite, no fluorescence.
1205 - 1210	80	SANDSTONE: As above, moderately to poorly sorted, trace of carbonaceous accretion on sandstone grains, no fluorescence.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1205 - 1210 (contd)	20 Tr	COAL: As above, black to dark brown, dull. SILTSTONE: Dark brown, carbonaceous to argillaceous, firm, blocky.
1210 - 1215	70 30	SANDSTONE: As above, poorly sorted, very good inferred porosity, no fluorescence. COAL: As above, black to dark brown, silty, blocky.
1215 - 1220	70 30	SANDSTONE: As above, poorly sorted, very good inferred porosity, no fluorescence. COAL: As above, dark brown to black, increasing siltstone content.
1220 - 1225	70 30	SANDSTONE: As above, trace pyrite cement on grains, very clean translucent grains, very minor trace fluorescence. COAL: As above, decreasing siltstone content.
1225 - 1230	90 10	SANDSTONE: As above, very poorly sorted, very good inferred porosity, very minor trace fluorescence. COAL: As above, becoming more bituminous with depth.
1230 - 1235	90 10	COAL: As above, dominantly dark brown to black, silty. SANDSTONE: As above, very clean to slightly frosted, very poorly sorted, very good inferred porosity, no fluorescence.
1235 - 1240	90 10	COAL: As above, dominantly dark brown silty, trace amber with bright yellow fluorescence, micro fractures with sideritic infill. SANDSTONE: As above, medium to very coarse, predominantly medium grained, very good inferred porosity, no fluorescence.
1240 - 1245	90 10	SANDSTONE: As above, occasionally fine grained, trace muscovite mica, very good visual porosity, no fluorescence. COAL: As above, grading to carbonaceous siltstone, common plant remains.
1245 - 1250		NO SAMPLE
1250 - 1255	95 5	SANDSTONE: As above, fine to coarse, predominantly medium grained, rare oil stained coarse grains, very good visual porosity, no fluorescence. COAL: As above (cavings).
1255 - 1260	95 5	SANDSTONE: As above, very good inferred porosity, no fluorescence. COAL: As above (cavings)
1260 - 1265	100	SANDSTONE: As above, fine to very coarse grained, common bit fractured shards, very good inferred porosity, no fluorescence.
1265 - 1270	100	SANDSTONE: As above, fine to very coarse grained, very good inferred porosity, trace very well rounded quartz grains, no fluorescence.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1270 - 1275	100 Tr	SANDSTONE: As above, trace pyrite, no fluorescence. COAL: As above (cavings).
1275 - 1280	100	SANDSTONE: Milky white, as above, grains predominantly translucent to transparent, fine to very coarse grained, very good inferred porosity, no fluorescence.
1280 - 1285	100	SANDSTONE: As above, fine to very coarse grained, very clean, no fluorescence.
1285 - 1290	100 Tr	SANDSTONE: As above, fine to very coarse grained, very clean, trace mica (muscovite) flakes, no fluorescence. COAL: Black, shiny, sub conchoidal fracture, brittle, moderately hard, trace laminae(<.5mm scale).
1290 - 1295	80 20	COAL: Dark brown to black, silty, sideritic infill of cleats, banding, moderately hard. SANDSTONE: As above, trace of grains showing good inclusions, no fluorescence.
1295 - 1300	100 Tr	SANDSTONE: As above, fine to very coarse grained, translucent to transparent grains, no fluorescence. COAL: As above.
1300 - 1305	100	SANDSTONE: As above, trace muscovite mica, fine to very coarse grained.
1305 - 1310	95 5	SANDSTONE: As above, fine to very coarse grained, trace muscovite mica, very good inferred porosity. COAL: As above, banded.
1310 - 1315	100	SANDSTONE: As above, trace muscovite mica, no fluorescence.
1315 - 1320	100	SANDSTONE: As above, trace pyrite cement coating grains.
1320 - 1325	90 10	SANDSTONE: As above, fine to very coarse grained, very good inferred porosity. COAL: As above, dark brown to black, silty.
1325 - 1330	100	SANDSTONE: As above, trace pyrite, no fluorescence.
1330 - 1335	100	SANDSTONE: As above, excellent inferred porosity, very clean, fine to very coarse grained, some yellow (oxidised) grains, no fluorescence.
1335 - 1340	100	SANDSTONE: As above, excellent inferred porosity, very clean, fine to very coarse grained, no fluorescence.
1340 - 1345	100 Tr	SANDSTONE: As above, fine to very coarse grained, excellent inferred porosity, very clean, no fluorescence. COAL: As above, dominantly black, occasionally dark brown, slightly silty.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1345 - 1350	100	SANDSTONE: White to off white, grains milky to transparent, very clean and loose, fine to very coarse grained, dominantly subangular, excellent inferred porosity, no fluorescence.
1350 - 1355	100	SANDSTONE: White to off white, grains milky to transparent, very clean and loose, fine to very coarse grained, subangular, trace calcareous cement, trace mica, very good inferred porosity, trace calcareous mineral fluorescence
1355 - 1360	100	SANDSTONE: As above, clean, trace calcareous cement, fine to very coarse grained, very good inferred porosity, trace fluorescence (associated with calcareous cement).
1360 - 1365	95	SANDSTONE: As above, clean, fine to very coarse grained, very good inferred porosity, trace mineral fluorescence.
	5	COAL: Dark brown to black, slightly silty.
1365 - 1370	50	SANDSTONE: As above, fine to very coarse grained, very good inferred porosity, very minor trace mineral fluorescence.
	50	SILTSTONE: Dark grey to brown, slightly carbonaceous, argillaceous, hard, blocky.
	Tr	COAL: As above, silty.
1370 - 1375	90	COAL: As above, dark brown to black, sub vitreous to dull, grades to carbonaceous siltstone, banded.
	10	SANDSTONE: As above, fine to very coarse grained, clean and loose, minor trace calcareous cement, good inferred porosity, no fluorescence (cavings).
1375 - 1380	60	SANDSTONE: Off white to cream, grains white to transparent, loose and clean, fine to very coarse grained, very poorly sorted, subangular, very good inferred porosity, trace fluorescence.
	30	COAL: Dark brown to black, waxy to dull, grades to carbonaceous siltstone, some silty grains in waxy fragments.
	10	SILTSTONE: Dark brown to grey, carbonaceous, argillaceous, hard, blocky.
1380 - 1393.5		Cut Core 1 (cut 13.5m recovered 8.5m, 62.2%)
1393.5 - 1405.5		Cut core 2 (cut 12m recovered 6.7m, 55.8%)
1405.5 - 1410	70	SANDSTONE: As above, excellent inferred porosity, no fluorescence, slight trace brown oil staining.
	30	SILTSTONE: Medium to dark brown, argillaceous/carbonaceous, waxy texture (?kerogen), grades to silty coal in parts, subfissile, moderately hard.
	Tr	CAVINGS: As above.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1410 - 1415	80	SANDSTONE: As above, common oil stained grains, excellent inferred porosity, no fluorescence.
	20	SILTSTONE: As above.
	Tr	COAL: As above.
	Tr	CAVINGS: As above.
1415 - 1420	60	SANDSTONE: As above, common oil stained grains, excellent inferred porosity, no fluorescence.
	40	SILTSTONE: As above.
	Tr	COAL: As above, possibly cavings.
	Tr	CAVINGS:
1420 - 1425	100	SANDSTONE: White to pale cream, grains translucent to transparent, loose and clean, coarse to very coarse grained, poor to moderately sorted, subangular to subrounded, no observable cement, very good inferred porosity, no fluorescence. (sample affected by 20% cavings)
1425 - 1430	90	SANDSTONE: White to pale cream, grains milky to translucent, loose and very clean, fine to very coarse grained, very poorly sorted, subangular, no observable cement or matrix, trace of pyrite accretion to quartz grains, excellent visual porosity, no fluorescence.
	10	COAL: Dark brown, waxy to dull, silty, trace disseminated pyrite.
1430 - 1435	60	COAL: Dark brown to black, waxy to dull, common silty, trace pyrite, sideritic cleat fill.
	40	SANDSTONE: As above, loose to very clean, subangular, fine to very coarse grained, no fluorescence.
1435 - 1440	95	SANDSTONE: Off white to very pale brown/cream, grains translucent to light brown/orange, coarse to very coarse grained, poorly sorted, subangular, loose and clean, excellent visual porosity, no fluorescence.
	5	COAL: As above, black to dark brown, waxy.
1440 - 1445	100	SANDSTONE: Off white to pale cream/brown, grains translucent to light brown/orange, coarse to very coarse grained, poorly sorted, subangular, loose and clean, (some Fe stained grains) excellent visual porosity, no fluorescence.
	Tr	COAL: As above.
1445 - 1450	100	SANDSTONE: As above, coarse to very coarse grained, some cloudy grey quartz grains, Fe stained grains, trace muscovite mica, no fluorescence.
	Tr	COAL: As above, trace silty.
1450 - 1455	100	SANDSTONE: As above, medium to very coarse grained, poorly sorted, loose and clean, trace milky quartz, trace pyrite and muscovite mica, no fluorescence.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1455 - 1460	95	SANDSTONE: As above, medium to very coarse grained, very poorly sorted, subangular, trace pyrite, no fluorescence.
	5	COAL: As above, black, waxy.
1460 - 1465	95	SANDSTONE: White to pale cream, grains white to transparent, loose and very clean, poorly sorted, subrounded, trace pyrite cement on quartz grains, trace Fe stained grains, excellent visual porosity, no fluorescence.
	5	COAL: Dark brown to black, waxy to dull, trace sideritic cleat fill, hard, blocky.
	Tr	SILTSTONE: Mid brown, argillaceous to micaceous, moderately hard, blocky.
1465 - 1470	95	SANDSTONE: As above, white to light cream, grains transparent to occasionally orange stained, loose and clean, very poorly sorted, subangular, trace pyrite (cavings?), excellent visual porosity, no fluorescence.
	5	COAL: As above, silty.
1470 - 1475	100	SANDSTONE: White to cream, clear to milky, medium to very coarse, predominantly coarse grained, moderately sorted, subangular to subrounded, loose and clean, common waxy oil stained grains, excellent inferred porosity, no fluorescence.
	Tr	COAL: As above.
1475 - 1480	95	SANDSTONE: As above, predominantly very coarse grained, excellent inferred porosity, common oil staining, no fluorescence.
	5	COAL: As above.
1480 - 1485	95	SANDSTONE: As above, trace pyrite, trace muscovite, excellent inferred porosity, no fluorescence.
	5	COAL: As above.
1485 - 1490	95	SANDSTONE: As above, excellent inferred porosity, no fluorescence.
	5	COAL: As above.
1490 - 1495	90	SANDSTONE: White to off white, grains white to transparent, loose and very clean, coarse to very coarse grained, poorly sorted, subangular, trace pyrite, excellent visual porosity, no fluorescence.
	10	COAL: Black to dark brown, waxy to dull, slightly silty, hard, blocky.
1495 - 1500	95	SANDSTONE: As above, trace pyrite, trace muscovite, excellent visual porosity, no fluorescence.
	5	COAL: As above.
	Tr	SILTSTONE: Brown to dark brown, argillaceous to carbonaceous, moderately hard, blocky.
1500 - 1505	95	SANDSTONE: As above, trace pyrite, excellent visual porosity, no fluorescence.
	5	COAL: As above.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1505 - 1510	100	SANDSTONE: As above, trace pyrite, trace muscovite (very coarse grains), excellent visual porosity, no fluorescence.
	Tr	COAL: As above.
	Tr	SILTSTONE: As above.
1510 - 1515		No Sample
1515 - 1520	100	SANDSTONE: As above, common pyrite, trace muscovite, excellent visual porosity, no fluorescence.
	Tr	SILTSTONE: As above.
1520 - 1525	100	SANDSTONE: As above, common pyrite, trace muscovite, excellent visual porosity, no fluorescence.
1525 - 1530	95	SANDSTONE: Off white, grains white to transparent, firm, loose and clean, coarse to very coarse grained, poorly sorted, subangular, common to abundant pyrite, good visual porosity, no fluorescence.
	5	COAL: As above.
1530 - 1535	95	SANDSTONE: As above, loose to firm, common to abundant pyrite (2 large 5mm accretion nodules), good inferred porosity, no fluorescence.
	5	SILTSTONE: Dark brown to mid brown, argillaceous to carbonaceous, moderately hard, blocky.
1535 - 1540	100	SANDSTONE: As above, common pyrite, excellent visual porosity, no fluorescence.
	Tr	SILTSTONE: Light grey to pale brown, argillaceous, weak siliceous cement, argillaceous matrix, moderately hard, blocky.
1540 - 1545	100	SANDSTONE: As above, trace pyrite, excellent inferred porosity, no fluorescence.
1545 - 1550	100	SANDSTONE: As above, excellent inferred porosity, no pyrite, no fluorescence.
	Tr	COAL: Black, waxy to dull, hard, blocky.
1550 - 1555	100	SANDSTONE: White, grains white to transparent, loose and very clean, medium to coarse grained, poorly sorted, subangular, no muscovite or pyrite, excellent inferred porosity, no fluorescence.
1555 - 1560	95	SANDSTONE: As above, loose to very clean, coarse to very coarse grained, very poorly sorted, subangular, excellent inferred porosity, no fluorescence.
	5	COAL: As above.
1560 - 1565	95	SANDSTONE: As above, coarse to very coarse grained, very poorly sorted, angular to subangular, excellent inferred porosity, no fluorescence.
	10	COAL: As above.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1565 - 1570	90	SANDSTONE: White to off white, grains milky to transparent, loose and clean, fine to coarse grained, poorly sorted, subangular to subrounded, trace pyrite (?cavings), very good inferred porosity, no fluorescence.
	5	SILTSTONE: Mid brown, argillaceous to carbonaceous, moderately hard, blocky, ?cavings?
	5	COAL: As above, ?cavings?
1570 - 1575	100	SANDSTONE: Off white, grains milky to transparent, loose and clean, fine to coarse grained, poorly sorted, angular to subangular, trace pyrite, very good visual porosity, no fluorescence.
1575 - 1580	100	SANDSTONE: Off white, grains milky to transparent, loose and clean, fine to very coarse grained, poorly sorted, subangular to subrounded, trace pyrite, trace muscovite, excellent inferred porosity, no fluorescence.
	Tr	COAL: Black to dark brown, waxy to dull, slightly silty, blocky, hard.
1580 - 1585	95	SANDSTONE: As above, fine to very coarse grained, very poorly sorted, angular to subangular, trace pyrite, excellent inferred porosity, no fluorescence.
	5	SILTSTONE: Mid brown to mid grey, siliceous cement and argillaceous matrix, carbonaceous bands, hard, blocky.
1585 - 1590	95	SANDSTONE: As above, excellent inferred porosity, no fluorescence.
	5	SILTSTONE: As above.
	Tr	COAL: As above.
1590 - 1595	100	SANDSTONE: As above, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above.
1595 - 1600	100	SANDSTONE: Off white, grains white to transparent, loose and clean, medium to very coarse grained, poorly sorted, angular to subangular, trace pyrite, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above.
1600 - 1605	100	SANDSTONE: As above, fine to very coarse grained, loose and clean, very poorly sorted, subangular, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above.
	Tr	COAL: As above.
1605 - 1610	100	SANDSTONE: As above, fine to very coarse grained, poorly sorted, subangular to subrounded, excellent inferred porosity, trace pyrite, trace muscovite, no fluorescence.
	Tr	SILTSTONE: As above.
	Tr	COAL: As above.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1610 - 1615	100	SANDSTONE: White to off white, grains milky to transparent, coarse to very coarse grained, predominantly bit fracture grains, moderately sorted, angular to subrounded, moderate to strong dolomitic cement, clean, trace pyrite and muscovite, very poor to fair porosity, 30% moderately bright yellow dolomitic mineral fluorescence.
1615 - 1620	100	SANDSTONE: As above, clean, fine to very coarse grained, poorly sorted, subangular to subrounded, moderate dolomitic cement, trace pyrite, poor porosity, 20% moderately bright yellow dolomitic mineral fluorescence.
1620 - 1625	100	SANDSTONE: As above, fine to very coarse grained, poorly sorted, subangular to subrounded, moderate dolomitic cement, poor porosity, 30% moderately bright yellow dolomitic mineral fluorescence.
1625 - 1630	100	SANDSTONE: As above, very poorly sorted, subangular to subrounded, moderate dolomitic cement, poor porosity, 30% moderately bright yellow dolomitic mineral fluorescence.
1630 - 1635	100	SANDSTONE: As above, very poorly sorted, subangular, moderate to weak dolomitic cement, poor to fair porosity, 10% moderately bright yellow dolomitic mineral fluorescence.
	Tr	SILTSTONE: Medium brown to medium grey, arenaceous with argillaceous matrix, firm to moderately hard, blocky.
1635 - 1640	95	SANDSTONE: As above, very poorly sorted, subangular, moderate to weak dolomitic cement, poor to fair porosity, 15% moderately bright yellow dolomitic mineral fluorescence.
	5	SILTSTONE: As above, arenaceous with argillaceous matrix.
	Tr	COAL: Dark brown black, dull, waxy, blocky, hard.
1640 - 1645	60	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, subangular, no observable dolomitic cement (->Tr), trace moderately bright yellow dolomitic mineral fluorescence (?cavings).
	40	COAL: Very dark brown to black, dull to subvitreous, waxy, blocky and angular, hard.
1645 - 1650	90	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, subangular, trace moderately bright yellow to yellow/orange mineral fluorescence.
	10	COAL: As above.
1650 - 1655	80	SANDSTONE: White to off white, grains white to transparent, loose and clean, coarse to very coarse grained, poorly sorted, subangular, trace pyrite, very good inferred porosity, no fluorescence.
	20	COAL: Very dark brown to black, dull to subvitreous, waxy, blocky and angular, hard.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1655 - 1660	60	SANDSTONE: As above, loose and clean, coarse to very coarse grained, poorly sorted, subangular, trace muscovite, trace Fe stained quartz grains, excellent inferred porosity no fluorescence.
	40	COAL: As above.
1660 - 1665	95	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, trace muscovite, trace Fe stained grains, excellent inferred porosity, no fluorescence.
	5	COAL: As above.
	Tr	SILTSTONE: Medium brown, arenaceous with argillaceous matrix, trace carbonaceous detritus, firm to moderately hard, blocky.
1665 - 1670	100	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above, light brown to medium brown, arenaceous with argillaceous matrix.
1670 - 1675	100	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, trace Fe stained grains, excellent inferred porosity, no fluorescence.
1675 - 1680	100	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, trace pyrite, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above.
1680 - 1685	100	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, trace pyrite, excellent inferred porosity, no fluorescence.
	Tr	SILTSTONE: As above.
1685 - 1690	95	SANDSTONE: As above, medium to very coarse grained, poorly sorted, trace pyrite and Fe staining, very good inferred porosity, no fluorescence.
	5	SILTSTONE: Light to medium grey/brown, arenaceous with argillaceous matrix, large arenaceous grains, vary from extremely fine to fine (coarse silt), trace carbonaceous material, soft to firm, blocky.
1690 - 1695	95	SANDSTONE: As above, trace pyrite and Fe staining, excellent inferred porosity, no fluorescence.
	5	SILTSTONE: As above, some coarse grains in medium to coarse siltstone, soft, blocky.
1695 - 1700	90	SANDSTONE: Off white to grey white, grains white to off white, loose and clean, medium to very coarse grained, poorly sorted, subangular, trace pyrite, excellent visual porosity, no fluorescence.
	10	SILTSTONE: Medium grey to brown, arenaceous with argillaceous matrix, trace carbonaceous detritus, firm, blocky.

MULLOWAY-1

<u>DEPTH</u>	<u>%</u>	<u>LITHOLOGY</u>
1700 - 1705	90	SANDSTONE: As above, medium to very coarse predominantly very coarse grained, poorly to moderately sorted, subangular, trace pyrite and muscovite, very good visual porosity, no fluorescence.
	10	SILTSTONE: As above, trace of some larger carbonaceous fragments.
1705 - 1710	90	SANDSTONE: As above, medium to very coarse grained, poorly sorted, subangular, very good visual porosity, no fluorescence.
	10	SILTSTONE: As above, trace of coarse quartz and carbonaceous fragments.
1710 - 1715	100	SANDSTONE: As above, coarse to very coarse grained, poorly sorted, subangular, excellent inferred porosity, no fluorescence.
1715 - 1721	100	SANDSTONE: As above.
	Tr	SILTSTONE: As above.

Stratigraphy

Core No. 1

Well : Mulloway-1

Interval Cored : 1380m - 1393.5m

Cut : 13.5m

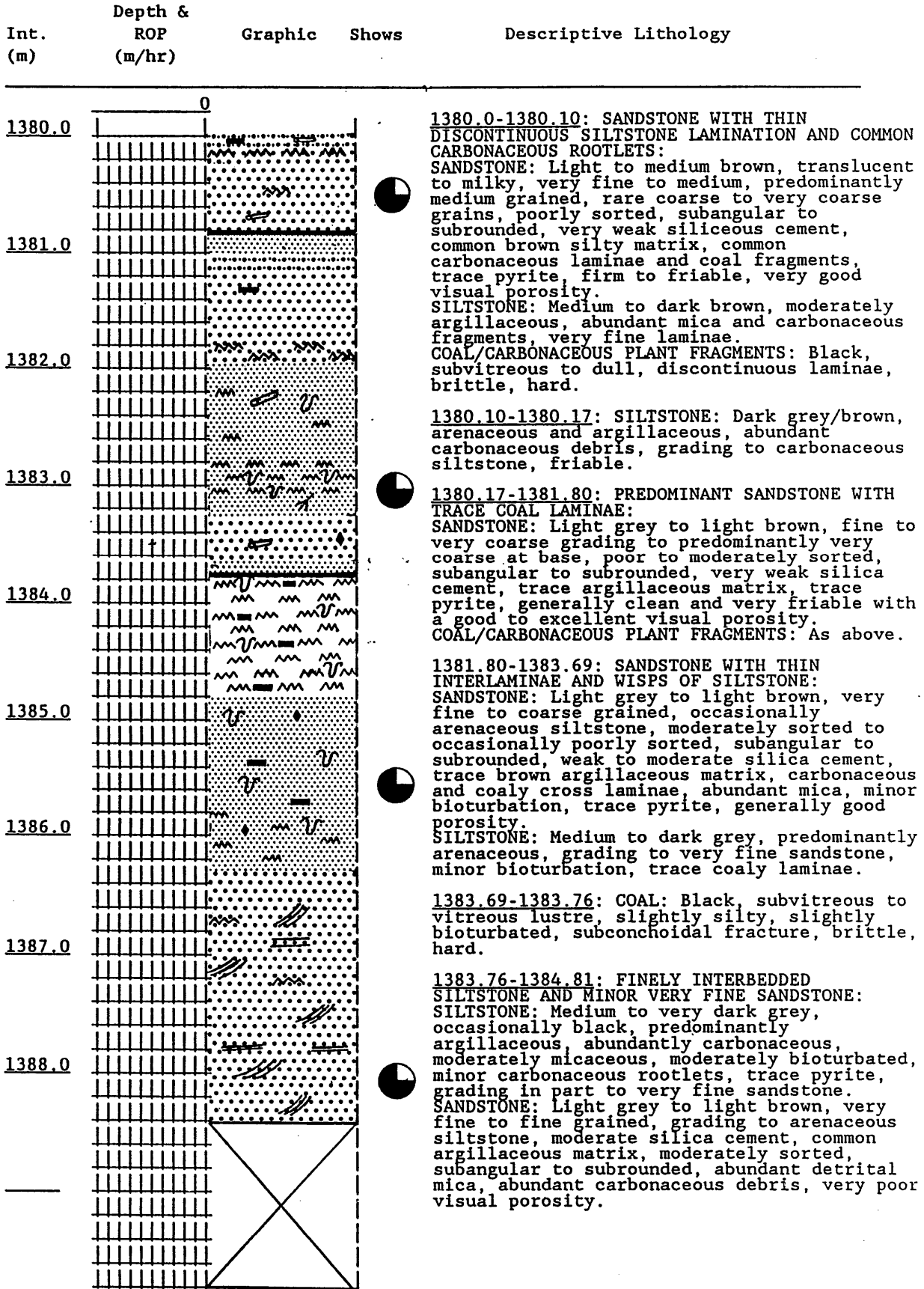
Bit Type : ZC 478

Described by : G. Smith
A. Clare

Recovered : 8.4m (62%)

Bit Size : 12 1/4" x 5 1/4"

Date : 16/2/89



Core No. 1

Well : Malloway-1

Interval Cored : 1380m - 1393.5m

Cut : 13.5m

Bit Type : ZC 478

Described by : G. Smith
A. Clare

Recovered : 8.4m (62%)

Bit Size : 12 1/4" x 5 1/4"

Date : 16/2/89

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
	0		
			1384.81-1386.38: SUBHORIZONTALLY BEDDED SANDSTONE WITH THIN CONTINUOUS AND DISCONTINUOUS SILTSTONE AND CARBONACEOUS LAMINAE: SANDSTONE: Light grey to light brown, fine to medium, grading in part to siltstone, moderately sorted, subangular to subrounded, moderate silica cement, trace argillaceous matrix, abundant disseminated mica, moderately bioturbated, trace pyrite. SILTSTONE: As above. COAL/CARBONACEOUS SILTSTONE: As above.
			1386.38-1388.38: MASSIVE CROSSBEDDED SANDSTONE: SANDSTONE: Very light grey to light brown, medium to very coarse grained, predominantly very coarse to coarse, poor to moderately sorted, subangular to subrounded, trace silica cement, trace argillaceous matrix, generally clean and friable, very good to excellent visual porosity.
			1380.0-1388.38: FLUORESCENCE: Sandstones have 100% moderately bright to bright even yellow to white fluorescence, instant blooming to moderate streaming cut, thick film residue, minor oil staining on some grains, core exhibited a strong hydrocarbon odour.

Core No. 2

Well : Malloway-1

Interval Cored : 1393.5 - 1405.5

Cut : 12m

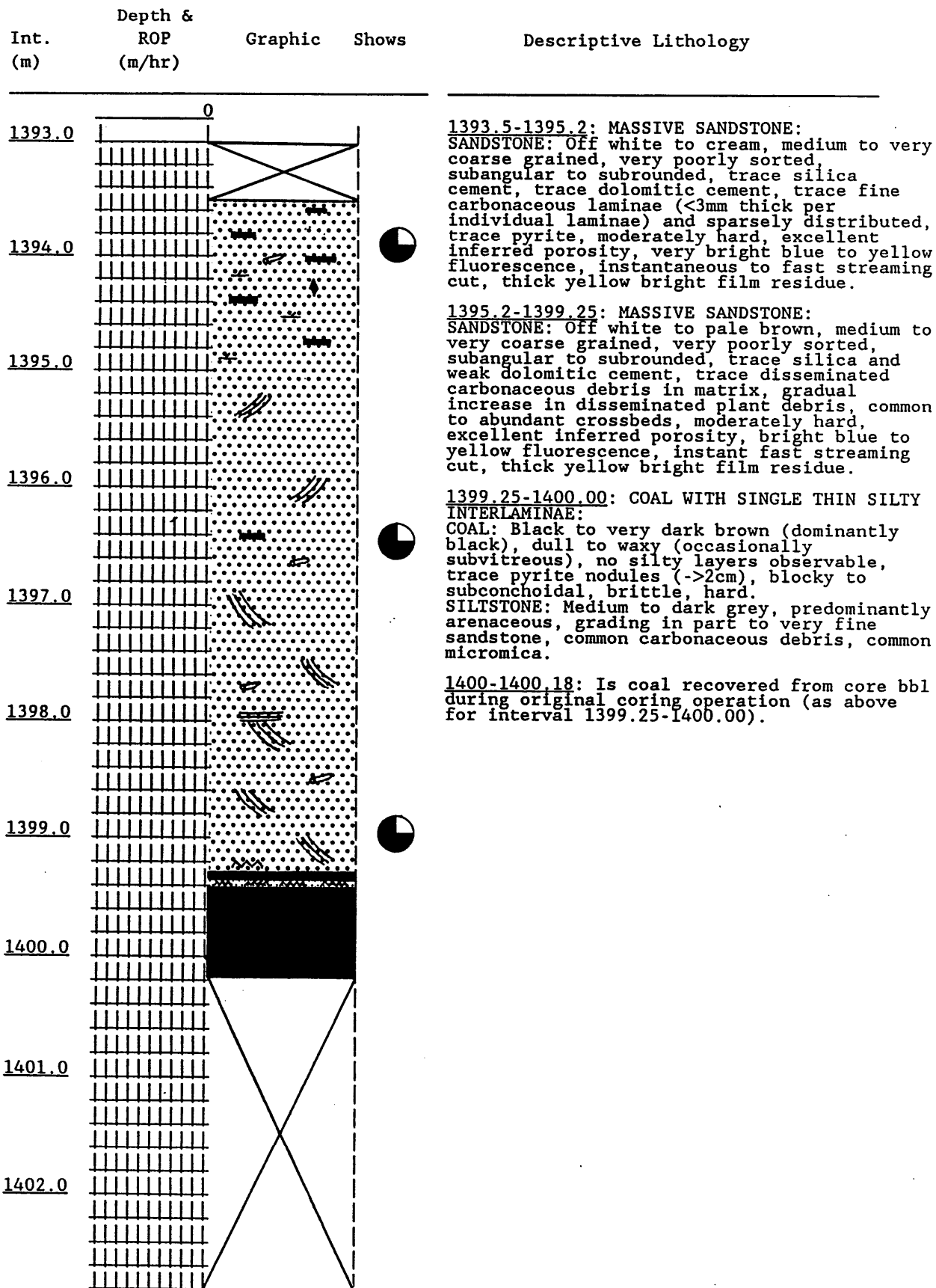
Bit Type :

Described by : G. Smith
A. Clare

Recovered : 6.7m (55.8%)

Bit Size : 12 1/4"

Date : 10/3/89



Sidewall Core Descriptions

MULLOWAY-1

SIDEWALL CORE DESCRIPTIONS

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
1	1696.5	15	B	SILTSTONE: Medium brown, arenaceous with swelling argillaceous matrix, homogeneous, abundant micromica, trace carbonaceous flecks, non calcareous, blocky, soft to firm. GAS: 215/56/35/19/- *
2	1671.3	15	B	CLAYSTONE: Medium brown, slightly silty, micromicaceous, homogeneous, non swelling, disseminated framboidal pyrite nodules, trace carbonaceous flecks, amorphous to blocky, soft. GAS: 86/45/35/10
3	1651.6	25	B	SILTSTONE: Off white, arenaceous, grading to very fine sandstone, white, moderately swelling (cryptoturgid) argillaceous matrix, homogeneous, trace pyrite nodules, non calcareous, sucrosic to blocky, firm, no fluorescence. GAS: 51/17/9/3
4	1634.6	20	B	SILTSTONE: As above, slightly swelling argillaceous matrix, soft to firm, no fluorescence. GAS: 77/34/15/4
5	1603.1	15	B	SILTSTONE: As above, trace carbonaceous flecks, microlaminae parallel to core axis, slightly swelling, soft to firm, no fluorescence. GAS: 64/11/2
6	1580.7	35	B	CLAYSTONE: Light grey, homogeneous, slight trace micromica, non swelling, plastic, amorphous to blocky, soft to firm. GAS: 155/23/11
7	1565.0	30	B	CLAYSTONE: Light to medium brown, homogeneous, slight trace micromica, non pyritic, non swelling, blocky, soft to firm. GAS: 215/39/13/Tr
8	1557.1	20	B	CLAYSTONE: Cream to black, very pyritic, large pyrite nodules (approx 70% of core), micromicaceous, slightly silty, rare carbonaceous flecks, amorphous, soft. GAS: 103/22/9/Tr
9	1524.0	35	B	SANDSTONE: Light grey to light brown, clear to translucent, medium to very coarse grained, moderately sorted, subangular to subrounded, weak silica cement, light brown argillaceous matrix (?mud infiltration) trace pyrite, friable, excellent visual porosity, (bullet impact enhanced) no fluorescence. GAS: 189/47/19/3

* Gas recorded as ppm C1/C2/C3/C4/C5

02890128/1-4

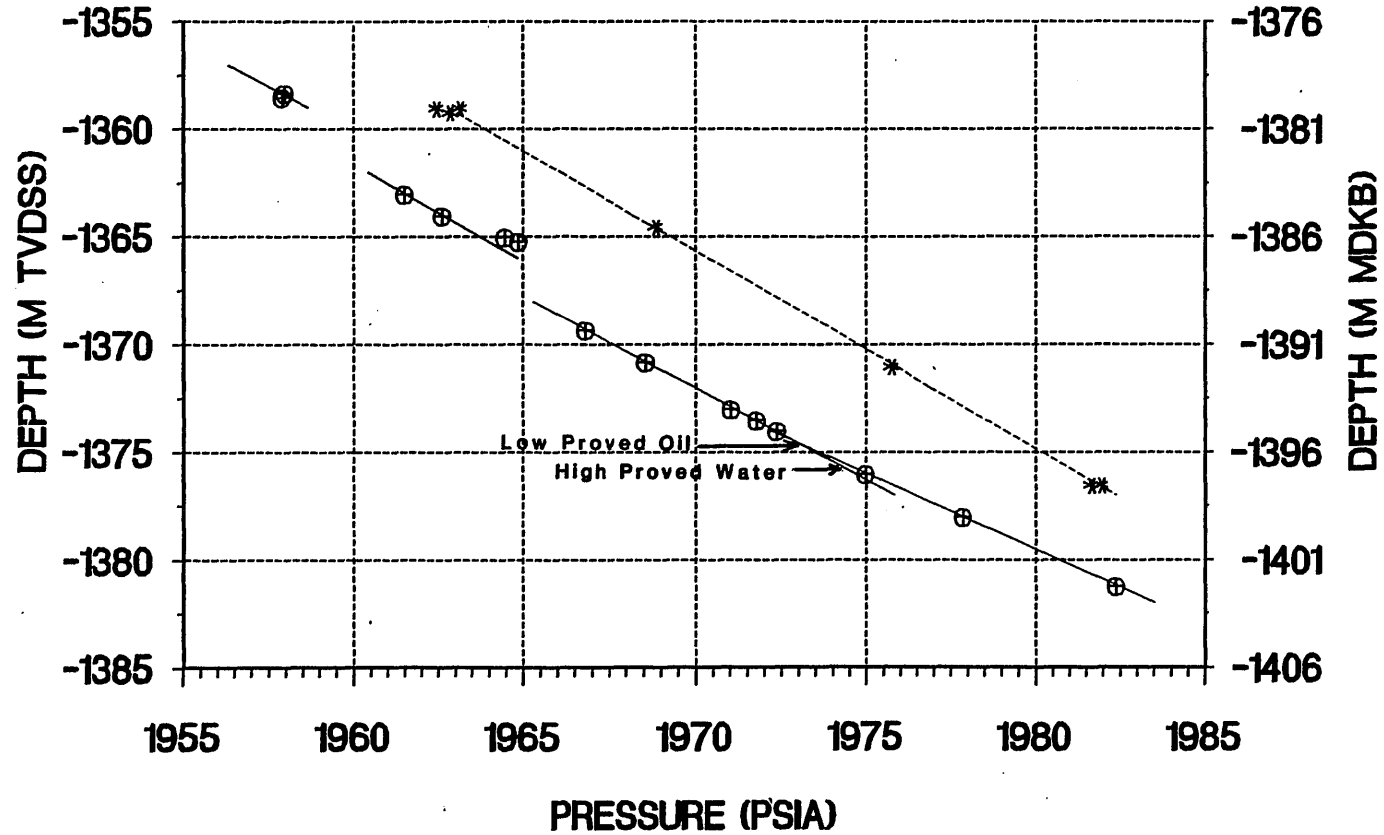
<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
10	1496.6	25	B	CLAYSTONE: Light to medium brown, homogeneous with single, concave (?down) carbonaceous lamina (0.3mm) parallel to core axis, micromicaceous, non calcareous, non swelling, blocky, firm. GAS: 552/101/18
11	1484.1	20	B	SILTSTONE: Light brown to cream, arenaceous, homogeneous, micromicaceous, slightly swelling argillaceous matrix, blocky to sucrosic, firm, no visible fluorescence, weak to moderate, pale green/yellow crush cut, thin ring residue. GAS: TR/TR
12	1439.3	40	B	CLAYSTONE: Medium red/brown, homogeneous, micromicaceous, silty, non calcareous, non swelling, blocky, firm to moderately hard. GAS: 483/51/4
13	1415.5	30	B	SILTSTONE: Cream to light brown, arenaceous with common carbonaceous microlaminae (?leaf detritus) parallel to to core axis, micromicaceous, non calcareous, moderately swelling argillaceous matrix, sucrosic to blocky, soft to firm, no visible fluorescence, weak, pale yellow, crush cut, thin ring residue. GAS: 232/45/5/5/2
14	1369.5	30	B	SILTSTONE: As above, medium brown carbonaceous laminae parallel to to core axis, grades to very fine sandstone, moderately swelling argillaceous matrix, micromicaceous, sucrosic to blocky, friable to firm, no visible fluorescence, weak pale yellow/green crush cut, thin ring residue. GAS: 293/34/9/3
15	1348.3	40	B	SANDSTONE: Light brown, clear to translucent, very fine to fine, predominantly very fine grained, grades to arenaceous siltstone, moderate to well sorted, subangular to subrounded, weak silica cement, moderately swelling argillaceous matrix, wavy carbonaceous microlaminae, trace micromica, friable to firm, fair visual porosity, no fluorescence, no cut. GAS: 181/25/9/6
16	1320.9	45	B	SANDSTONE: Cream to buff, clear to brown (oil stained), very fine to medium with disseminated coarse grains, very poorly sorted, angular to subrounded, weak silica cement, abundant brown oil stained argillaceous matrix, interlaminated brown (kerogenous?) claystone (0.2 to 0.8mm parallel to to core axis), common micromica, non calcareous, friable, very poor visual porosity, no visible fluorescence, weak, very pale green/yellow, crush cut. GAS: 826/84/14/11/1

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
17	1295.0	35	B	SILTSTONE: Dark grey/brown to medium grey, clear to brown stained, very fine to fine grained, moderate to well sorted, subrounded, weak silica cement, carbonaceous/argillaceous matrix, fine carbonaceous/argillaceous laminations, common micromica, non calcareous, firm, very poor visual porosity, no visible fluorescence, very weak, pale yellow, crush cut, thin film residue. GAS: 466/40/4/Tr/-
18	1285.3	30	B	SANDSTONE: Light grey to buff, clear to cream, very fine to medium grained, grades to arenaceous siltstone, moderately sorted, subangular to subrounded, weak silica cement, swelling argillaceous matrix, trace micromica, firm to moderately hard, fair to poor visual porosity, no visible fluorescence, no cut. GAS: 90/20/7/Tr/-
19	1271.8	25	B	SANDSTONE: Light grey to brown, clear to off white, fine to very fine grained, poorly sorted, subangular, weak silica cement, swelling argillaceous matrix, trace carbonaceous flecks and micromica, firm, poor visual porosity, no fluorescence, very weak, pale yellow, crush cut, thin film residue. GAS: 52/17/Tr/-/-
20	1259.0	30	B	SILTSTONE: Light grey to buff, silica cement, arenaceous with swelling argillaceous matrix, homogeneous, no carbonaceous matter or micromica, soft to firm, very poor visual porosity, no fluorescence, no cut. GAS: 39/Tr/-/-/-
21	1252.2	45	B	SANDSTONE: Medium to dark brown, clear to brown stained, fine to coarse, poorly sorted, angular to subangular, very strongly swelling (cryptofissile) argillaceous matrix, homogeneous, soft to friable, fair to good visual porosity, no visible fluorescence, very weak crush cut, thin film residue. GAS: 39/4
22	1233.0	25	B	SILTSTONE: Medium grey to grey/brown, arenaceous with moderately swelling argillaceous matrix, common micromica, firm, blocky, no fluorescence or cut. GAS: 29/4/-/-/-
23	1222.4	20	B	SILTSTONE: Light grey to cream/grey, arenaceous to lutaceous with trace argillaceous matrix, trace micromica, weak silica cement, firm, blocky, no fluorescence or cut. GAS: 17/-/-/-/-
24	1180.5	35	B	SILTSTONE: Medium grey to brown, arenaceous to lutaceous with strongly swelling (cryptoturgid) argillaceous matrix, trace micromica and minor interlaminae (parallel to to core axis, 2mm max) of very fine sandstone, weak silica cement, firm, blocky, no fluorescence, weak crush cut, thin, yellow film residue. GAS: 17/5/-/-/-

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
25	1176.0	35	B	SILTSTONE: Light grey to buff, arenaceous with minor swelling argillaceous matrix, trace micromica and single carbonaceous lamina (parallel to to core axis, 1mm) trace pyrite (in lamina), firm, blocky, no fluorescence, very weak, yellow, crush cut, thin yellow film residue. GAS: 22/4/-/-/-
26	1172.6	40	B	SANDSTONE: Medium grey/brown to buff, clear to grey, fine to very fine grained, well sorted, subangular to subrounded, trace swelling argillaceous matrix, trace coarse arenaceous grains and trace to common glauconite, diffuse laminae (< 3mm) parallel to core axis, firm, very poor visual porosity, no fluorescence, no cut, GAS: 22/4/-/-/-
27	1167.5	45	B	SILTSTONE: Dark grey to black, weakly swelling argillaceous matrix, common to abundant glauconite nodules and trace of coarse quartz grains (> 1mm), firm, blocky, no fluorescence, no cut. GAS: 103/36/26/71/25
28	1159.0	0		- Lost bullet, retaining wire broken.
29	1149.0	50	B	CLAYSTONE: Medium to dark grey/brown, strongly swelling, calcareous cement, abundant glauconite nodules, calcareous accretions, trace pyrite, ?calcareous/pyrite burrow infill, firm to moderately hard, blocky, no fluorescence, no cut. GAS: 86/90/114/84/41
30	1137.0	50	B	CLAYSTONE: Dark grey/brown, moderate to weakly swelling, calcareous with minor silica, calcareous cement, common glauconite, trace calcareous accretions, trace pyrite as burrow infill, firm to moderately hard, blocky, no fluorescence, no cut, no residue. GAS: 862/315/321/56/20

RFT Data

EXHIBIT 4: MULLOWAY-1 RFT DATA



⊕ ⊕ ⊕ RFT: MULLOWAY
 - - - - - WHIPTAIL
 ——— 1367.8-1375.0

* * * RFT: WHIPTAIL
 ——— 1357.5-1359.0

——— WATER GRADIENT
 ——— 1362.6-1366.0

MULLOWAY-1 RFT PRETEST PRESSURE DATA

Date: 19/2/89

Engineers: Ian Palmer and David Braisted

Tool: RFT-B

Quartz Gauge: HP-C

RFT No.	Depth m MDKB	Depth m TVDSS	Initial Hydrostatic Pressure		Time Set	Minimum Flowing Pressure (psig)	Minimum Formation Pressure		Temp. (deg F)	Time Retract	Final Hydrostatic Pressure		Comments.....
			HP (psia)	RFT (psig)			HP (psia)	RFT (psig)			HP (psia)	RFT (psig)	
1-1	1184.5	1163.5	1941.6	1932.2	1:56	6				2:01	1941.6		Tight
1-1A	1185.0	1164.0	1942.6	1930.5	2:05	1600	1676.60	1666.1	138.7	2:09	1942.9	1930.6	
1-2	1355.0	1334.0	2221.0	2208.1	2:25	1900	1915.50	1904.4	141.0	2:29	2221.1	2208.1	
1-3	1373.2	1352.2	2250.8	2238.0	2:36	1890	1941.86	1931.2	143.6	2:41	2250.7	2238.1	
1-4	1379.3	1358.3	2260.7	2247.7	2:46	535	1958.01	1945.3	144.4	2:50	2260.9	2247.9	
1-5	1379.5	1358.5	2261.1	2248.0	2:57	1526	1957.94	1946.5	145.0	3:01	2261.4	2248.1	
1-6	1384.0	1363.0	2268.9	2255.5	3:09	1470	1961.54	1950.4	145.4	3:14	2268.9	2255.6	
1-7	1385.0	1364.0	2270.7	2257.4	3:21	1908	1962.65	1951.6	145.7	3:24	2271.1	2257.6	
1-8	1386.2	1365.2	2272.8	2259.6	3:29	433	1964.91	1952.2	146.2	3:37	2272.9	2259.6	Suspect Supercharged
1-8A	1386.0	1365.0	2272.5	2259.1	3:45	1485	1964.51	1952.8	146.5	3:50	2272.4	2258.8	Suspect Supercharged
1-9	1390.3	1369.3	2279.6	2266.2	3:57	1507	1966.86	1955.1	146.7	4:02	2279.6	2266.0	
1-10	1391.8	1370.8	2282.0	2268.6	4:09	1951	1968.60	1957.5	147.0	4:13	2282.1	2268.5	
1-11	1394.0	1373.0	2285.5	2271.9	4:19	1955	1971.08	1959.9	147.2	4:24	2285.8	2272.2	
1-12	1395.0	1374.0	2287.5	2273.9	4:30	1470	1972.41	1960.7	147.4	4:35	2287.5	2273.9	
1-13	1397.0	1376.0	2290.8	2277.3	4:39	1902	1975.03	1963.7	147.7	4:44	2290.8	2277.3	
1-14	1399.0	1378.0	2294.2	2280.8	4:50	1833	1977.91	1966.6	148.1	4:54	2294.3	2280.7	
1-15	1402.2	1381.2	2299.4	2285.9	5:00	1881	1982.42	1971.1	148.3	5:05	2299.5	2285.8	
1-16	1412.0	1391.0	2315.4	2301.8	5:07	600							Lost Seal
1-16A	1410.0	1389.0	2312.2	2298.6	5:19	683	1995.88	1983.2	148.9	5:24	2312.2	2298.6	
1-17	1423.0	1402.0	2333.2	2319.7	5:30	1991	2014.42	2002.9	149.3	5:40	2333.7	2320.0	
1-18	1682.0	1661.0	2755.4	2741.3	5:52	2352	2385.92	2373.6	152.8	6:00	2755.4	2740.6	
1-19	1394.5	1373.5	2287.2	2274.6	6:16	1958	1971.82	1961.8	153.1	6:22	2287.6	2275.1	

Exhibit 1: Mulloway-1 Pretest RFT Pressure Survey

MULLOWAY-1 RFT SUBSURFACE FLUID SAMPLE DATA

Date: 19/2/89

Engineers: Ian Palmer and David Braisted

Tool: RFT-B

Quartz Gauge: HP-C

RFT No.	Depth m MDKB	Depth m TVDSS	Initial Hydrostatic Pressure			Minimum Flowing Formation Pressure			Temp. (deg F)	Sample Recovery			Formation Water (liters)	Mud Filtrate (liters)	Comments.....
			HP (psia)	RFT (psig)	Pressure (psig)	HP (psia)	RFT (psig)	Chamber (gal)		Oil (liters)	Gas (m3)				
2-20	1395.0	1374.0	2289.2		1333			142.2	---	---	---	---	---		Seal Failure
2-20A	1394.9	1373.9	2289.2	2276.1	1858	1972.93	1962.4	146.9	6.0	20.5	neg.	0.0	0.5		opened on rig floor preserved
									1.0						
3-21	1379.5	1358.5	2262.8	2249.8				144.7	---	---	---	---	---		"Overspeed" Abort
3-21A	1379.5	1358.5	2262.7	2249.8	1571	1958.39	1947.4	146.6	6.0	4.3	neg.	0.0	17.0		opened on rig floor
									2.8	---	---	---	---		Seal Failure
4-22	1395.9	1374.9	2287.4	2274.5				146.2	---	---	---	---	---		"Overspeed" Abort
4-22A	1395.9	1374.9	2287.4	2274.2				147.6	---	---	---	---	---		Seal Failure
4-22B	1395.8	1374.8	2286.8	2273.6	1942	1972.68	1961.6	150.1	6.0	19.5	neg.	1.6	---		opened on rig floor preserved
									1.0						
5-23	1396.8	1375.8	2288.5	2276.4	1945	1975.04	1964.1	147.7	6.0	0.0	neg.	22.0	---		formation water
									1.0	0.0	neg.	4.0	---		opened on rig floor

Note: all 6 gal. samples and the non-preserved 1 gal. sample were sent to the Core Store

Exhibit 2: Mulloway-1 RFT Sample Run Fluid Recovery Data

WELL : MULLOWAY # 1

RFT SAMPLE TEST REPORT

OBSERVER : IAN PALMER
DAVE BRAISTED

DATE : 19/2/89

RUN NO. 2

	CHAMBER 1 (6 GAL	CHAMBER 2 (1 GAL
SEAT NO.	2-20A	2-20A
DEPTH	1394.9 m MDKB	1394.9 m MDKB
A. RECORDING TIMES		
Tool Set	08:53	
Pretest Open		
Time Open		
Chamber Open	09:00	09:15
Chamber Full	09:06	09:17
Fill Time	6 MIN	2 MIN
Start Build up		
Finish Build up	09:08	09:19
Build Up time	1-2 MIN	1-2 MIN
Seal Chamber	09:11	09:20
Tool Retract		09:30
Total Time		37 MIN
B. SAMPLE PRESSURES HP		
IHP (PSIA)	2289.2 psia	1959.7 psia
ISIP	1972.93	1958.6
Initial Flowing Press.	1908	1959.7
Final Flowing Press.	1906	1958.6
Sampling Press. Range	2 PSI	1 PSI
FSIP	1972.58	1972.53
FHP		2288.3
Form.Press.(Horner)		
C. TEMPERATURE		
Depth Tool Reached		
Max.Rec.Temp.	149.7 OF	149.9 OF
Time Circ. Stopped	12:30 18/2/89 hrs.	
Time since Circ.	21 hrs.	
Form.Temp.(Horner)		
D. SAMPLE RECOVERY		
Surface Pressure	50 + psig	PRESERVED psig
Amt Gas	NEG lit.	UNOPENED lit.
Amt oil	20.5 lit.	
Amt Water	0.5 lit.	
Amt Others	FOAM OF MUD EMULSION lit.	
E. SAMPLE PROPERTIES		
Gas Composition		
C1	38 %	ppm
C2	.7 %	ppm
C3	.044 %	ppm
IC4/nC4	.048 %	ppm
C5	.001 %	ppm
C6+	NEG %	ppm
CO2/H2S	5/1 %	ppm
Oil Properties	30.9 API @ 60 ° F	API @ ° C
Colour	BRONZEY GREENY	
Fluorescence		
GOR		
Water Properties		
Resistivity	@ ° C	@ ° C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
Tritium(DPM)	2136 DPM *	ppm
Est.Water Type	FILTRATE	
Mud Properties		
Resistivity	@ ° C	@ ° C
NaCl Equivalent	ppm	ppm
Cl- titrated	ppm	ppm
Calibration		
Calibration Press.	psig	psig
Calibration Temp.	° C	° C
Hewlett Packard No.		
Mud Weight		
Calc.Hydrostatic		
RFT Chokesize	.04"	.02"
REMARKS	* DRILLING 3100 INCLUDE CHAMBER NUMBERS	RFS - AD 1122 INCLUDE CHAMBER NUMBERS

RFT SAMPLE TEST REPORT

WELL :...MULLOWAY.....

OBSERVER :...IAN PALMER.....
DAVID BRAISTED

DATE :19/2/89.....

RUN NO.:...3.....

	CHAMBER 1 (6 GAL)	CHAMBER 2 (2.75 GAL)
SEAT NO.	3-21	3-21
DEPTH	1379.5 m MDKB	1379.5 m MDKB
A. RECORDING TIMES		1ST ATTEMPT/SECOND ATTEMPT
Tool Set	12:15	12:41
Pretest Open		
Time Open		
Chamber Open	12:19	12:34 12:43
Chamber Full	12:28	
Fill Time	9 MIN	
Start Build up		
Finish Build up	12:32	
Build Up time		
Seal Chamber	12:32	
Tool Retract		12:47
Total Time		32MIN
B. SAMPLE PRESSURES HP		HP GAUGE
IHP (PSIA)	2262.8	2262.3
ISIP	1958.39	1958.06 1958.6
Initial Flowing Press.	974	SEAL FAILURE SEAL FAILURE
Final Flowing Press.	1400	
Sampling Press. Range		
FSIP	1957.70	
FHP		
Form.Press.(Horner)		
C. TEMPERATURE		
Depth Tool Reached		
Max.Rec.Temp.	149.5	
Time Circ. Stopped		
Time since Circ.		
Form.Temp.(Horner)		
D. SAMPLE RECOVERY		
Surface Pressure	120	
Amt Gas	NEG	
Amt oil	4.3	
Amt Water	16.95	
Amt Others		MUD FILT. 6.1
E. SAMPLE PROPERTIES		
Gas Composition		
C1	94.15/93.15/75.9	ppm
C2	2.9/3.38/1.58	ppm
C3	1.58/0.95/1.12	ppm
IC4/nc4	1.30/0.71/0.55	ppm
C5	0.021/0.10/0.08	ppm
C6+	- NEG -	ppm
CO2/H2S	4/1	ppm
Oil Properties	32.4 °API @ 60 °F	°API @ °C
Colour	SIM. TO RUN # 2	
Fluorescence		
GOR		
Water Properties		
Resistivity	@ °C	@ °C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
Tritium(DPM)	2927 * DPM	ppm
Est. Water Type	FILTRATE	
Mud Properties		
Resistivity	43 @ 66°F	@ °C
NaCl Equivalent	ppm	ppm
Cl- titrated	16000	ppm
Calibration		
Calibration Press.	psig	psig
Calibration Temp.	°C	°C
Hewlett Packard No.		
Mud Weight		
Calc. Hydrostatic		
RFT Chokesize	.04	.02
REMARKS	* 3050 WHILE DRILLING INCLUDE CHAMBER NUMBERS	INCLUDE CHAMBER NUMBERS

WELL :.....MULLOWAY #1.....

RFT SAMPLE TEST REPORT

OBSERVER :...IAN PALMER.....
DAVE BRAISTED

DATE :19/2/89.....

RUN NO.....4.....

	CHAMBER 1 (6 GAL)	CHAMBER 2 (1 GAL)
SEAT NO. 4-22B	4-22B	4-22B
DEPTH 1395.8 m MDKB	1395.8 m MDKB	1395.8 m MDKB
A. RECORDING TIMES		
Tool Set	15:52	
Pretest Open		
Time Open		
Chamber Open	15:58	16:10
Chamber Full	16:05	16:12
Fill Time	7 MIN	2 MIN
Start Build up		
Finish Build up		
Build Up time		
Seal Chamber	16:08	16:15
Tool Retract		16:17
Total Time		25 min
B. SAMPLE PRESSURES HP		
	HP GAUGE	HP GAUGE
IHP PSIA	2286.8	psi'a
ISIP	1972.68	1972.51
Initial Flowing Press.	1953	1960
Final Flowing Press.	1942	
Sampling Press. Range		
FSIP	1972.43	1972.43
FHP		2286.9
Form.Press.(Horner)		
C. TEMPERATURE		
Depth Tool Reached		
Max.Rec.Temp.	151.6	151.4
Time Circ. Stopped		
Time since Circ.		
Form.Temp.(Horner)		
D. SAMPLE RECOVERY		
Surface Pressure	.50	psig
Amt Gas	NEG	lit. PRESERVED
Amt oil	19.5	lit. UNOPENED
Amt Water	1.6	lit.
Amt Others		lit.
E. SAMPLE PROPERTIES		
Gas Composition		%
C1	89.7/89.97/96.6	ppm
C2	2.81/2.25/2.7	ppm
C3	.16/.14/.15	ppm
IC4/nC4	.18/.14/.18	ppm
C5	.031/.030/.03	ppm
C6+	- NEG -	ppm
CO2/H2S		ppm
Oil Properties	29 °API @ 60 °F	°API @ °C
Colour		
Fluorescence		
GOR		
Water Properties		
Resistivity	@ °C	@ °C
NaCl Equivalent		ppm
Cl-titrated		ppm
Tritium(DPM)	953 DPM *	ppm
Est.Water Type		
Mud Properties		
Resistivity	@ °C	@ °C
NaCl Equivalent		ppm
Cl-titrated	6000	ppm
Calibration		
Calibration Press.		psig
Calibration Temp.		°C
Hewlett Packard No.		
Mud Weight		
Calc.Hydrostatic		
RFT Chokesize	.04	.02
REMARKS	* 3050 DPM WHEN DRILLING INCLUDE CHAMBER NUMBERS	RFS AD 1151 INCLUDE CHAMBER NUMBERS

RFT SAMPLE TEST REPORT

WELL :... MULLOWAY.....

OBSERVER IAN PALMER/

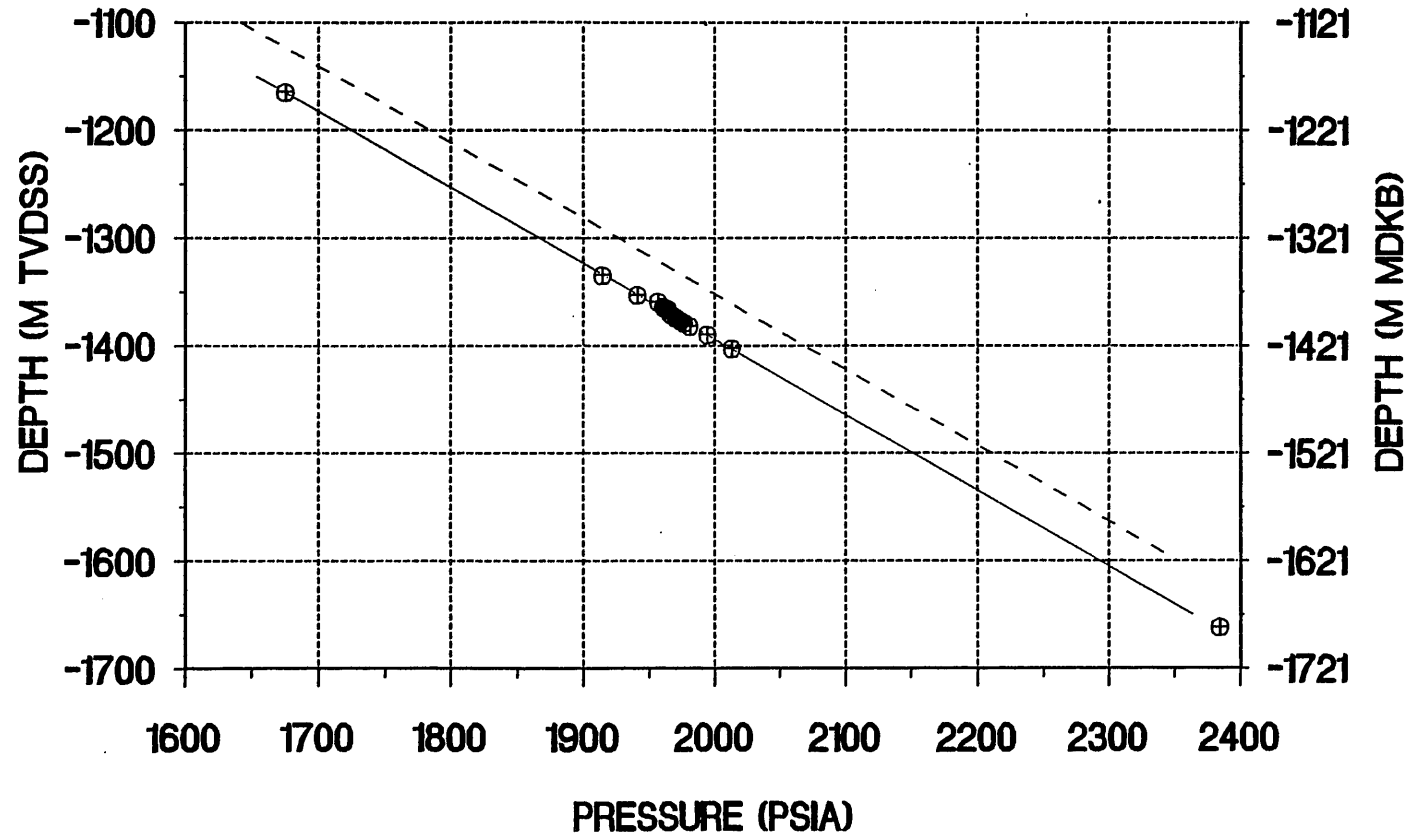
DATE : 19/2/89

RUN NO... 5

DAVE BRAISTED

	CHAMBER 1 (6 GAL)	CHAMBER 2 (1 GAL)
SEAT NO. 5-23	5-23	5-23
DEPTH 1396.8m MDKB	1396.8 m MDKB	1396.8 m MDKB
A. RECORDING TIMES		
Tool Set		
Pretest Open	18:55	
Time Open		
Chamber Open	19:02	19:15
Chamber Full	19:12	19:19
Fill Time	10 MIN	4 MIN
Start Build up		
Finish Build up		
Build Up time		
Seal Chamber	19:14	19:21
Tool Retract		
Total Time	hrs.	hrs.
B. SAMPLE PRESSURES HP		
	HP GAUGE	HP GAUGE
IHP (PSIA)	2285.5 psia	psia
ISIP	1975.04 psia	1974.68 psia
Initial Flowing Press.	1637	1935 psia
Final Flowing Press.		1934 psia
Sampling Press. Range		
FSIP	1974.61 psia	1974.57 psia
FHP		2288.9 psia
Form.Press.(Horner)		
C. TEMPERATURE		
Depth Tool Reached	m	m
Max.Rec.Temp.	148.5 ° F	153 ° F
Time Circ. Stopped	hrs.	hrs.
Time since Circ.	hrs.	hrs.
Form.Temp.(Horner)	°C	°C
D. SAMPLE RECOVERY		
Surface Pressure	0 psig	0 psig
Amt Gas	0 lit.	0 lit.
Amt oil	0 lit.	0 lit.
Amt Water	22 lit.	4 lit.
Amt Others	lit.	lit.
E. SAMPLE PROPERTIES		
Gas Composition		
C1	ppm	ppm
C2	ppm	ppm
C3	ppm	ppm
IC4/nC4	ppm	ppm
C5	ppm	ppm
C6+	ppm	ppm
CO2/H2S	ppm	ppm
Oil Properties		
Colour	°API@	°API@
Fluorescence		
GOR		
Water Properties		
Resistivity	@ °C	@ °C
NaCl Equivalent	ppm	ppm
Cl-titrated	8000 ppm	ppm
Tritium(DPM)	1526/1423 DPM	ppm
Est.water type		
Mud Properties		
Resistivity	@ °C	@ °C
NaCl Equivalent	ppm	ppm
Cl-titrated	ppm	ppm
Calibration		
Calibration Press.	psig	psig
Calibration Temp.	°C	°C
Hewlett Packard No.		
Mud Weight		
Calc.Hydrostatic		
RFT Chokesize	.04	.02
REMARKS	INCLUDE CHAMBER NUMBERS	INCLUDE CHAMBER NUMBERS

EXHIBIT 3: MULLOWAY-1 RFT DATA



--- GIPPSLAND

— MULLOWAY

⊕ ⊕ ⊕ RFT: MULLOWAY

**THE SCHLUMBERGER REPORT
SONIC CALIBRATION
AND GEOGRAM
PROCESSING REPORT**

CONGER #1 ? MULLHONEY 1

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