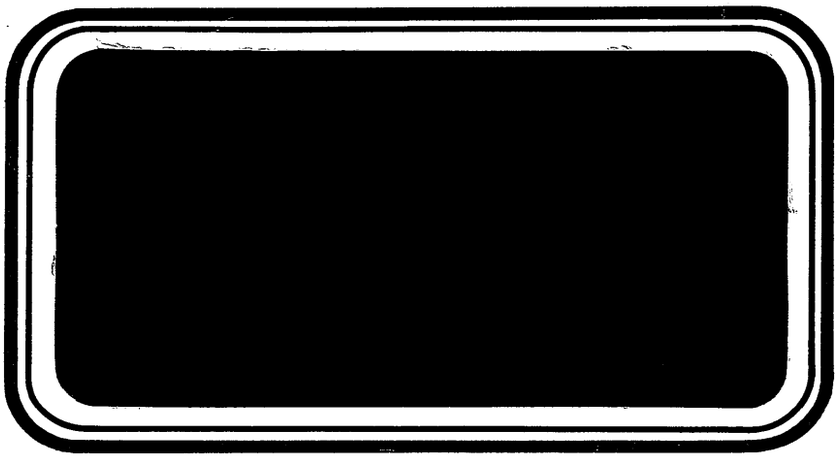
W795



WCR SELENE-1
(W795)

PHILLIPS
PETROLEUM
66

PHILLIPS AUSTRALIAN OIL COMPANY
PERTH, WESTERN AUSTRALIA

WELL COMPLETION REPORT

SELENE NO. 1

PERMIT VIC/P18

VICTORIA

By

PHILLIPS AUSTRALIAN OIL COMPANY

Perth, Australia

July, 1983

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SUMMARY

Drilling

The Selene No. 1 well was drilled from the Semi-Submersible drilling unit Diamond M "Epoch" in a water depth of 253 metres. The well was drilled to a total depth of 3539 metres* in 54 days.

The Diamond M "Epoch" arrived on location at 0805 hours on December 22, 1982 and the well was spudded at 0130 hours on December 27, 1982. A penetration test was conducted with a 14-3/4 inch bit. The bit penetrated 7.6 metres into the seabed with 25,000 pounds bit weight. After the test was completed, a 36-inch hole was drilled to 328 metres. The 30-inch conductor was run and cemented with the casing shoe at 327 metres. Next, a 26-inch hole was drilled to 591 metres. The 20-inch conductor was run and cemented with the casing shoe at 581.5 metres.

The 16-3/4 inch blowout preventer stack was run with 18-5/8 inch marine riser. This operation took nine days due to leaks in the choke and kill lines and non-operational fail-safe valves. The fail-safe valves and the choke and kill line connectors were repaired and the BOP stack was tested to PAOC's specifications. A 17-1/2 inch hole was drilled and underreamed simultaneously with a 14-3/4 inch bit on a 17-1/2 inch underreamer to 595 metres. At this point a formation leak-off test was performed. The test indicated that formation leak-off occurred at an equivalent mud weight of 11.7 ppg. The 17-1/2 inch hole was then drilled and underreamed to 1269 metres. The electric logs were run and the 13-3/8 inch surface casing was run and cemented with the casing shoe at 1262 metres.

*All depths quoted are from rotary kelly bushing was located 23 metres above mean sea level.

A formation leak-off test was performed after drilling 3 metres of new 12-1/4-inch hole below the 13-3/8-inch casing shoe. The test indicated that formation leak-off occurred at an equivalent mud weight of 17.8 ppg. The 12-1/4-inch hole was drilled to 2989 metres. (During this section of the hole one twist off occurred at 1916 metres and two wash-outs occurred at 2116 metres and 2214 metres.) The electric logs were run and sidewall cores were taken throughout the open hole. The 9-5/8-inch production casing was run and cemented with the casing shoe at 2876 metres.

A formation leak-off test was performed after drilling 3 metres of new 8-1/2-inch hole below the 9-5/8-inch casing shoe. The test indicated that formation leak-off occurred at an equivalent mud weight of 13.3 ppg. The 8-1/2-inch hole was drilled on to 3140 metres. At this point, core number 1 was cut from 3140 metres to 3155 metres. Ninety percent of this core was recovered. Core number 2 was cut from 3155 metres to 3163 metres. Eighty-three percent of the second core was recovered. The 8-1/2-inch hole was drilled on to 3539 metres. Electric logs and a velocity survey was run. Sidewall cores were taken throughout the open hole. Preparations were made to plug the well.

An EZ-SV cement retainer was set at 2846 metres. One hundred and eighteen sacks of class "G" neat cement were squeezed below the retainer. Fifty sacks of cement were placed on top of the retainer. The top of the plug is at 2783 metres. The surface plug was placed from 365 metres to 294 metres.

The BOP stack and riser was pulled and recovered. An explosive charge was detonated 8 metres below the 16-3/4-inch wellhead. The 16-3/4-inch wellhead, 30 inch wellhead housing, 13-3/8-inch casing stub, and 9-5/8-inch casing stub were recovered.

The anchors were pulled and the "Epoch" departed the Selene No. 1 location at 1520 hours on February 13, 1983.

Geological

Selene No. 1 was the second exploration well drilled in Permit Vic/P18. The well was located 15.7 kilometres (9.8 miles) northeast of the first exploration well, Helios No. 1. The well was positioned to evaluate the hydrocarbon potential of Top Latrobe and intra-Latrobe objectives and to determine stratigraphic facies relationships and hydrocarbon potential of the upper portion of the Latrobe sequence.

Samples were not caught prior to drilling out the 20-inch casing shoe at 581.5 metres. The interval 600 metres to 2234 metres consisted of calcarenites and calcilutites of Mid-to-Late Miocene age representing the Gippsland Limestone. The Gippsland Limestone is conformably underlain by calcareous claystones, shales and marls of the Lakes Entrance Formation. A major unconformity at 2807 metres divides the Lakes Entrance Formation into Early Eocene and earliest Oligocene sediments. Sediments of the Lakes Entrance Formation give way conformably to claystones of the latest Eocene Colquohoun Formation at 2821 metres. A 2 million year hiatus separates the Colquohoun Formation at 2822.5 metres from the sandstones and minor mudstones of the late Mid-Eocene Gurnard Formation. The Gurnard Formation is in turn separated by a 7 million year hiatus from the underlying sandstones, siltstones and claystones of the early Mid-Eocene Flounder Formation at 2839 metres.

At 2848 metres the Flounder Formation unconformably overlies Latrobe Group coarse clastics of Maastrichtian/Paleocene (?) age. The Latrobe coarse clastics continued downward to 2986 metres changing in age from Maastrichtian/Paleocene (?) to definite Maastrichtian at 2875metres. Beginning at 2986 metres the massive sands give way to finergrained sands interbedded with siltstones. The first coals deposited in a paludal swamp environment occur at 3093 metres and are interbedded with shales, siltstones, claystones and sandstones which continue to 3436 metres. The paludal swamp sediments change in age from Maastrichtain to Campanian at 3195.5 metres and are underlain by braided-stream sands with minor claystones, shales and coals to the total depth of the well at 3539 metres.

Hydrocarbon indications in Selene No. 1 consisted of only slight oil and gas shows within the Latrobe Group. The absence of significant accumulations of hydrocarbons is attributed to the lack of structural closure at Top Latrobe level and to the thermal immaturity of adjacent source rocks for intra-Latrobe reservoirs.

INTRODUCTION

Selene No. 1 was the second well to be drilled in Exploration Permit Vic/P18 off the southeastern coast of Victoria, Australia by the co-venturers consisting of Phillips Australian Oil Company (Operator), Mount Isa Mines Limited, and Lend Lease Petroleum Limited. Selene No. 1 was located at Latitude 38°37' 25.159" South and Longitude 148°26' 11.357" East (Figure 1). Drilling was performed from the Semi-Submersible drilling unit Diamond M "Epoch" in 253 metres of water.

The Selene No. 1 well was located primarily to test a large seismically-defined structural/stratigraphic anomaly mapped within the Latrobe Group. The dip-closed anomaly was mapped on the downthrown side of a northwest-southeast trending fault and was interpreted as a possible strike valley sand body. Southwesterly dip into the fault was considered to be indicative of movement along the fault contemporaneous with deposition. A marked lateral change in seismic character was considered to represent possible shaleout of the sand body in all other directions.

A secondary target in the well was a small, questionable closure mapped at the top of the Latrobe Group. This closure was considered to be caused by drape over the underlying anomaly. A third exploration objective was to determine stratigraphic facies relationships and hydrocarbon potential of the intra-Latrobe sequence.

PE906297

This is an enclosure indicator page.
The enclosure PE906297 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906297 has the following characteristics:

ITEM_BARCODE	= PE906297
CONTAINER_BARCODE	= PE902605
NAME	= Location Map
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= GENERAL
SUBTYPE	= PROSPECT_MAP
DESCRIPTION	= Location Map showing VIC/P18 and Selene-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

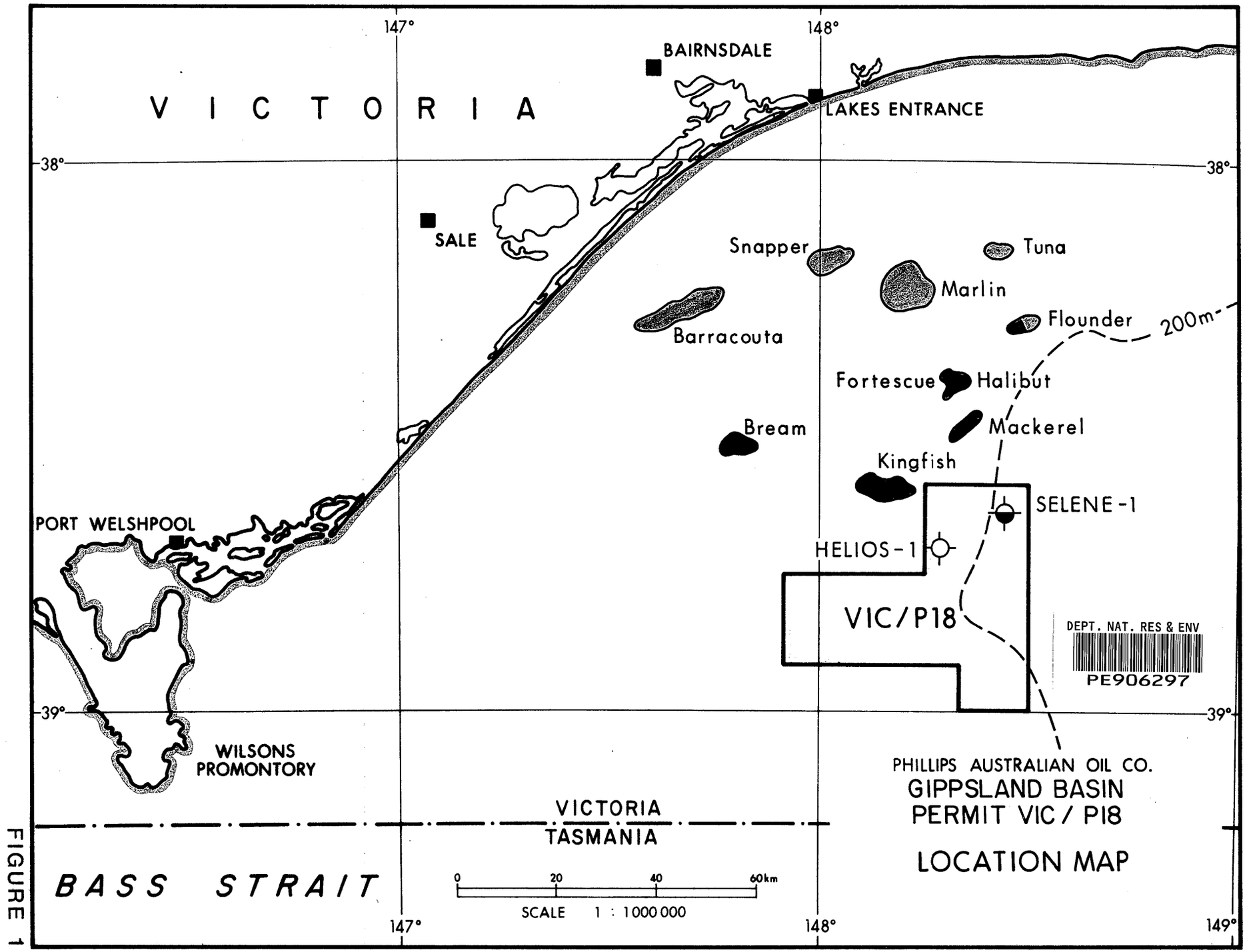


FIGURE 1

A-5405-3

WELL HISTORY

The following provides details on the operational parameters of Selene No. 1.

General Data

Well Name	:	Selene No. 1
Name and Address of Operator	:	Phillips Australian Oil Company 23rd floor, City Centre Tower 44 St. George's Terrace PERTH, W.A. 6000 (G.P.O. Box 2066W) PERTH. W.A. 6001.
Co-Venturer Parties' Names and Addresses	:	Lend Lease Petroleum Limited Australia Square Tower, Level 36, SYDNEY, N.S.W. 2000 Mount Isa Mines Limited 15th floor, 160 Ann Street BRISBANE, Qld. 4000.
Exploration Permit	:	VIC/P18
District	:	Gippsland Basin, Victoria
Location	:	Lat. 38 degrees 37 min 25.159 sec South Long. 148 degrees 26 min 11.357 sec East
Elevations	:	Water depth 253 metres (830 feet) R/T to seabed 276 metres (960 feet)
Total Depth	:	3539 metres (11,611feet) RKB
Status	:	Plugged and Abandoned

DRILLING DATA

Name and Address of Drilling Contractor	:	Diamond "M" Marine Company 2121 Sage Road, Suite 200 P.O. Box 22738 Houston, Texas 770727 U.S.A.
Drilling Vessel	:	Diamond M "Epoch" Semi-Submersible Drilling Unit Length : 290 feet Beam : 200 feet Lower Hull Beam : 35 feet Lower Hull Depth : 25 feet Lightship Dis-placement :7754 long tons
Operating Depth	:	30,000 feet in 1,200 feet of water
Position System	:	Honeywell RS-505 Acoustic Position and Riser Angle indicator
Heave Compensator	:	Vetco 400-20D with 400,000 lbs capacity - 20' stroke
Riser Tensioning	:	6ea - Western Gear 80,000 lbs - 50' stroke
Guide Line Tensioning	:	4 ea - Western Gear 16,000 lbs - 40' stroke
Slip Joint	:	Vetco X-52 with MR-4B connectors - 80' stroke
Riser	:	Vetco X-52 18-5/8" x 5/8" wall MR-4B connectors
Diverter	:	Regan Model KFDH-3
B.O.P.	:	16-3/4" - 10,000 lbs working pressure - H2S Trimmed/Vetco Ball Joint with MR-4B connector/C.I.W. Riser connector/Two Hydril annular preventors/Two-Double "U" Cameron

B.O.P. Control System	:	Koomey with Acoustic Back-up
Choke Manifold	:	10,000 lbs working pressure - H2S trimmed with cameron type F Gate valves/Two adjustable chokes and one remote operated Swaco Super Choke.
Pumps	:	Two Oilwell 1700 PT Triplex pumps with pulsation dampeners. Each driven by two GE-752 DC motors. Mud Pumps to be charged by two 6 x 8 centrifugal pumps.
Drawworks	:	Oilwell E-3000 driven by two 6E 752 DC motors, with Baylor 7838 electric brake and Crown-O-Matic.
Power	:	Two EMD 16E-9 Diesel Engines, 3070 Hp. Each driving EMD 2000 KW AC Generators. One EMD 16E-8 Diesel Engine, 2200 Hp, driving EMD 1500 KW AC Generator.
Storage	:	Sack storage 3,500 sacks Bulk tanks 10,000 cu. ft. Mud tanks 1,594 BBLS Fuel 6,400 BBLS Drillwater 15,842 BBLS Potable water 755 BBLS Mud volume active 660 BBLS Mud volume reserve 681 BBLS Helifuel 2 ea 5,000 litres

TIME ANALYSIS

Significant Times and Dates

	Hours	Date
Departed Helios No. 1 location	0030	22nd December, 1982
Arrived at Selene Location	0805	22nd December, 1982
Spud	0130	27th December, 1982
TD	0430	5th February, 1983
Depart Location	1520	13th February, 1983

Time Breakdown from transfer from Helios No. 1 till departure from Location

	Hours	%
Drilling	328.0	25.49
Reaming/Hole Opening	5.0	0.39
Cond. mud and circ.	50.5	3.92
Trips and making up BHA	265.0	20.59
Dev Survey	11.5	0.89
BOP Run/Retrieve	182.0	14.14
BOP Testing	29.0	2.25
Coring (Sidewall)	29.0	2.25
Logging	49.5	3.85
Cementing	16.0	1.24
DST/Leak off test	3.0	0.23
Repairs mechanical	2.5	0.19
Delays	86.5	6.72
Weather delays	18.5	1.44
Move and positioning	10.0	0.78
Casing	48.5	3.77
Velocity survey	8.5	0.66
Anchoring	114.0	8.86
Other	30.0	2.33
	1287.0	100.00

WELL COMPLETION RECORDS

Included in Tables 1-4 are details concerning the drilling and testing of Selene No. 1. Enclosure No.1 is the operational summary for Selene No. 1. A summary of daily operations is given in Appendix No. 2.

TABLE 1

SELENE NO. 1

TOTCO SURVEY SUMMARY

Depth m (ft.) RKB	Vertical Deviation - Degrees
300.2 (985)	0.75
327.9 (1076)	0.5
464.5 (1524)	Miss run
465.5 (1524)	0.5
591.3 (1940)	0.75
746.8 (2450)	1.0
848.3 (2783)	0.75
1151.2 (3777)	Miss run
1178.7 (3867)	1.0
1268.6 (4162)	0.25
1573.4 (5162)	0.5
1790.4 (5874)	1.0
2047.7 (6718)	1.0
2367.7 (7768)	0.5
2618.6 (8591)	0.5
2898.1 (9508)	0.75
3140.4 (10303)	2.0
3539.1 (11611)	6.25

Gyro survey (9-5/8 inch casing) at 2865m (9400 ft.) indicated 51.26 ft. north, 29 degrees 41 minutes 16 sec. west.

TABLE 2

SELENE NO. 1 CASING AND CEMENT

Permit VIC/P18

Elevations
RKB to MSL 23m (75.5 ft.)
RKB to seabed 276m (906 ft.)

Casing						Cement				
Date	Size	Weight	Grade & Coupling	Amount Run	Depth Set	Cuft Slurry	Class/Type	Slurry Weight	TOC	Additives
28.12.82	30"	1" wall	Vetco Squnch	52.9m	327.2m	1322.5	Class G/Neat mixed with seawater	15.8 PPG	seabed	Nil
30.12.82	20"	133 lb/ft	X-56 Cameron JV Type LW	306.0m	581.5m	Lead 2328	Class G/Neat mixed with drillwater	12.4 PPG	seabed	2.5% gel-water
						Tail 575	Class G/Neat mixed with drillwater	15.6 PPG		
12.1.83	13-3/8"	72 lb/ft	N-80 Buttress	986.7m	1262.1m	Lead 1601	Class G/Neat mixed with drillwater	12.8 PPG	405.0m	2.5% gel-water & 0.5% CFR-2
						Tail 575	Class G/Neat mixed with drillwater	15.6 PPG		0.1% HR-6L
28.1.83	9-5/8"	47 lb/ft	L-80 Buttress	2601.0m	2876.0m	Lead 1552	Class G/Neat mixed with drillwater	12.8 PPG	1170.0m	2.5% gel - water, 0.5% CFR-2 and 0.06% HR-6L
						Tail 575	Class G/Neat mixed with drillwater	15.8 PPG		0.5% CFR-2, 0.8% Halad 22A & 0.1% HR-6L

BIT RECORD

TABLE 3

COMPANY Phillips Australian Oil Company | CONTRACTOR Diamond M | COUNTY Victoria, Australia | STATE

LEASE	WELL NO.	SEC.	TOWNSHIP	RANGE	BLOCK	FIELD
Offshore	Selene-1				Vic/P18	Bass Strait

TOOL PUSHER	DRILL PIPE 5" E & S 135	DRAW WORKS Oilwell E-3000	
DAY DRILLER	TOOL JOINT MAKE — SIZE 4½ — TYPE IF	POWER Electric H.P	UNDER SURF
EVENING DRILLER	DRILL COLLAR NO 20 — O.D. 7-3/4" — I.D 2-13/16" — LENGTH 30'	PUMP NO. 1 MAKE Oilwell — MODEL A 1700 PT — STROKE 12"	INT. DATE 0130 27 Dec. 1982
MORNING DRILLER	DRILL COLLAR NO 30 — O.D 6½" — I.D 2-13/16" — LENGTH 30'	PUMP NO 2 MAKE Oilwell — MODEL A 1700 PT — STROKE 12"	T.D. DATE 0430 5 Feb. 1983

BIT NO	BIT SIZE	BIT MFGR.	BIT TYPE	SERIAL NO. OF BIT	JET SIZE 1	2	3	DEPTH OUT	FTGE	HOURS RUN	ACC. HOURS	FT/HR	WEIGHT 1000 LBS.	ROTARY R.P.M	VERT. DEV.	PUMP PRESS	PUMPS No.	Liner	SPM	MUD Wt	Vis	DULL CODE T	B	G	REMARKS FORMATION, CIRC FLUID, ETC.	DATE
1	14¾	Smith	DSJ	AU 8141	14	14	14	931	25	-	-	-	25	-	-	900	½	6.5	160	8.6	80+	1	1	1	Jetting test	27/12/82
2 (RR)	26	HTC	OSC 3AJ	JL 109	28	28	28	1076	170	2.5	2.5	68	0/5	100	½	1200	½	6.5	200	8.6	100+	1	8	1	Used on other wells Bearings gone	28/12/82
3	26	HTC	OSC 3AJ	JL 117	28	28	28	1940	867	10	12.5	86.7	5/15	100	¾	1200	½	6.5	200	8.6	100+	OK		for RR		30/12/82
RR 1	14¾	Smith	DSJ	AV8141	22	22	22	2783	843	16	28.5	52.7	15	70	¾	2100	½	6.5	220	9.1	33	3	3	I	Drilling & under-reaming	10/1/83
4	14¾	Smith	DSJ	MA2263	22	22	22	4162	1379	25.5	54	54	3840	110	1	2800	½	6.5	228	9.1	34	3	4	I	Drilling & under-reaming	12/1/83
5	12¼	Smith	SDS	BS 1891	14	14	14	5238	1076	33	87	32	45	120	½	2800	½	6.5	282	9.1	40	4	3	1/8		15/1/83
6	12¼	Reed	HS 51J	635694	14	14	14	5295	57	4	91	14	50	120	½	2800	½	6.5	280	9.2	39	1	1	I (new)		15/1/83
7	12¼	Smith	SDS	CH 4911	14	14	14	5874	579	24.5	115.5	23	45/50	120	1	2800	½	6.5	276	9.4	40	6	3	1/8		17/1/83
8	12¼	Smith	SDT	CK 4562	14	14	15	6287	413	18.5	134	22	55	120	1	2500	½	6.5	280	9.4	41	4	3	1/8		19/1/83
9	12¼	Smith	SDT	CK 4611	15	14	14	6718	431	17	151	25	60	110	1	2800	½	6.5	272	9.4	47	4	3	I		20/1/83
10	12¼	Smith	SDGH	CK 2897	14	15	15	6941	223	12.5	163.5	18	60	110	1	2740	½	6.5	280	9.3	47	2	2	1/8		21/1/83
11	12¼	Smith	SDT	CK 4049	14	15	15	7264	323	15	178.5	21.5	50	120	-	2800	½	6.5	280	9.4	46	6	2	I		22/1/83
12	12¼	Smith	SDGH	XB 3178	14	15	15	8591	1327	39	217.5	34	50	120	½	2800	½	6.5	278	9.4	47	4	6	1/16		24/1/83
13	12¼	Smith	SDT	CK 4050	14	15	15	9508	917	22	239.5	42	40/50	120	½	2800	½	6.5	274	9.4	44	4	4	1/8-1/8		27/1/83
14	8½	Smith	F-2	CF 7308	12	10	10	10303	795	23.5	263	34	30	65/70	2	2500	2	6.5	84	9.0	41	3	3	1/8-1/8		1/2/83
CH1	8½	ACC Star	RM Flash	20674	32	32	32	10352	49	8.5	271.5	5.8	18	100	-	580	1	6.5	37	9.0	44					2/2/83
CH2	8½	ACC Star	FD	20682	32	32	32	10376	24	8	279.5	3	10	70	-	600	2	6.5	42	9.0	45					3/2/83
15	8½	Smith	F-2	X 7169	10	10	10	11611	1235	60.0	339.5	20.8	30	65	6½	2600	1	6.5	73	9.0	45	5	4	1/8		6/2/83

TABLE 4

SELENE NO. 1

SQUEEZE RECORD

Date	Size of Casing	Retainer		Cement				
		Type	Set	Slurry Cuft	Class/Type	Slurry wt	Additives	Company
8.2.83	9-5/8", 47 lb, L-80 Buttress	EZ-SV	2845.3m (9335 ft)	136	Class G/Neat	15.8 PPG	None	Halli-burton

DRILLING FLUIDS

The hole was spudded using sea water, periodically flushing with high viscosity pills. Sea water-Drispac was used from 591 metres to TD. Mud properties, materials and cost are given in Tables 5-7.

ABANDONMENT STATUS

Figure 2 shows the abandonment status for the Selene No. 1 well.

TABLE 5

SELENE NO. 1

MUD PROPERTIES

Depth (m)	Hole Size (inches)	Temp (°C)	Weight (ppg)	Viscosity (sec)	PV	YP	PH
328	36	-	8.6	100+	-	-	-
465	26	-	8.6	100+	-	-	-
591	26	-	8.6	100+	-	-	-
848	17-1/2	24	9.1	33	4	13	9.5
1187	17-1/2	25	9.1	32	2	7	9.5
1269	17-1/2	24	9.1	33	3	9	10.5
1478	12-1/4	25	9.2	36	8	10	11.5
1612	12-1/4	25	9.2	40	9	15	10.5
1758	12-1/4	24	9.2+	40	7	16	9.5
1875	12-1/4	24	9.3	40	10	10	10.5
1916	12-1/4	28	9.3+	47	15	12	10.0
1989	12-1/4	-	9.4	41	13	11	10.0
2057	12-1/4	24	9.4	47	14	11	10.0
2138	12-1/4	28	9.3+	47	14	11	10.5
2214	12-1/4	32	9.4	46	11	11	9.5
2368	12-1/4	33	9.4	43	10	10	8.5
2619	12-1/4	38	9.5	51	12	17	9.0
2847	12-1/4	41	9.5	45	12	28	9.5
2898	12-1/4	38	9.4+	42	11	18	9.0
2927	8-1/2	27	9.0	39	9	8	9.5
3102	8-1/2	32	9.0	42	11	10	9.0
3143	8-1/2	28	9.0	44	9	13	9.0
3160	8-1/2	27	9.0	45	11	11	8.5
3211	8-1/2	30	9.1	42	10	11	8.5
3356	8-1/2	28	9.0	41	10	10	10.0
3524	8-1/2	28	9.0	44	14	16	10.0
3539	8-1/2	-	9.0	42	13	13	10.0

TABLE 6

SELENE NO. 1

MUD MATERIALS

Type	Unit	Quantity
Aquagel	100 lbs	1600
Aluminium Stearate	25 kg	2
Baradefoam	20 ltr	20
CMC-L.V.	25 kg	33
Caustic soda	70 kg	124
Desco	25 lbs	160
Dextrid	50 lbs	207
Drispac	50 lbs	163
Lime	25 kg	18
Magnesium Oxide	20 kg	0
Monpac	25 kg	5
Monpac Ultra-lo	25 kg	24
Q-Broxin	25 kg	98
Soda Ash	40 kg	112
Soltex	50 lbs	227
XC Polymer	50 lbs	14
Baroid (Bulk)	100 lbs	1,040
Fresh Water	BBL	5,465
Sea Water	BBL	14,540
Total Mud made	BBL	20,005

TABLE 7

SELENE NO. 1

MUD COST

Interval	Hole Size		Cost A$
Seabed to 591.3m	36"/26"		5,185.65
591.3m to 1268.6m	17-1/2"		13,832.28
1268.4m to 2898.1m	12-1/4"		63,244.83
2898.1m to 3539.1m	8-1/2"		29,241.04
		TOTAL:	$111,503.80

SELENE No. 1 - ABANDONMENT STATUS

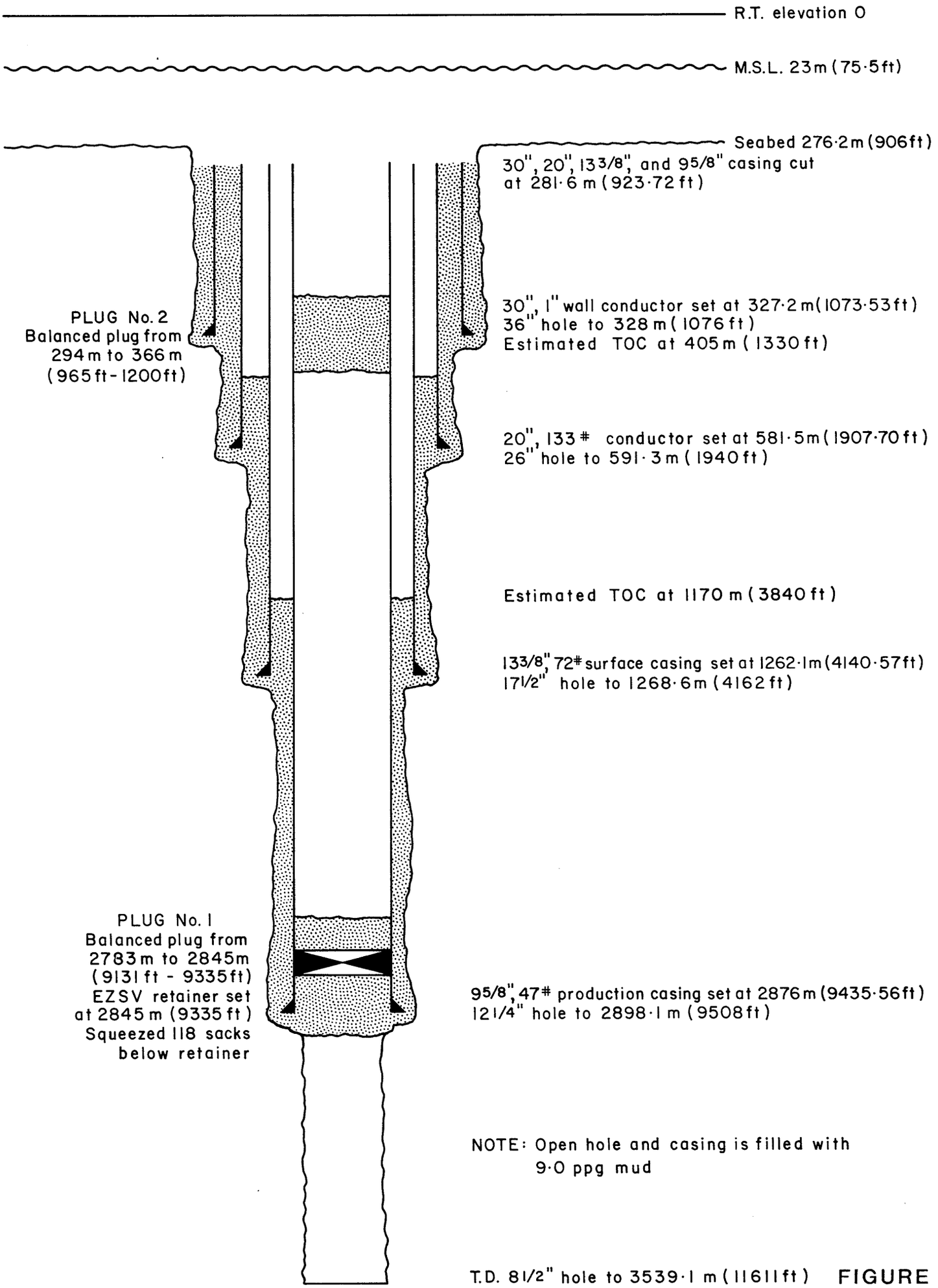


FIGURE 2

A-5784

GEOLOGY

SUMMARY OF PREVIOUS INVESTIGATIONS

Offshore exploration began in the 1950's when the Bureau of Mineral Resources conducted regional gravity and aeromagnetic surveys over limited onshore and offshore areas. The main exploration effort began in 1960 when Broken Hill Proprietary Limited (BHP) through its subsidiary, Hematite Petroleum Limited, applied for an exploration permit over the major portion of the offshore Gippsland Basin. This was Permit Vic/P1.

Results of regional aeromagnetic and reconnaissance seismic surveys were so encouraging that by May 1964 Esso Australia Limited and Hematite Petroleum Limited had concluded an agreement for the joint exploration of the offshore Gippsland Basin.

On June 5, 1965, Barracouta No. 1, the first offshore Gippsland Basin well was abandoned as a gas discovery. To date more than 100 exploration and step-out wells have been drilled in the offshore Gippsland Basin. Twelve oil and gas fields have been declared commercial by Esso-BHP since 1965 with recoverable reserves of approximately 3.6 billion barrels of oil and 8 trillion cubic feet of gas.

Two wells were drilled by Esso/BHP within the Permit Vic/P18 area during 1972/73. These were Pike No. 1 and Moray No. 1, which were both plugged and abandoned as dry holes. A number of seismic surveys were also conducted by Esso/BHP within the permit area, mainly over the period 1968 to 1974.

Following the second mandatory relinquishment of a portion of Permit Vic/P1, Phillips Australian Oil Company and co-venturers were granted Exploration Permit Vic/P18 on September 2, 1981. A 2,303 kilometre seismic survey was recorded in November/December, 1981 with processing completed by early April, 1982. The Helios No. 1, the first well drilled in Permit Vic/P18, was spudded on October 28, 1982 and plugged and abandoned as a dry hole at a T.D. of 3500 metres on December 22, 1982.

REGIONAL GEOLOGY

The development of the Gippsland Basin can be attributed to two separate phases of continental rifting and separation, firstly that of the Lord Howe Rise and New Zealand land mass from eastern Australia in Late Jurassic - Late Cretaceous time and secondly that of Antarctica from southern Australia in Late Cretaceous - Early Eocene time. Both phases are part of the fragmentation of Eastern Gondwanaland.

The Gippsland Basin developed as a consequence of a divergent wrench shear associated with early rifting, as did also the en-echelon Bass, Torquay and Otway Basins. These wrench shear zones developed in narrow linear rift basins linking the main extensional rift around the southern and eastern margins of the Australian continental plate. The first major unconformity in the Gippsland Basin is seen as the base Upper Jurassic and is related to the onset of rifting between southeastern Australia and the Lord Howe Rise. The Tasman Sea breakup unconformity is the second major unconformity in the Gippsland Basin and can be correlated with the top of the Strzelecki Group sediments (Figure 3).

With continued divergent wrench motion between southeastern Australia and Tasmania during the Late Cretaceous to Eocene, second-order left-lateral wrench motion along northwest-southeast extensional faults (tension gashes) became the loci for wrench-induced anticlines along pre-existing faults. With continued opening of the Tasman Sea most of the extensional faults were downthrown to the northeast (Figure 4).

APPENDIX NO. 1

GOVERNMENT APPROVALS

1·7·20

OK

AG

DEPARTMENT OF MINERALS AND ENERGY

PRINCES GATE EAST 151 FLINDERS STREET MELBOURNE, VIC. 3000

TELEPHONE (03) 653 9200 TELEX: MINERG AA 36595

13-12-82

Our Ref. IF/ML
Your Ref.
Contact
Ext. 333

7 December 1982

Mr O J Koop
Manager
Phillips Australian Oil Company
GPO Box 2066
PERTH WA 6001

Dear Mr Koop

This is to confirm our telex of December 7, 1982 that Designated Authority approval has been granted to Phillips Australian Oil Company for a revision to the location of the new field wildcat well Selene No.1. A typographical error appears on your letter of request, November 26, 1982, namely that the longitude is 148° rather than 48°.

The new location we acknowledge is shot point 180 on line GP81-91 the co-ordinates of which are -

38° 37' 24.97" south latitude
148° 26' 11.51" east longitude

You are reminded to advise the Australian Coastal Surveillance Centre in Canberra of the movements of the drilling vessel Diamond M Epoch when Designated Authority consent has been granted to vacate the Helios site.

The Designated Authority is encouraged by your adherence to your exploration and drilling programme offshore Victoria and wishes good luck with Selene No.1 and hopes for a successful discovery.

Yours faithfully

R F Hudson
ACTING DIRECTOR
OIL & GAS DIVISION

DEPARTMENT OF MINERALS AND ENERGY

PRINCES GATE EAST 151 FLINDERS STREET MELBOURNE, VIC 3000

TELEPHONE: (03) 653 9200 TELEX: MINERG AA 36595

Our Ref. KW/ML
Your Ref.
Contact
Ext. 335

17 November 1982

Mr. O. J. Koop
Manager
Phillips Australian Oil Company
23rd Floor
City Centre Tower
44 St. Georges Terrace
PERTH WA 6000

Dear Sir

PETROLEUM (SUBMERGED LANDS) ACT 1967
CONSENT TO DRILL SELENE-1

You are advised that under Clause 3 of the Direction as to Drilling Operations, Designated Authority approval has been granted to your request to drill the new field wildcat Selene-1 in VIC/P18 using the semi-submersible drilling vessel "Diamond M Epoch". This approval is subject to the following conditions -

1. Your Company shall avoid the use of pennant lines and anchor buoys and rely on chain chaser techniques for anchor retreival. Alternatively, rig anchor marker buoys, if deployed, shall carry warning lights the characteristics of which shall satisfy the Commonwealth Department of Transport and Construction.

2. A preliminary abandonment programme shall be submitted to the Designated Authority at least one week prior to the submission of the detailed (post final logs) abandonment programme.

3. Phillips Australian Oil Company keeps the Australian Coastal Surveillance Centre, Canberra, informed of the movements of the drilling vessel.

4. Daily tour sheets are to be lodged weekly with the Designated Authority.

Yours faithfully

J. L. LePage
DIRECTOR
OIL & GAS DIVISION

DEPARTMENT OF MINERALS AND ENERGY
PRINCES GATE EAST 151 FLINDERS STREET MELBOURNE, VIC. 3000
TELEPHONE: (03) 653 9200 TELEX: MINERG AA 36595

Our Ref. KW/ML
Your Ref.
Contact
Ext. 335

20 December 1982

Mr O J Koop
Manager
Phillips Australian Oil Company
23rd Floor
City Centre Tower
44 St Georges Terrace
PERTH WA 6000

Dear Sir

PETROLEUM (SUBMERGED LANDS) ACT 1967
REVISION TO DRILLING PROGRAMME - SELENE-1

I refer to your letter of 9 December 1982 and wish to advise that Designated Authority approval has been obtained in respect of the revised drilling programme for the Selene-1 wildcat well.

Yours faithfully

J L LePage
DIRECTOR
OIL & GAS DIVISION

APPENDIX NO. 2

DAILY DRILLING SUMMARY

DAILY DRILLING SUMMARY

(Covers previous 24 hour period to 0800 hours on report date)

Date	Total Depth (metres RKB)	Work Performed
22nd December, 1982		Rig released 0030 hours from Helios No. 1 location. Under tow to Selene No. 1 location. Position at 0800 hours: 38 degrees 37 min 24.97 sec S 148 degrees 26 min 11.51 sec Bearing: 266 degrees.
23rd December, 1982		Dropped first anchor on new location at 0805 hours EST. Ran and set piggybacks on anchors No. 3, 6 and 7. Ran anchor 2, operations were shut down nine hours while workboat stood by in rest period.
24th December, 1982		Piggybacked anchor No. 2. Ran anchors 1,4,5, and 8. Pre-tensioned point anchors No. 2, 3, 6 and 7. Operations were shut down nine hours while workboats stood by in rest period.
25th December, 1982		Piggybacked anchors No. 1, 4, 5, and 8. Storm tested all anchors to 350,000 pounds tension. Operations were shut down one hour while workboat stood by in rest period.
26th December, 1982		Positioned rig over correct well location and ran floating guide base. Well location: 38 deg. 37 min. 25.149 sec S 148 deg. 26 min. 11.357 sec E Bearing: 213 deg. Water depth: 255 metres. Shut down 14 hours due to malfunctions in ROV system.

Date	Total Depth (metres RKB)	Work Performed
27th December, 1982		Positioned floating guide base. Conducted penetration test; 14-3/4 inch bit penetrated 7.6 metres with 26,000 pounds bit weight. Operations were shut down three hours due to malfunctions in ROV system.
28th December, 1982	328m	Drilled 36 inch hole to 328 metres RKB (survey at 328 metres RKB indicated 0.5 degrees). Ran 30 inch conductor to 327 metres RKB. Cemented conductor with 1150 sacks of class "G" cement mixed at 15.8 PPG.
29th December, 1982	591m	Drilled 26 inch hole to 591 metres RKB. Circulated hole and prepared to run 20 inch casing.
30th December, 1982	591m	Ran 20 inch casing with 16-3/4 inch wellhead. Casing shoe set at 582 metres RKB. Cemented casing with 1200 sacks class "G" cement mixed with 2.5% prehydrated gel water at 12.4 PPG followed with 500 sacks class "G" neat cement at 15.6 PPG.
31st December, 1982	591m	Assembled and tested BOP package.
1st January, 1983	591m	Repaired and tested BOP package.
2nd January, 1983	591m	Ran and tested marine riser and BOP package.
3rd January, 1983	591m	Repaired and tested marine riser.
4th January, 1983	591m	Repaired and tested marine riser.
5th January, 1983	591m	Ran and tested marine riser slip joint.

Date	Total Depth (metres RKB)	Work Performed
6th January, 1983	591m	Latched BOP and started testing the BOP assembly. Tested all rams and found failsafe valves not functioning properly. Unlatched BOP and started pulling BOP and riser.
7th January, 1983	591m	Pulled BOP and riser. Made alterations to failsafe valves and tested same. Rigged up to run BOP. Started running BOP and riser testing choke and kill lines while running.
8th January, 1983	591m	Continued running BOP stack. Found leak between upper and lower package at female kill line connection. Pulled riser and BOP. Removed choke and kill line connectors and sent to machine shop for repairs. Installed choke and kill line connectors and prepared stack to run.
9th January, 1983	591m	Ran BOP stack and riser testing every joint. Had to repack three connectors due to leaks. Tested BOP to PAOC specifications and 20 inch casing to 500 psi. Ran in hole with 17-1/2 inch bottom hole assembly and tagged cement at 395 metres. Drilled cement with 14-3/4 inch bit and 17-1/2 inch under-reamer from 396 metres to 557 metres.
10th January, 1983	931m	Drilled cement and float collar to 575 metres and tested 20 inch casing to 500 psi. Drilled out cement and float shoe and made 10 feet of new hole to 595 metres. Conducted leak-off test. Formation leaked off at equivalent mud weight of 11.7 pounds per gallon.

Date	Total Depth (metres RKB)	Work Performed
		Drilled and under-reamed 17-1/2 inch inch hole from 595 metres to 931 metres. Survey at 848 metres was 3/4°.
11th January, 1983	1264m	Drilled and under-reamed 17-1/2 inch hole from 931 metres to 1264 metres. Survey at 1179 metres was 1°.
12th January, 1983	1269m	Drilled and under-reamed 17-1/2 inch hole from 1264 metres to 1269 metres. Prepared hole for logging and running casing. Ran one log (DIL-Sonic-MSFL-GR-SP and Caliper log). Ran and set 13-3/8 inch casing with shoe at 1262 metres. Circulated prior to cementing.
13th January, 1983	1276m	Cemented 13-3/8 inch casing at 1262 metres RKB with 825 sacks class "G" cement mixed with 2.5% pre-hydrated gel water and 0.5% CFR-2 at 12.8 PPG, followed with 500 sacks class "G" neat cement mixed at 15.6 PPG. Drilled out with a 12-1/4 inch bit and conducted formation leak-off test. Formation leaked off at an EMW of 17.8 PPG. Drilled to 1276 metres RKB.
14th January, 1983	1555m	Drilled from 1276 metres to 1555 metres RKB.
15th January, 1983	1631m	Drilled from 1555 metres to 1631 metres RKB. Survey at 1573 metres RKB showed 1/2 degree deviation.
16th January, 1983	1790m	Drilled from 1631 metres to 1790 metres RKB.
17th January, 1983	1907m	Drilled from 1790 metres to 1907 metres RKB. Lost two hours drilling time due to union mass meeting in Sale.

Date	Total Depth (metres RKB)	Work Performed
18th January, 1983	1916m	Lost 10 hours due to union mass meeting. Drilled from 1907 metres to 1916 metres RKB. Fished for twisted off bottom hole assembly.
19th January, 1983	2042m	Recovered bottom hole assembly. Drilled from 1916 metres to 2042 metres RKB.
20th January, 1983	2103m	Drilled a 12-1/4 inch hole from 2042 metres to 2103 metres.
21st January, 1983	2203m	Drilled from 2103 metres to 2203 metres (spent 9.5 hours tripping to replace a drill-collar with a cracked box).
22nd January, 1983	2234m	Drilled from 2203 metres to 2234 metres (encountered another washout in the drill-collars.).
23rd January, 1983	2455m	Drilled from 2234 metres to 2455 metres.
24th January, 1983	2666m	Drilled from 2455 metres to 2666 metres.
25th January, 1983	2898m	Drilled from 2666 metres to 2898 metres. Conditioned hole for logs.
26th January, 1983	2898m	Ran in hole with DIL/GR/SP/SLS tools. Could not get below 2549 metres. Ran in hole with bit and tagged bridge at 2869 metres. Reamed and washed to 2898 metres. Ran in hole with logging tools again. Could not get below 2878 metres. Started logging.
27th January, 1983	2898m	Logged well and shot sidewall cores. All sidewall cores were recovered. Conditioned hole for casing.

Date	Total Depth (metres RKB)	Work Performed
28th January, 1983	2898m	Ran 9-5/8 inch casing with shoe set at 2876 metres. Mixed and pumped 800 sacks of clas"G" cement mixed with 2.5% gel, 0.5% CFR-2 and 0.06% HR6-L at 12.8 PPG followed with 500 sacks of class "G" cement mixed with 0.5% CFR-2, 0.1% HR6-L and 0.8% Halad 22A mixed at 15.8 PPG. Displaced with 16.5 bbls of water and 619 bbls of mud (lost circulation after displacing with 484 bbls of mud.
29th January, 1983	2898m	Tested BOPs and casing to PAOC's specifications. Ran gyro survey from top of cement to seabed.
30th January, 1983	3003m	Drilled cement plugs, shoe joint, cement in rathole, and 3 metres of new hole to 2901 metres. Performed a formation leak-off test (EMW of 13.3 PPG). Drilled 8-1/2 inch hole from 2901 metres to 3003 metres.
31st January, 1983	3140m	Drilled 8-1/2 inch hole from 3003 metres to 3140 metres.
1st February, 1983	3155m	Cut core No. 1 from 3140 metres to 3155 metres.
2nd February, 1983	3163m	Recovered 90% of core No. 1 (13.3m) and cut core No. 2 from 3155 metres to 3163 metres.
3rd February, 1983	3261m	Recovered 83% of core No. 2. Drilled from 3163 metres to 3261 metres.
4th February, 1983	3402m	Drilled from 3261 metres to 3402 metres.

Date	Total Depth (metres RKB)	Work Performed
5th February, 1983	3540m	Drilled from 3402 metres to 3540 metres. Began conditioning hole for logs.
6th February, 1983	3540m	Ran 3 runs of logs and a velocity survey.
7th February, 1983	3540m	Ran R.F.T. and shot 51 sidewall cores (recovered 48).
8th February, 1983	2783m	Shot 51 sidewall cores (recovered 30). Set EZ-SV packer at 2846 metres (WLM). Squeeze-cemented 118 sacks of class "G" cement mixed at 15.8 PPG. Reversed circulated (no cement returns). Pumped 50 sacks on top of retainer. Tested plug to 1000 psi for 15 minutes (OK).
9th February, 1983	294m	Set a balanced plug from 365 metres to 294 metres with 84 sacks of class "G" neat cement mixed at 15.8 PPG. Reversed circulated (no cement returns). Pulled BOP and riser.
10th February, 1983	294m	Ran in hole and detonated an explosive charge 8 metres below the 16-3/4 inch wellhead. Recovered all wellhead and casing stubs. Standby boat recovered all anchor marker buoy lights. Workboats recovered piggy back anchors Nos. 6 and 7.
11th February, 1983		Workboats recovered piggyback anchors Nos. 1, 4 and 5.
12th February, 1983		Workboats recovered piggyback anchors Nos. 3 and 8 (note: a total of 14.5 hours were lost due to weather).

Date	Total Depth	Work Performed
13th February, 1983		Workboats recovered piggy back anchor No. 2 and primary anchors Nos. 1, 4, 5, 6 and 8.
14th February, 1983		Workboats recovered primary anchors Nos. 2, 3 and 7.
Final Report		Rig under tow to Hermes No. 1 location at 1520 hours on February 13th, 1983.

PE906298

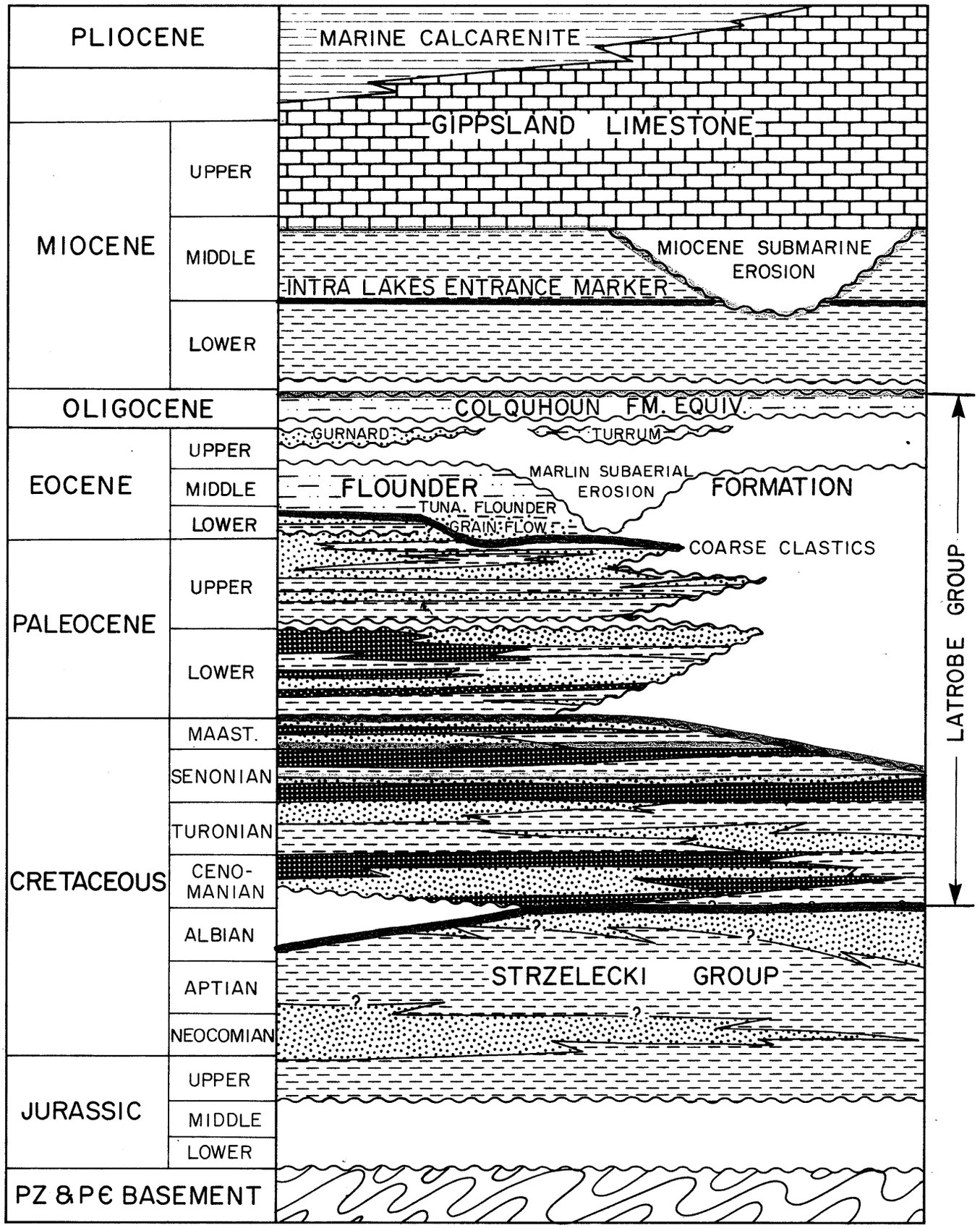
This is an enclosure indicator page.
The enclosure PE906298 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906298 has the following characteristics:

ITEM_BARCODE	= PE906298
CONTAINER_BARCODE	= PE902605
NAME	= Stratigraphic Section
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= STRAT_COLUMN
DESCRIPTION	= Stratigraphic Section of Gippsland Basin, Figure 3
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC SECTION
GIPPSLAND BASIN



SEISMIC MAPPING HORIZONS ——

A-5546

FIGURE 3

PE906299

This is an enclosure indicator page.
The enclosure PE906299 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906299 has the following characteristics:

ITEM_BARCODE	= PE906299
CONTAINER_BARCODE	= PE902605
NAME	= Structural Trends Map
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= GENERAL
SUBTYPE	= GEOL_MAP
DESCRIPTION	= Structural Trends and Location Map, Figure 4
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

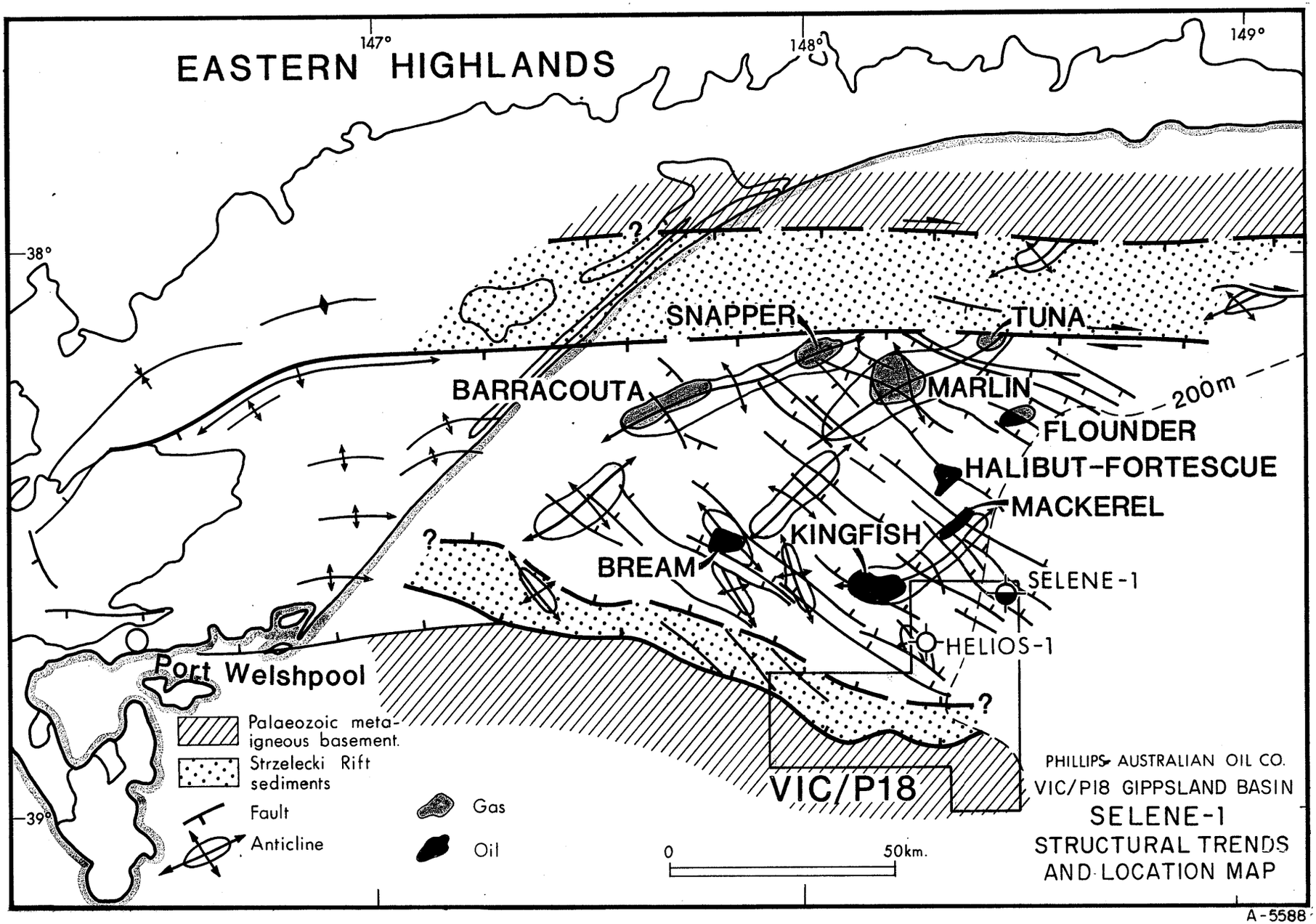


FIGURE 4

During this period, fluvial-paralic clastics and coals of the Latrobe Group were deposited in the Gippsland Basin. An unconformity and/or transgressive sequence at the top of the Late Cretaceous may be related to the onset of rifting in the Southern Ocean. An unconformity at the top of the Latrobe coarse clastic sequence is related to the breakup of Antarctica from Australia in latest Early Eocene time.

During Mid-Eocene time there was a change from divergent to convergent wrench motion along the Gippsland-Otway trend. The mechanisms of this change are not fully understood since the relative over-riding motion between Australia and Antarctica appears to be extensional. Divergent wrench motion between Tasmania and Australia at this time may, however, have been related to incipient movement along fracture zones in the Tasman Sea.

The consequences of the change from divergent to convergent wrench motion were expressed along the northern rift shoulder of the basin. A series of compressional wrench-induced anticlines developed on the northern rift shoulder at a new orientation to the pre-existing wrench anticlinal fabric. This new system developed in an eastnortheast-westsouthwest direction and largely grew where listric basin-bounding faults in the northern rift shoulder were able to move in a horizontal fashion. That is, they were reactivated to become wrench faults. Convergent wrenching has continued right up to the present day.

STRATIGRAPHY

The stratigraphic section penetrated in Selene No. 1 extends from Recent to Upper Cretaceous (Campanian) in age. Anticipated versus actual stratigraphic sections are shown in Figure 5. Formation names, lithology and ages are shown in Figure 6.

Formation tops and ages are based upon lithological, micro paleontological, and palynological studies of sidewall cores, core chips and drill cuttings, in conjuction with wireline log characteristics and correlation with the nearby Helios No. 1 and Hapuku No. 1 wells (Figures 7 and 8). Sampling commenced at 600 metres with the installation of the marine riser after setting 20-inch casing. All depths were recorded from the Rotary Kelly Bushing 23 metres above mean sea level. Ages for the Mid-to-Late Tertiary are based on micropaleontological data, whereas those for the Early Tertiary and Late Cretaceous are based on palynological (spore-pollen and dinoflagellate) data (Appendices 7 and 8).

A major hiatus exists between Late Cretaceous/Paleocene (?) and Early Eocene strata which represents the "Southern Ocean Rift Onset". This is the final rifting phase between Australia and Antarctica preceding continental breakup and sea floor spreading. The rifting created a drop in sea level causing non-deposition and/or erosion in the Selene area. Significant hiatii also exist between the early Mid-Eocene and late Mid-Eocene and the late Mid-Eocene and latest Eocene (Figure 6). These unconformities were caused by tectonic fluctuations resulting in marine transgressions and regressions all related to the continued separation of Australia from Antarctica. One final major hiatus exists between the earliest Oligocene and Early Miocene. This unconformity referred to as the "Cobia Event" (Taylor, 1983), is related to the final opening of a deep sea way between Australia and Antarctica, creating a major eustatic sea level low.

PE906300

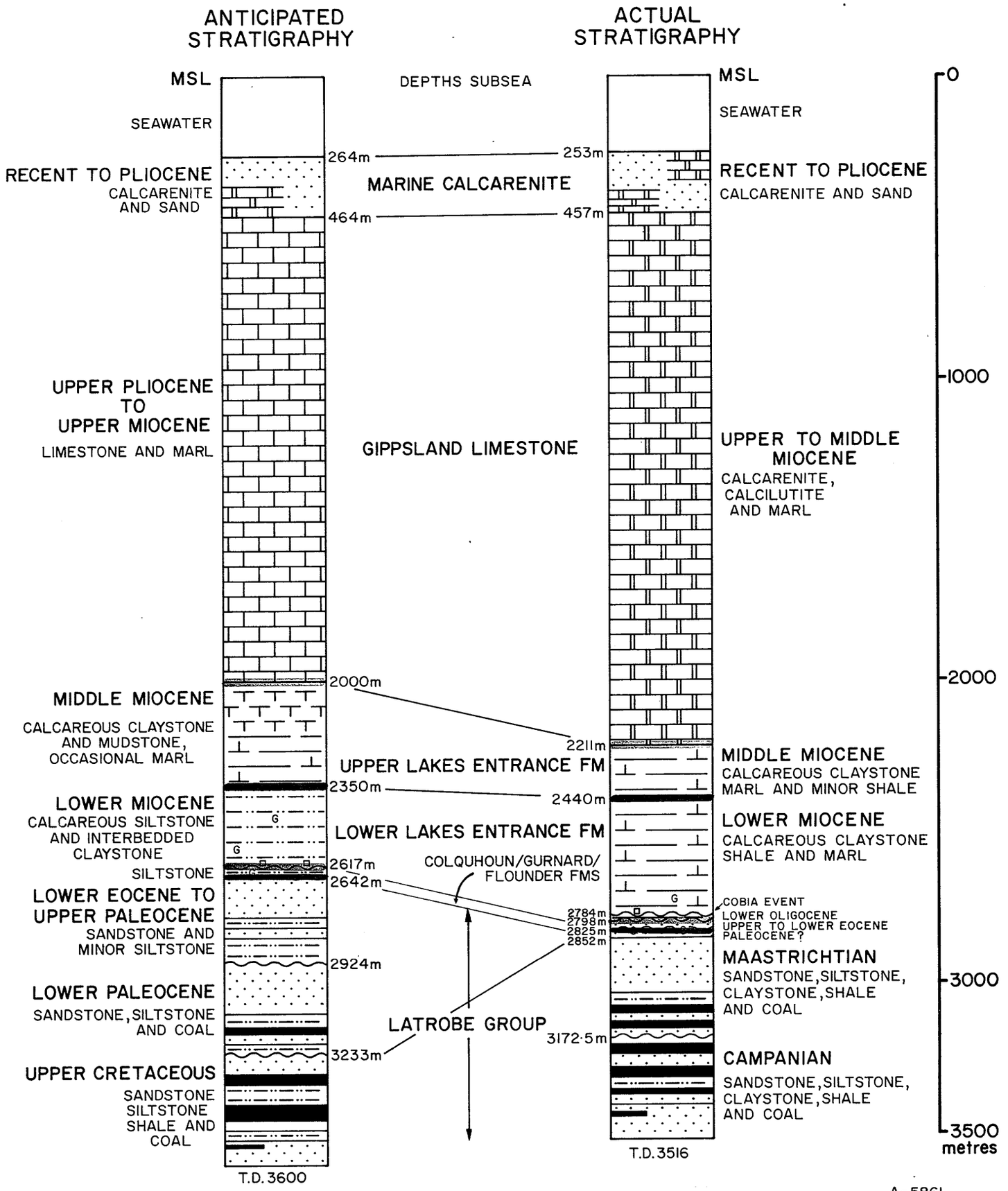
This is an enclosure indicator page.
The enclosure PE906300 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906300 has the following characteristics:

ITEM_BARCODE	= PE906300
CONTAINER_BARCODE	= PE902605
NAME	= Anticipated v Actual Stratigraphy
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Anticipated v Actual Stratigraphy for Selene-1, Figure 5
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

SELENE-1



A-5861

FIGURE 5

PE906301

This is an enclosure indicator page.
The enclosure PE906301 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906301 has the following characteristics:

ITEM_BARCODE	= PE906301
CONTAINER_BARCODE	= PE902605
NAME	= Stratigraphic Table
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Stratigraphic Table for Selene-1, Figure 6
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC TABLE - SELENE-1

AGE	PERIOD	EPOCH / SERIES		MILLION YEARS	FORMATION OR FORMATION EQUIV.	LITHOLOGY	METRES (BELOW R.K.B.)	THICKNESS (m)
CENOZOIC	QUATERNARY	PLEISTOCENE / HOLOCENE		1·8				
	TERTIARY / NEOGENE	PLIOCENE	LATE	3·5	UNNAMED MARINE CALCARENITE	SAND AND CALCARENITE		227
			EARLY	5			480	
		MIOCENE	LATE		GIPPSLAND LIMESTONE	CALCARENITE CALCILUTITE AND MARL		1754
			MIDDLE	11			2234	
			EARLY	15	LAKES ENTRANCE FM	CALCAREOUS CLAYSTONE SHALE AND MARL		573
	TERTIARY / PALEOGENE	OLIGOCENE	LATE	23		"COBIA EVENT" 12 m.y.	2807	
			EARLY	33	LAKES ENTRANCE FM.	CLAYSTONE	2807	14
		EOCENE	LATE	38	COLQUHOUN FORMATION	CLAYSTONE	2821	1·5
					LATROBE GROUP	2 m.y.	2822·5	
					GURNARD FORMATION	MUDSTONE AND SANDSTONE	2822·5	16·5
			MIDDLE	43·5	LATROBE GROUP	7 m.y.	2839	
			EARLY	49·5	FLOUNDER FORMATION	SANDSTONE	2839	9
		PALEOCENE	LATE	55		12 m.y.	2848	
			EARLY	58				
MESOZOIC	UPPER CRETACEOUS	MAASTRICHTIAN		65	LATROBE GROUP ? ?	SANDSTONE	2875	27
		CAMPANIAN		69	LATROBE CLASTICS	? ? SANDSTONE, SILTSTONE, CLAYSTONE, SHALE AND COAL	? 3195·5	? 320·5
		SANTONIAN		77			T.D. 3539	343·5
		CONIACIAN		83				
				88				

A-5852

FIGURE 6

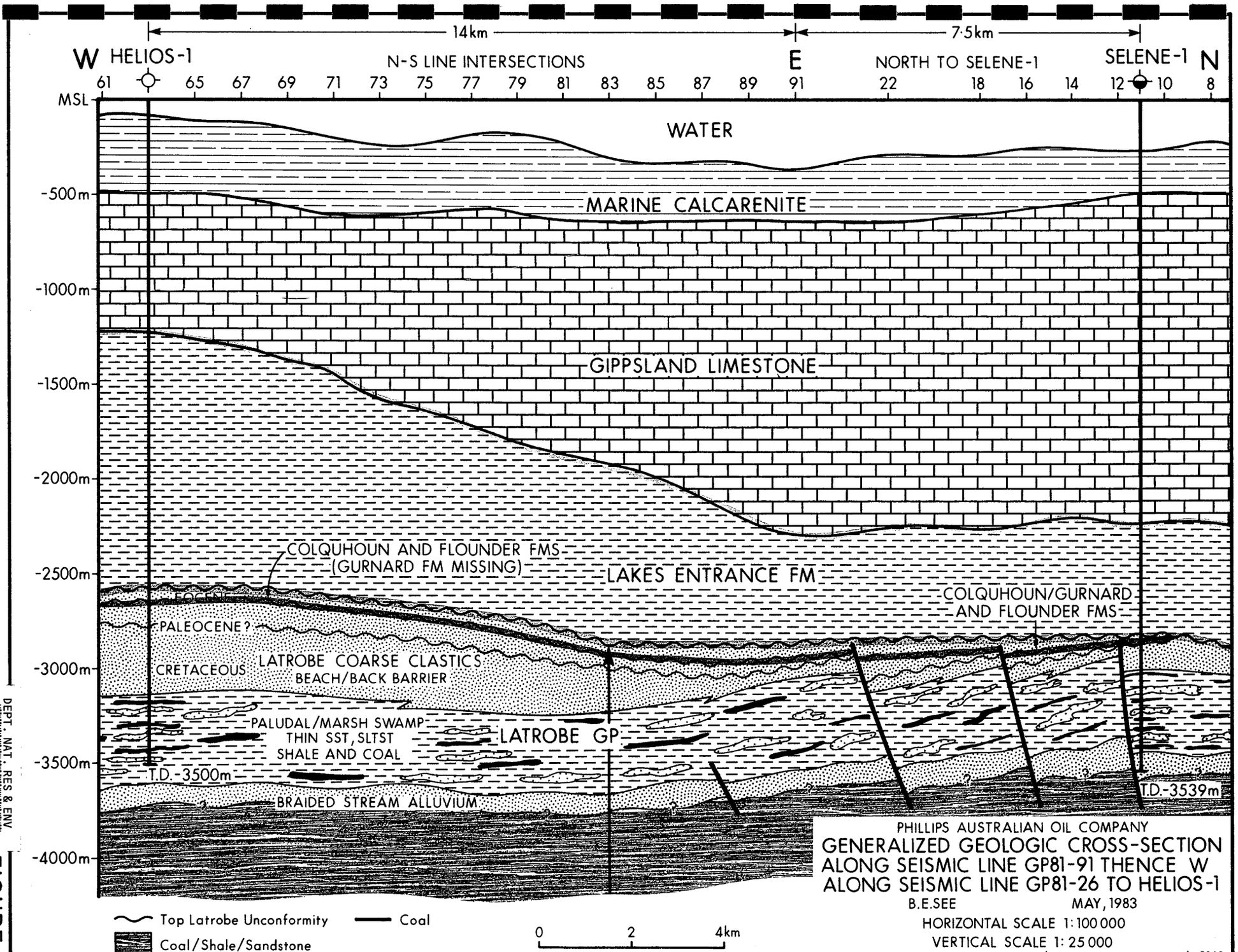
PE906302

This is an enclosure indicator page.
The enclosure PE906302 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906302 has the following characteristics:

ITEM_BARCODE	= PE906302
CONTAINER_BARCODE	= PE902605
NAME	= Generalized Cross-Section 1
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Cross-section along Seismic Line GP81-91 and GP81-26, containing Selene-1 and Helios-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)



PHILLIPS AUSTRALIAN OIL COMPANY

GENERALIZED GEOLOGIC CROSS-SECTION ALONG SEISMIC LINE GP81-91 THENCE W ALONG SEISMIC LINE GP81-26 TO HELIOS-1

B.E.SEE MAY, 1983

HORIZONTAL SCALE 1:100 000

VERTICAL SCALE 1: 25 000

A-5869

FIGURE 7

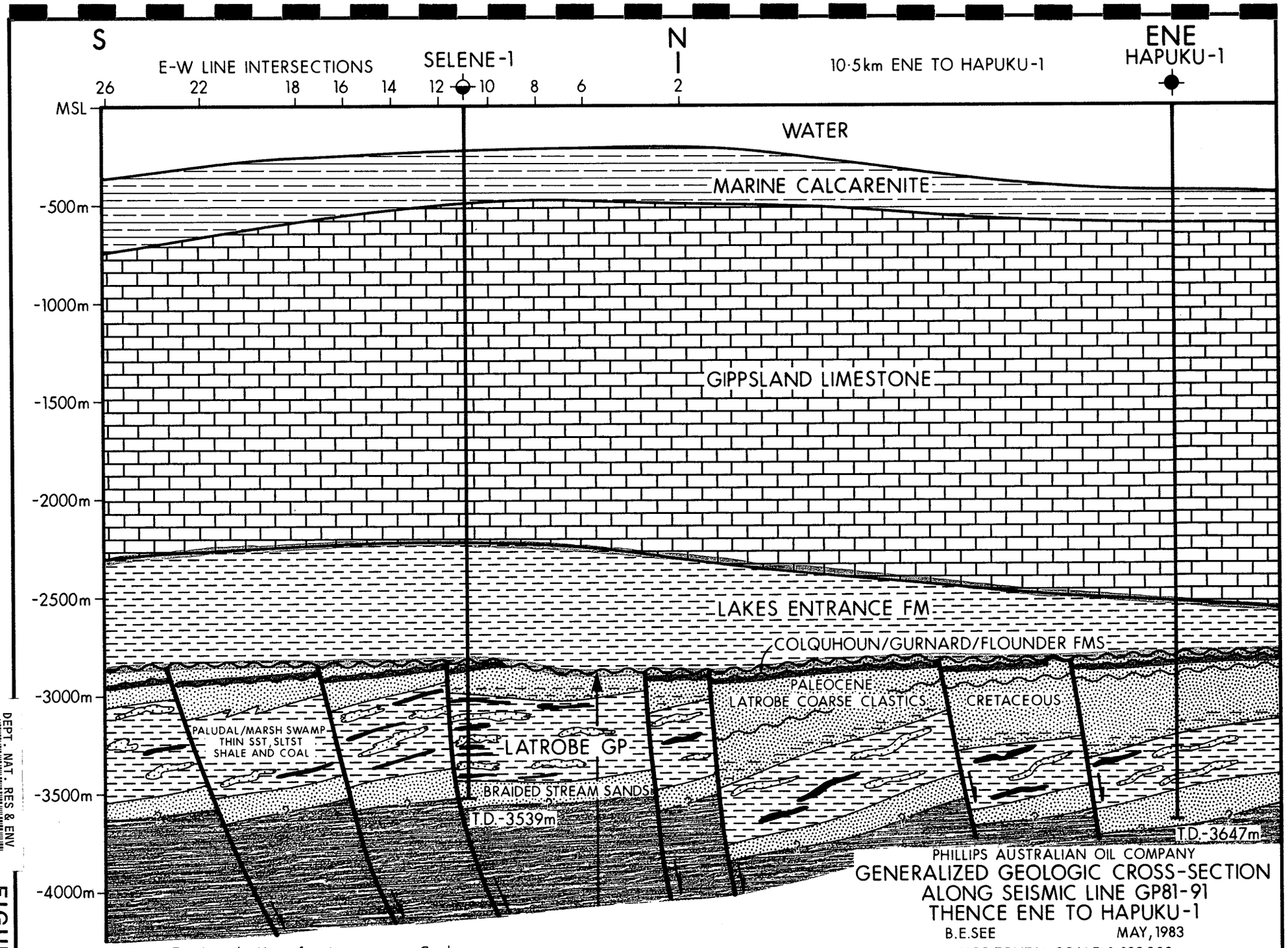
PE906303

This is an enclosure indicator page.
The enclosure PE906303 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906303 has the following characteristics:

ITEM_BARCODE	= PE906303
CONTAINER_BARCODE	= PE902605
NAME	= Generalized Cross-Section 2
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Cross-section along Seismic Line GP81-91 containing Selene-1 and Hapuku-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)



PHILLIPS AUSTRALIAN OIL COMPANY

GENERALIZED GEOLOGIC CROSS-SECTION
ALONG SEISMIC LINE GP81-91
THENCE ENE TO HAPUKU-1

B.E.SEE MAY, 1983

HORIZONTAL SCALE 1:100 000
VERTICAL SCALE 1: 25 000

A-5867

FIGURE 8

Brief descriptions of the stratigraphic units penetrated are presented below. Detailed lithologic descriptions of cuttings, sidewall cores and conventional cores are given in Appendices 3, 4 and 5 respectively, and also on the Geologist's Litholog (Enclosure 3) and Geoservices Mud Log (Enclosure 2). A detailed summary of final stratigraphic interpretations for Selene No. 1 is presented on the Well Composite Log (Enclosure 4). Petrographic descriptions of sediments from the Upper Cretaceous sequence are presented in Appendix 6.

Tertiary

Late-to-Middle Miocene : Gippsland Limestone
600m - 2234m (1634m)

This unit consists of calcarenite, calcilutite and marl and lithologically can be divided into three units.

The uppermost unit consists of calcarenite, white to light grey to dark grey, homogeneous, soft to moderately hard, sticky with moderately abundant microfossils and occasional fine-grained clear quartz from 600 metres to 1268 metres. Calcilutite, light-to-dark grey, homogeneous with rare quartz grains replaces calcarenite as the carbonate type from 1268 metres to 1647 metres. Both the calcarenite and calcilutite are interbedded with marl, grey, soft, sticky. Calcarenite is the predominant carbonate type in the lower unit from 1647 metres to 2234 metres where it is interbedded with calcareous claystone and shale.

The carbonate depositional environment indicates continual shallowing of water depths due to sediment infilling up-section.

The upper section from 600 metres to 1740 metres was deposited near the shelf edge, with deposition occurring in a water depth of approximately 200 metres at the base gradually shallowing at the top of the sequence. The depositional environment below 1740 metres was upper slope with water depths of 200 metres - 400 metres. Slumping occurs at the base of the interval at 2234 metres.

Resistivity and sonic-transit time shift to the left at 2234 metres indicating the base of the Gippsland Limestone.

Earliest Oligocene to Mid-Miocene : Lakes Entrance Formation
2234m - 2821m (587m)

This sequence consisting of fine-grained clastics can be separated into three lithologic divisions.

The uppermost unit from 2234 metres to 2463 metres is a moderately firm-to-firm, medium grey, homogeneous claystone interbedded with marl and minor shale and has a sharp contact with the overlying Gippsland Limestone. From 2463 metres to 2807 metres the dominant lithology is shale, medium-to-dark grey to olive, firm to moderately hard, calcareous with interbedded light-to-medium grey to greenish grey, soft to moderately hard, calcareous claystone. In the lowermost unit from 2807 metres to 2821 metres the dominant lithology is claystone, partly silty with abundant glauconite.

Deposition of the sequence 2234 metres to 2807 metres occurred on the upper part of the continental shelf in estimated water depths of between 200 metres and 400 metres. From 2807 metres to 2821 metres paleodepth decreased from approximately 200 metres to 100 metres with deposition occurring in a high-energy shelfal environment.

A hiatus of approximately 12 million years separates the earliest Oligocene from the Early Miocene. This hiatus was caused by the marine regression of the "Cobia Event" which resulted in erosion and/or non-deposition of all the Mid-to-Late Oligocene section.

This sequence is characterized on electric logs by an abrupt decrease in resistivity and increase in sonic transit time and gamma-ray readings at the upper contact. Resistivity decreases and interval transit time increases gradually in the uppermost unit. The middle unit has resistivities of about one ohm and interval transit times of 90 microseconds per foot with a minor serrated appearance. Slightly lower resistivity and higher sonic-transit time along with decrease in density log shifts at 2807 metres mark the "Cobia Event" unconformity.

Late Eocene : Latrobe Group - Colquhoun Formation
2821m - 2822.5m (1.5m)

The Colquhoun Formation is a medium-grey claystone, homogeneous, calcareous, abundant glauconite, silty in part and is difficult to differentiate lithologically from the overlying Lakes Entrance Formation. The environment of deposition was intra-tidal in water depths of less than 10 metres. Changes in electric log character (see Composite Log Enclosure 4) at 2821 metres corresponds to the paleoenvironmental changes from the Late Eocene littoral fauna at 2822 metres to the Early Oligocene shelfal fauna from 2820 metres to 2810 metres (see Paleo Report, Appendix 7). Therefore, the wireline log resistivity peak and sonic interval transit time decrease over the interval from 2821 metres to 2822.5 metres is considered to be representative of the Colquhoun Formation.

Late Middle Eocene : Latrobe Group - Gurnard Formation
2822.5m - 2839m (16.5m)

The Gurnard Formation consists of a minor mudstone interval at the top of the sequence followed by dark grey to greenish grey, medium-to-very coarse grained sandstone with a silty-to-very clayey matrix containing abundant glauconite and pyrite.

A 2 million year hiatus separates the Gurnard Formation from the overlying Colquhoun Formation. Gurnard sedimentation took place in a lagoonal/intertidal situation near the entrance of an estuarine system entering a shallow platform continental shelf sea.

The top of this formation faces just below the elecric log peak (2822.5 metres) which marks the overlying Colquhoun Formation. The formation is also indicated on electric logs by an increase in resistivity and decrease in sonic-transit time.

Lower(?)-To-Early Middle Eocene : Latrobe Group - Flounder Formation
2839m - 2848m (9m)

Sediments of the Flounder Formation include dark grey to greenish grey, medium-to-very coarse grained sandstone, angular to subround, poorly sorted, very silty/clayey matrix, abundant glauconite and pyrite with minor interbedded claystone and siltstone.

The dominant sediment grains (sand >.075mm) in this interval are pitted, frosted and/or impact-fractured quartz grains. These features were probably caused by eolian processes. Paleo-soil horizons are indicated by limonitic clays. Paleontological studies indicate marine ingressions into marginal marine environments. The distribution of glauconite and biogenic pyrite increases upward from 2848 metres to 2839 metres. These observations indicate that sedimentation took place within a barrier/dune/estuarine regime analogous to that of the present day Gippsland Lakes-Ninety Mile Beach system of southeastern Victoria (Taylor, 1983).

A resistivity peak on wireline logs at 2839 metres along with paleontological evidence indicate a hiatus with an estimated time span of 7 million years. Resistivity within the Flounder Formation decreases down section while the sonic log is a series of two high and low spikes. This formation has a high density in relation to overlying and underlying formations. The gamma-ray log increases downward in response to increase in glauconite.

Cretaceous

Maastrichtian to Early Paleocene (?): Latrobe Group - Latrobe Clastics 2848m - 2986m (138 m)

The Paleocene (?) is inserted here under the heading Cretaceous because of a problematical zone between 2848 metres and 2875 metres. Beginning at 2848 metres is a transition zone between the T. longus and L. balmei spore-pollen zones. This transition normally signals a change from Maastrichtian to Paleocene but in Selene No. 1 this zone was at the 9-5/8-inch casing point and possible contamination from drilling mud of sidewall cores may have decreased the reliabiity of age determination. Two sidewall cores taken at the same depth give different age results. Wireline logs indicate little change at this level. The zone 2848 metres to 2875 metres is therefore considered to be a transition zone from the Late Cretaceous to Early Tertiary and may include the Early Paleocene.

The lithology for the most part is sandstone, white-to-light grey to dark grey, fine-to-very coarse grained to pebbly, poorly sorted, angular to round, poorly cemented, generally clean, glauconitic at the top becoming less glauconitic with depth, pyritic in part. Minor dark grey to dark brown, sandy, calcareous siltstone occurs occasionally down to approximately 2937 metres.

The environment of deposition of this sand-dominated section changes with depth. From 2848 metres down to approximately 2925 metres the section is marine dominated. Sedimentation occurred in very shallow water, probably as offshore and barrier bars which were reworked from time to time. At approximately 2925 metres the environment changes to lagoonal/back-bar and remains so until approximately 2937 metres. Beginning at 2938 metres and continuing down to 2986 metres sedimentation occurred as a barrier island/beach strand line system. The sands of this system are relatively immature indicating close proximity to source area. Some of the sand grains are angular on one side and round on the other indicating reworking. Deposition occurred mainly on a short steep shoreface slope resulting in poorly sorted, massive sands similar to grain flow sands. Iron oxide staining, in part, indicates subaerial exposure with deposition occurring on beaches or dunes.

An unconformity, based on lower resistivity, a slight increase in gamma-ray readings and an increase in neutron-density porosity, is placed at 2848 metres and establishes the base of the Eocene sediments. Paleontological and palynological data also support an unconformity at this level (Appendices 7 and 8).

Resistivity within the water wet sands of the Latrobe clastics is much lower than in the overlying silty formations. The sonic log indicates a higher interval transit time which corresponds to increased porosity. Gamma-ray readings remain high in the interval due to glauconite in the formation except in the lower sand which is relatively free of glauconite and carbonaceous material.

Campanian to Maastrichtian : Latrobe Group - Back Barrier/Paludal Swamp Sediments
2986m - 3436m (450 m)

The lithology of this interval is interbedded sandstone, siltstone, claystone, shale and coal. The sandstones are generally white to dark grey, fine-to-medium grained, occasionally coarse to pebbly, poor-to-moderately well sorted, poorly cemented, very silty in part, very carbonaceous in part.

Siltstones are grey to dark brown, firm to hard, occasionally soft, sandy in part, usually very carbonaceous. The claystones are dark brown, massive, moderately hard, silty to sandy in part, very carbonaceous. The shale interbeds are brown to black, firm to hard, occasionally silty, pyritic, very carbonaceous to coaly. Coals are black, hard, vitreous, blocky and pyritic.

The environment of deposition of this sequence also changes with depth. A lagoonal sequence extends from 2986 metres to 3029.5 metres. This lagoonal sequence was generally fresh-water dominated but had marine incursions which caused fluctuations in salinity. Beginning at 3029.5 metres the environment of deposition was paludal swamp. The sequence is a series of overbank and swamp deposits bisected by tidally-influenced meandering creeks and small streams. Sandstone deposition occurred as small point bars in these creeks and streams which emptied into back barrier, mainly fresh water lagoons. This repetitive sequence continues downward to approximately 3436 metres.

The top of this sequence is indicated by peaks on the resistivity, sonic density and neutron logs. The gamma-ray also indicates a shift from the massive sands to an interbedded sequence. The sonic log indicates a gradual decrease in interval transit time with little difference between sandstone and shale with the exception of a few tightly cemented sandstones. Coals and carbonaceous shales are indicated by high interval transit times (see Composite Log, Enclosure 4). The top of the Campanian is picked at 3195.5 metres based on palynological data (Appendix 8).

Campanian : Latrobe Group - Braided Stream Alluvium
3436m - 3539m T.D. (103 m)

The boundary between this unit and the overlying sediments is not distinct lithologically. At approximately 3436 metres the major interbedded sandstones, siltstones, claystones, shales and coals give way to a dominantly sandy section with minor interbedded claystone, shale and coal. The sandstone is light-to-dark grey, fine-to-coarse grained to pebbly, poorly sorted, silty in part, carbonaceous in part.

The environment of deposition is interpreted to be upper delta/braided stream. From 3400 metres to 3436 metres there is a zone of transition from paludal swamp to upper delta/braided stream. These deposits are mainly levee and overbank sediments with minor backswamp coals. Below 3436 metres the sequence is dominated by coarse grained braided- stream alluvium with occasional intermixed swamp coals and silt bar islands.

The sedimentology of the Latrobe Group sediments penetrated in Selene No. 1 is indicative of an overall marine transgression. In a normal prograding delta, marine sediments are overlain by lower delta plain sediments which in turn are overlain by upper delta plain and fluvial deposits. The opposite is true in Selene No. 1. This "inverted delta" sequence depicts a fluvial system with a dominantly sandy discharge flowing into a sea which was, for the most part, constantly rising and transgressive landwards. This resulted in deposition of marine sediments overlying lower delta plain deposits and lower delta plain sediments overlying upper delta plain/fluvial deposits.

Shale resistivities in this interval are three to five ohms while the water wet sands are 0.6 to one ohm. Dolomite cemented sandstones in the lower five metres are highly resistive. The gamma-ray log indicates that the sands are relatively clean. The sonic-transit time indicates only minor differences between the sands and shale, with carbonaceous shale and coal indicated by increased sonic-transit times. Major density differences were noted between sands and shales with increased density in shales and well-cemented sandstones.

WELL CORRELATION

A comparison of the stratigraphy of Selene No. 1 with that of Helios No. 1 and Hapuku No. 1 is given in Figure 9 and Table 8. Hapuku No. 1 is the closest well to the Selene No. 1 location, being located 12.8 kilometres to the northeast. The closest offshore well in Vic/P18 is Helios No. 1, located 15.7 kilometres to the southwest.

A number of stratigraphic differences between the three wells are evident, although most of the units penetrated in Selene No. 1 occur in the other two wells. These differences are:

a) The Gippsland Limestone and overlying sediments are significantly thicker in Hapuku No. 1 (2146.5 metres) and Selene No. 1 (1981 metres) than in Helios No. 1 (1245 metres). This is related to regional tilting, presumed to be associated with Australian continental breakup from Antarctica, which caused relative subsidence in the northeast of the permit area (in the vicinity of Selene No. 1 and Hapuku No. 1) and uplift in the Helios No. 1 area to the southwest.

b) The Lakes Entrance Formation is significantly thicker in Helios No. 1 (1248 metres) than in Selene No. 1 (587 metres) and Hapuku No. 1 (269.5 metres). This is again considered to be related to regional tilting associated with the Australia and Antarctica continental breakup which caused uplift in the Hapuku and Selene areas (northeast permit area) and subsidence in the Helios area (southwest permit area). The majority of the tilting occurred before or during deposition of the Upper Lakes Entrance Formation of Middle Miocene age.

PE906304

This is an enclosure indicator page.
The enclosure PE906304 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906304 has the following characteristics:

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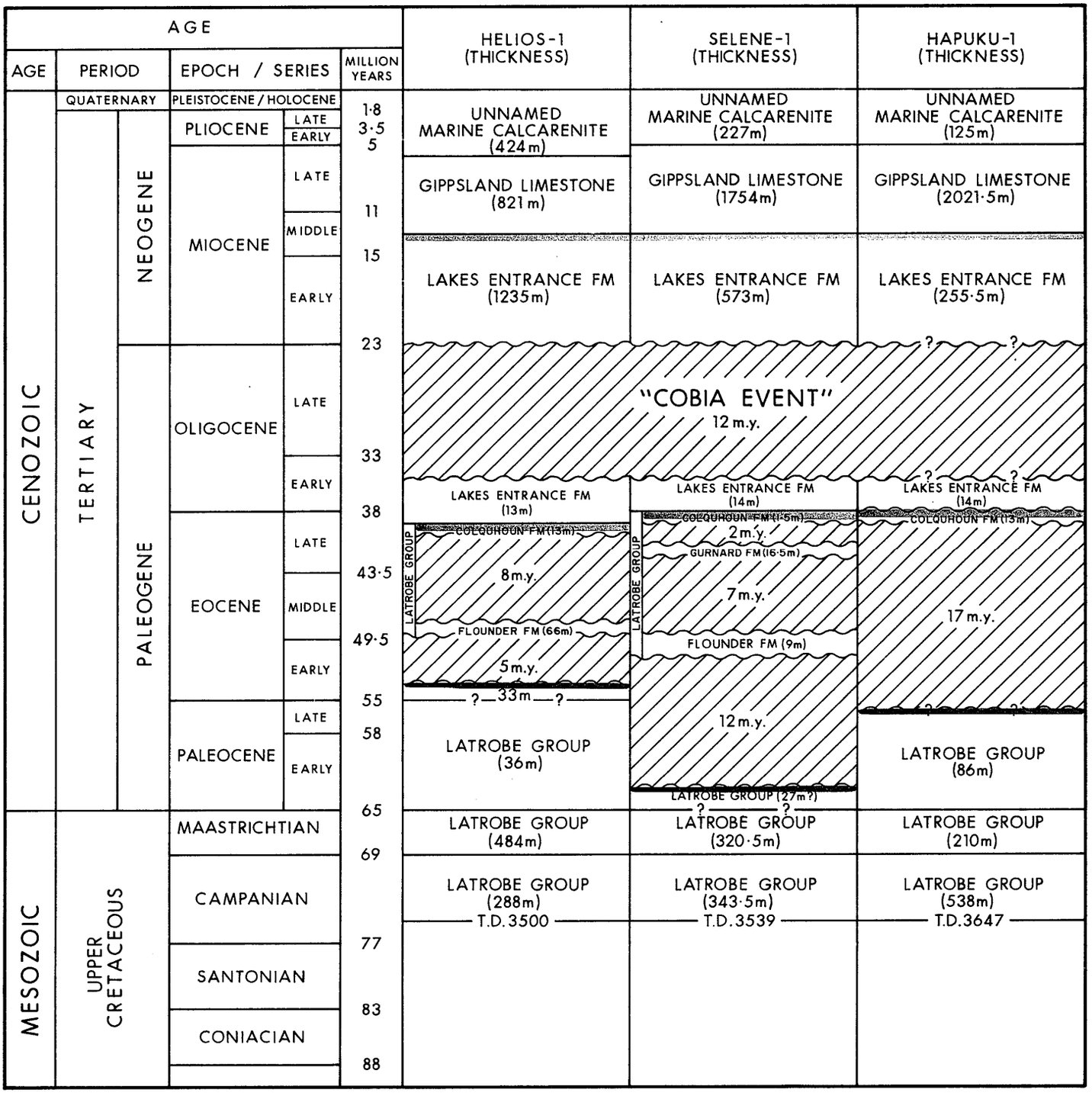
CONTAINER_BARCODE	= PE902605
NAME	= Stratigraphic Comparison
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Stratigraphic Comparison between Helios-1, Selene-1 and Hapuku-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

STRATIGRAPHIC COMPARISON: HELIOS-1, SELENE-1, HAPUKU-1



A-5853

FIGURE 9

TABLE 8 : CORRELATION WITH HELIOS NO. 1 AND HAPUKU NO. 1

HORIZON TOPS	SELENE NO. 1	HELIOS NO. 1	HAPUKU NO. 1
	DEPTH (M)	DEPTH (M)	DEPTH (M)
Marine Calcarenite	253 metres	87 metres	384 metres
Gippsland Limestone	480 metres	511 metres	509 metres
Upper Lakes Entrance	2234 metres	1332 metres	2530.5 metres
Intra Lakes Entrance	2463 metres	2142 metres	2640.5 metres
Colquhoun	2821 metres	2580 metres	2800 metres
Gurnard	2822.5 metres	Gurnard Formation Not Present	Data Not Available To Determine if Gurnard and Flounder Formation Present
Flounder	2839 metres	2593 metres	
Latrobe Clastics	2848 metrs	2659 metres	2813 metres
Maastrichtian	2875 metres	2728 metres	2899 metres
Campanian	3195.5 metres	3212 metres	3109 metres

c) Sediments of the condensed section (Colquhoun, Gurnard and Flounder Formations) at the top of the Latrobe Group are thicker in Helios No. 1 (79 metres) than in Selene No. 1 (27 metres) and Hapuku No. 1 (13 metres). This situation was created by major uplift to the northeast of the permit area along a northwest-southeasterly trend during the Late Eocene to Early Oligocene. This uplift caused less sediment to be deposited at Selene No. 1 and Hapuku No. 1 which were on the flanks of the uplifted area. A major embayment formed to the southwest of this uplift, over a major portion of the permit area. The subsequent result was a shallow trough filled with estuarine sediments deposited during minor marine incursions. Helios No. 1 was centrally located within this trough.

d) All three wells have excellent reservoir sands beneath the condensed sequences at the top of the Latrobe Group.

e) All three wells have thick paludal swamp deposits of Upper Cretaceous age.

f) Only Hapuku No. 1 and Selene No. 1 terminate in Campanian braided-stream sediments. Helios No. 1 terminates in Campanian paludal swamp sediments.

SEISMIC MARKER IDENTIFICATION

A well velocity survey was conducted at Selene No. 1 on completion of drilling (Addendum 3). From the well velocity log, the main seismic mapping horizons have been related to the stratigraphy of Selene No. 1 as shown below, and in Enclosures 4 and 5. The depths to the seismic horizons are generally greater than the predicted depth down to the Top Latrobe coarse clastics.

Seismic Horizon	Two-Way Time (Secs)	Depth	Predrill Depth Estimate
Base Gippsland Limestone Top Lakes Entrance Fm.	1.610	2234m (-2211m)	-2000m
Intra Lakes Entrance	1.762	2463m (-2440m)	-2350m
Top Latrobe Group	2.008	2821m (-2798m)	-2617m
Top Latrobe Coarse Clastics	2.020	2848m (-2825m)	-2642m
Top Cretaceous	2.035	2875m (-2852m)	-2924m (Near Top Ku)
Top Campanian	2.280	3195.5m (-3172.5m)	-3233m (Within Upper Ku)

STRUCTURE

Two-way seismic time mapping in the Selene area defined a structural anomaly within the upper portion of the Latrobe Group (Figure 10). This "Near Top Cretaceous" anomaly was originally identified as being of possible Lower Paleocene age. The anomaly did not persist at depth and the deeper "Within Upper Cretaceous" mapping horizon, originally identified as being near the top of the Cretaceous, lacked structural closure in the area of shallow anomaly (Figure 11). The Top Latrobe mapping horizon (Figure 12) also demonstrated a lack of closure in time, although a significant structural nosing or drape was developed over the underlying anomaly.

Because of lateral changes in seismic velocities in the overlying Gippsland Limestone and also rapidly-increasing water depth eastwards across the Selene area, two of the above time maps were converted to depth using smoothed stacking velocities. These were the "Top Latrobe" and "Near Top Cretaceous" maps.

Depth conversion considerably enlarged the size of the primary intra-Latrobe anomaly (Figure 13), and a dip-closed area of 15.5 square kilometres was defined with vertical closure of 180 metres. The anomaly was thought to have developed on the downthrown side of a northwest-southeast trending growth fault. Movement along the fault contemporaneous with deposition was indicated by southwest dip into the fault. The strong seismic character which defined the apparent anomaly was not developed to the southwest across the fault, and had limited lateral extent beyond the main structural anomaly (Figures 14 and 15). This marked change in seismic character was regarded as being representative of a significant facies change or lateral shaleout. The mapped extent of an interpreted sand body as defined by this seismic character change covered an area of 42.7 square kilometres. This limit is shown on Figures 10 and 13.

PE906305

This is an enclosure indicator page.
The enclosure PE906305 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906305 has the following characteristics:

ITEM_BARCODE	= PE906305
CONTAINER_BARCODE	= PE902605
NAME	= Structure Map- Near Top Cretaceous
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= SEISMIC
SUBTYPE	= HRZN_CONTR_MAP
DESCRIPTION	= Structure Map of Horizon Near Top of Cretaceous, Figure 10
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

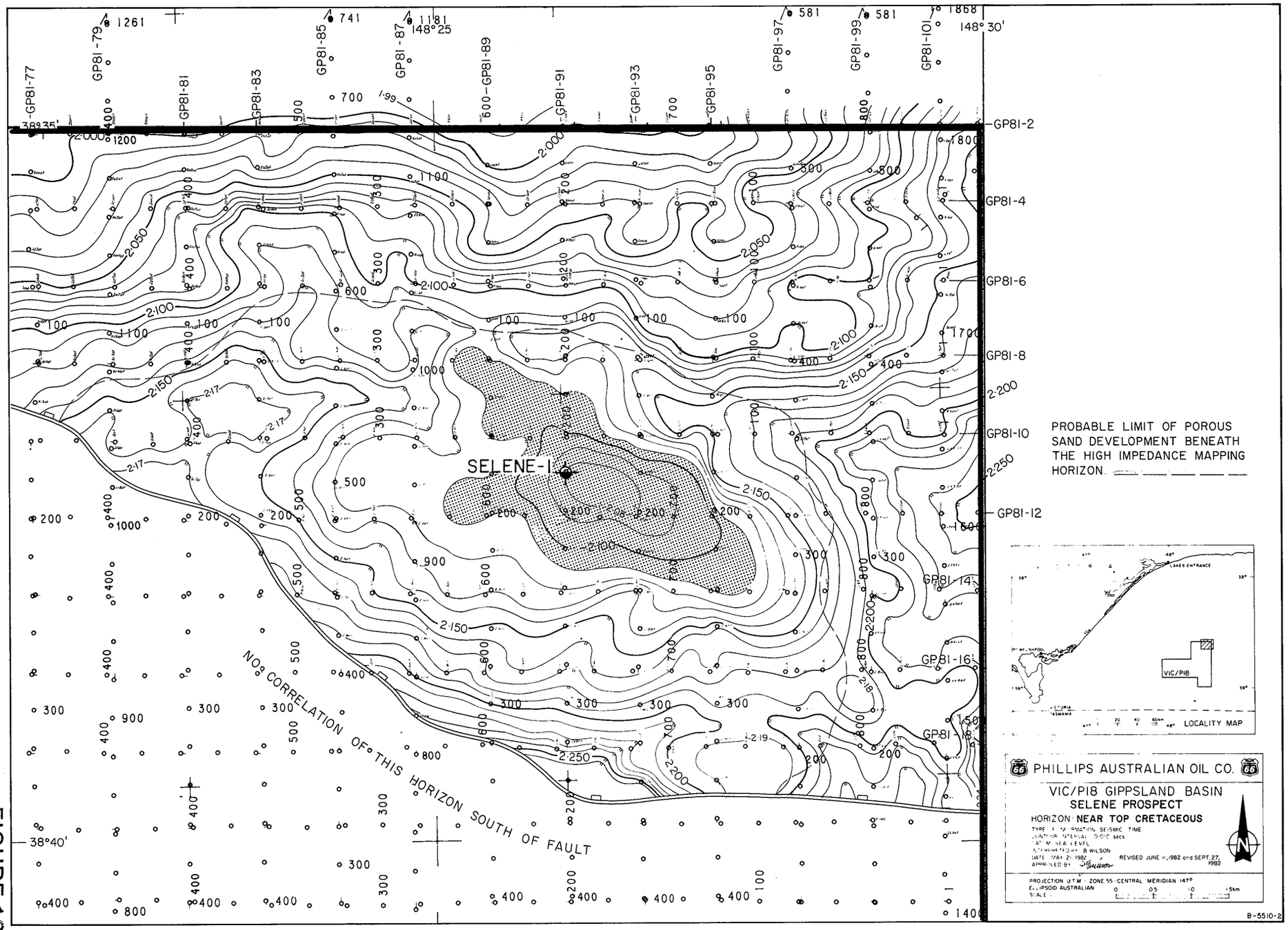


FIGURE 10

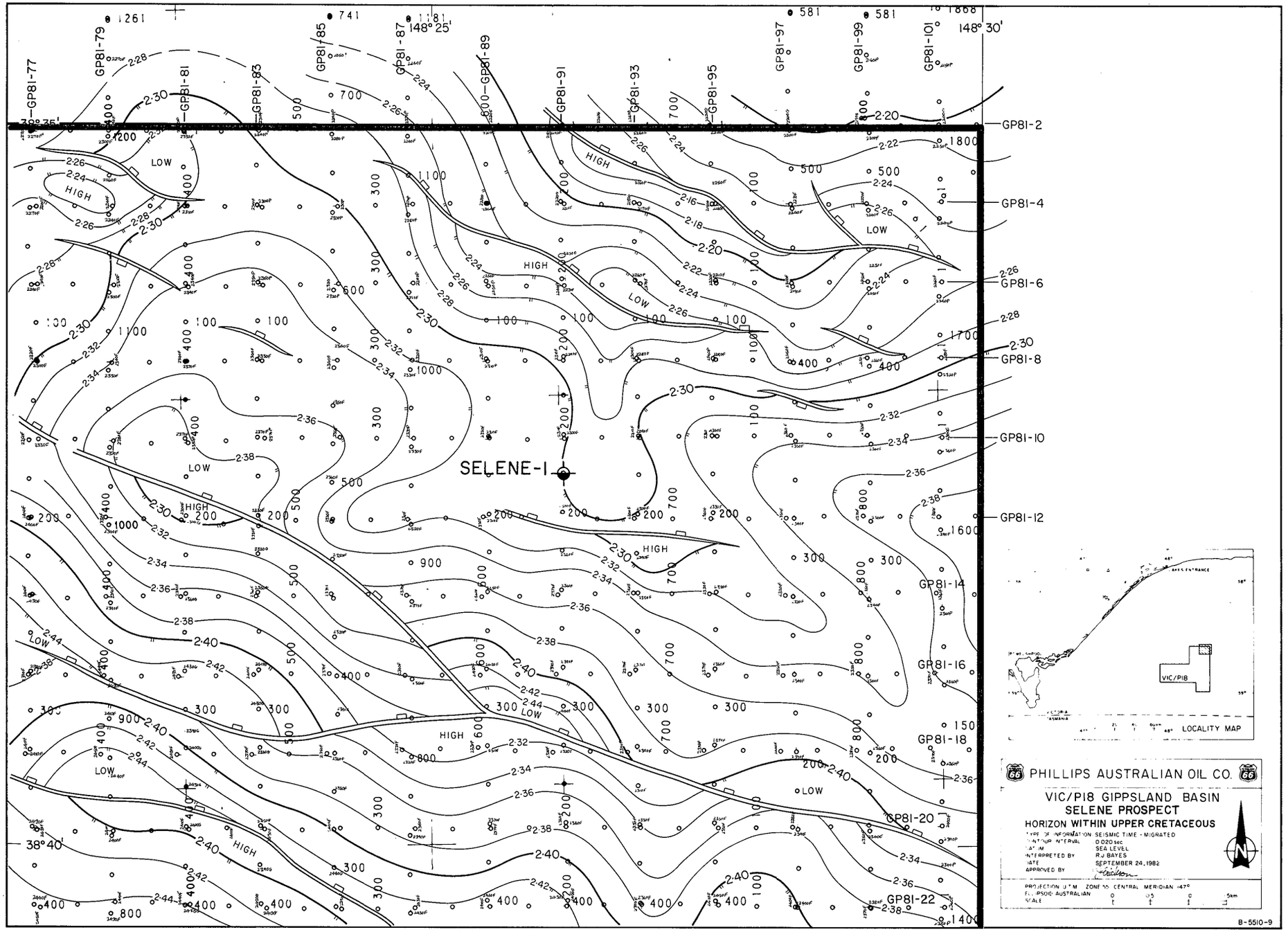
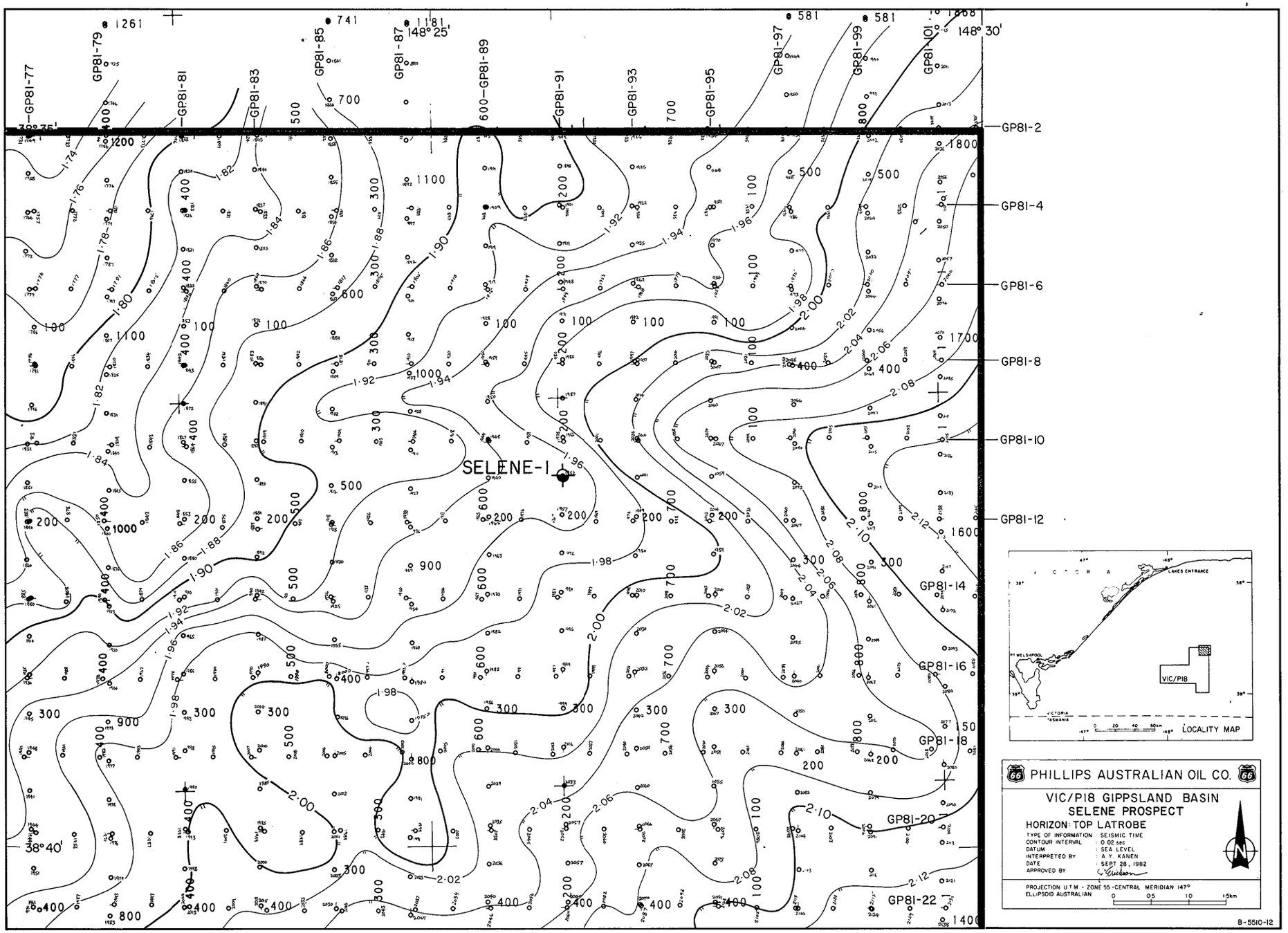

GP81-77
GP81-79
GP81-81
GP81-83
GP81-85
GP81-87
GP81-89
GP81-91
GP81-93
GP81-95
GP81-97
GP81-99
GP81-101
148° 25'
148° 30'
38° 40'
GP81-2
GP81-4
GP81-6
GP81-8
GP81-10
GP81-12
GP81-14
GP81-16
GP81-18
GP81-20
GP81-22
SELENE-1
HIGH
LOW
LOCALITY MAP
VIC/P18
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
SELENE PROSPECT
HORIZON WITHIN UPPER CRETACEOUS
TYPE OF INFORMATION SEISMIC TIME - MIGRATED
CONTOUR INTERVAL 0.020 sec
DATUM SEA LEVEL
INTERPRETED BY R.J. BAYES
DATE SEPTEMBER 24, 1982
APPROVED BY
PROJECTION U.T.M. ZONE 55 CENTRAL MERIDIAN 147°
ELLIPSOID AUSTRALIAN
SCALE
B-5510-9

FIGURE 11


148° 25'
148° 30'
38° 35'
38° 40'
GP81-77
GP81-79
GP81-81
GP81-83
GP81-85
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GP81-4
GP81-6
GP81-8
GP81-10
GP81-12
GP81-14
GP81-16
GP81-18
GP81-20
GP81-22
SELENE-1
LAKES ENTRANCE
PT WELSHPOOL
VIC/P18
LOCALITY MAP
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
SELENE PROSPECT
HORIZON: TOP LATROBE
TYPE OF INFORMATION : SEISMIC TIME
CONTOUR INTERVAL : 0.02 sec
DATUM : SEA LEVEL
INTERPRETED BY : A.Y. KANEN
DATE : SEPT 28, 1982
APPROVED BY
PROJECTION U.T.M. - ZONE 55 - CENTRAL MERIDIAN 147°
ELLIPSOID AUSTRALIAN
B-5510-12

FIGURE 12

PE906306

This is an enclosure indicator page.
The enclosure PE906306 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906306 has the following characteristics:

ITEM_BARCODE	= PE906306
CONTAINER_BARCODE	= PE902605
NAME	= Structure Map- Near Top Cretaceous
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= SEISMIC
SUBTYPE	= HRZN_CONTR_MAP
DESCRIPTION	= Structure Map of Horizon Near Top of Cretaceous, Figure 13
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

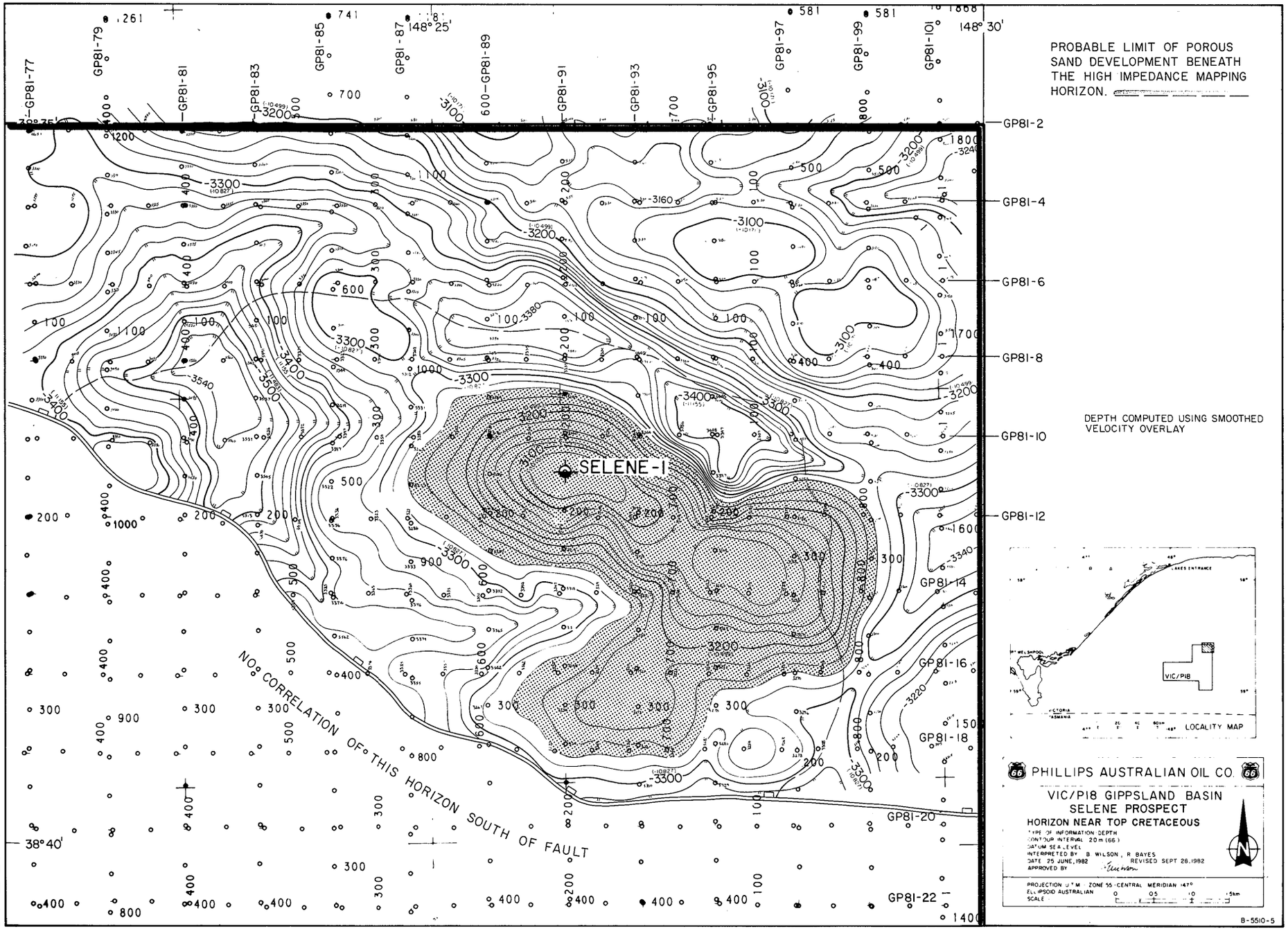


FIGURE 13

PE906307

This is an enclosure indicator page.
The enclosure PE906307 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906307 has the following characteristics:

ITEM_BARCODE	= PE906307
CONTAINER_BARCODE	= PE902605
NAME	= Seismic Line GP81-12
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= SEISMIC
SUBTYPE	= SECTION
DESCRIPTION	= Interpreted Seismic Section of Line GP81-12, containing Selene-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

W

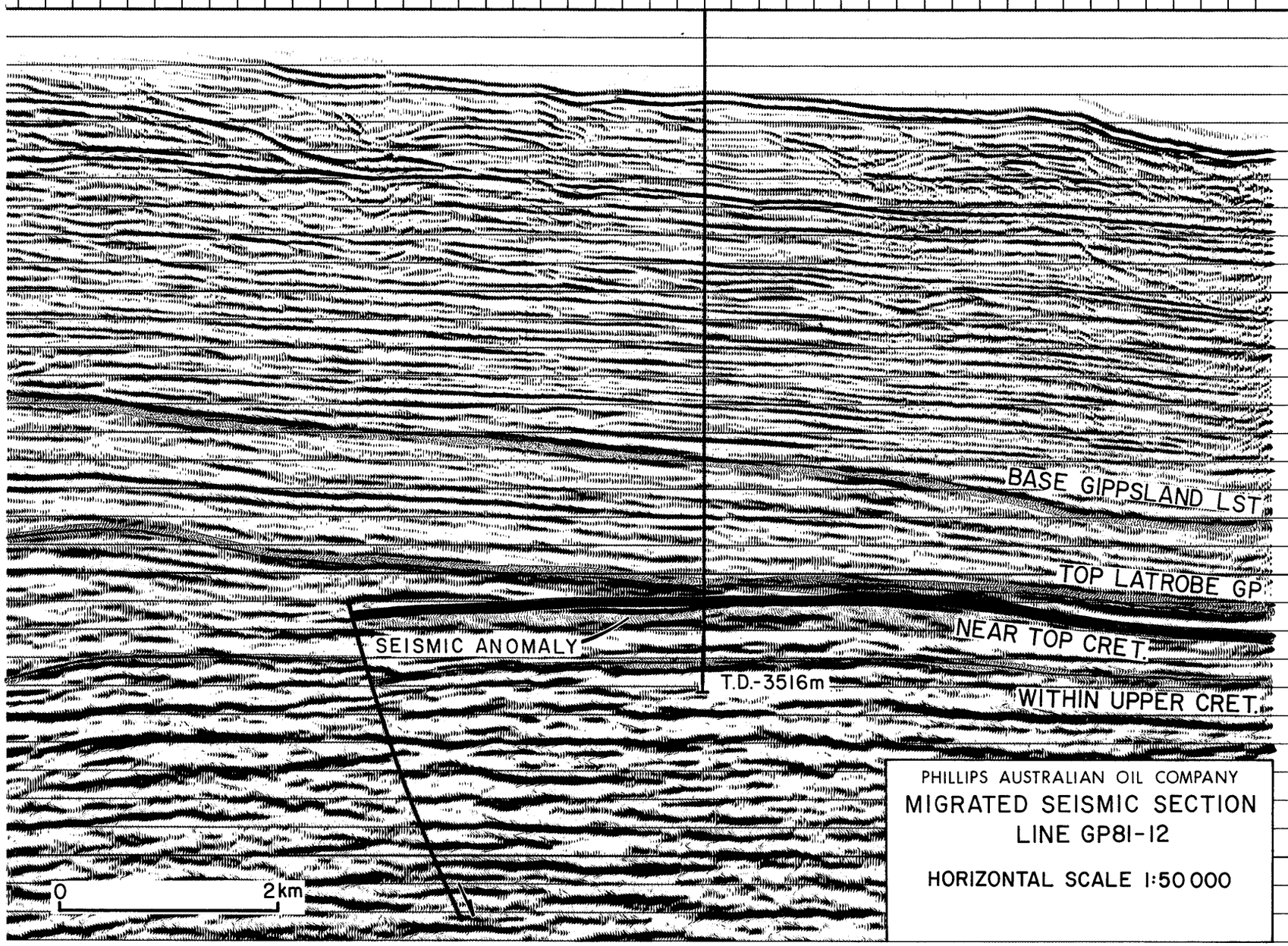
LINE GP81-12 (MIGRATED)

E

SELENE-1

132 144 198 220 248 254 289 297 370 WATER DEPTH(M)

400 450 500 550 600 650 700 750 800 SHOTPOINTS



0.0 1.0 2.0 3.0

TIME IN SECONDS

PHILLIPS AUSTRALIAN OIL COMPANY

MIGRATED SEISMIC SECTION

LINE GP81-12

HORIZONTAL SCALE 1:50 000

A-5544

FIGURE 14

PE906308

This is an enclosure indicator page.
The enclosure PE906308 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906308 has the following characteristics:

ITEM_BARCODE	= PE906308
CONTAINER_BARCODE	= PE902605
NAME	= Seismic Line GP81-91
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= SEISMIC
SUBTYPE	= SECTION
DESCRIPTION	= Interpreted Seismic Section of Line GP81-91, containing Selene-1
REMARKS	= A4 page, hand-coloured
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

LINE GP81-91 (MIGRATED)

S

N

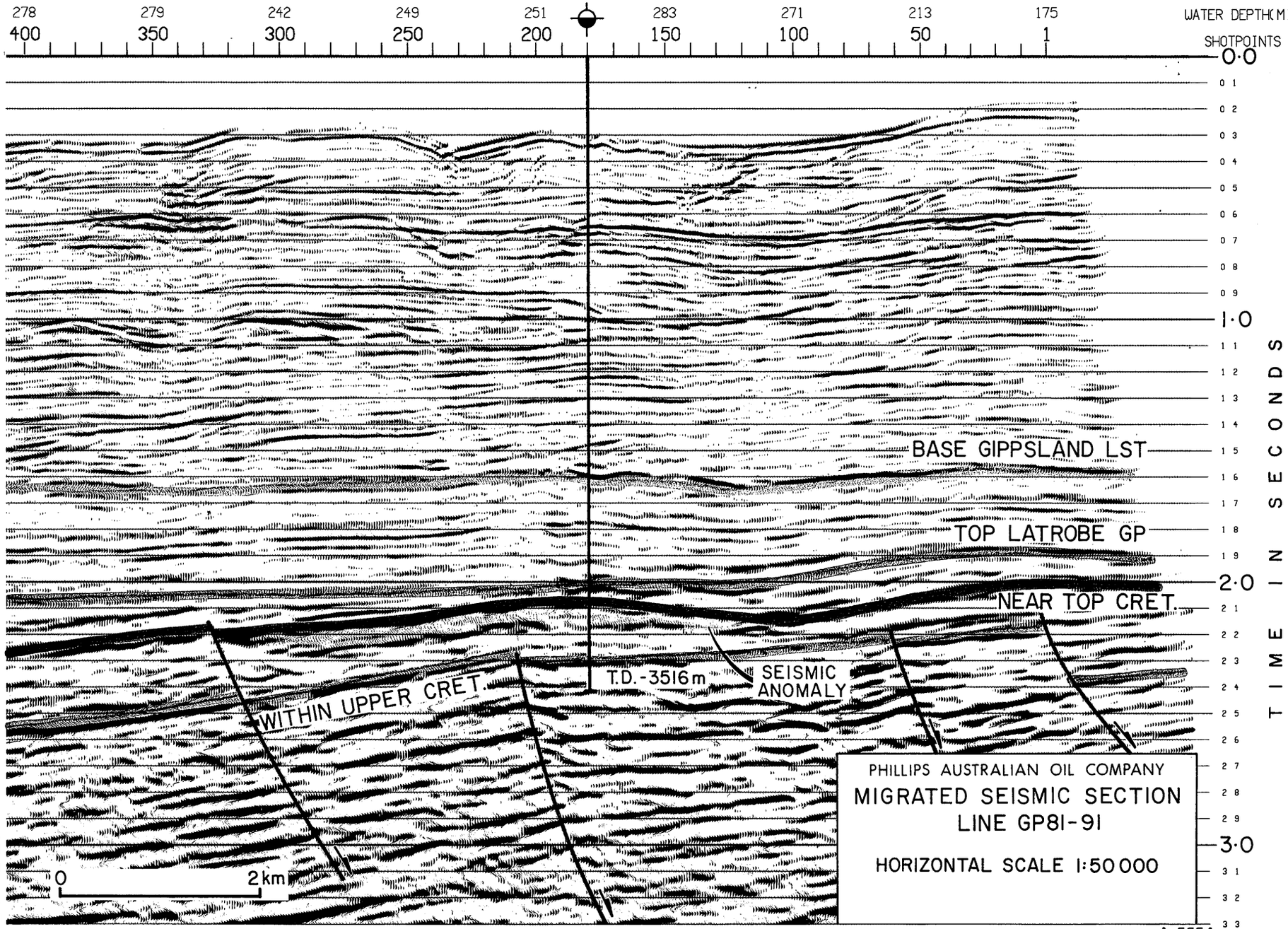
SELENE-1 (PROJ.)

278 279 242 249 251 283 271 213 175

400 350 300 250 200 150 100 50 1

WATER DEPTH(M)

SHOTPOINTS



TIME IN SECONDS

0·0 0 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 1·0 1 1 1 2 1 3 1 4 1 5 1 6 1 7 1 8 1 9 2·0 2 1 2 2 2 3 2 4 2 5 2 6 2 7 2 8 2 9 3·0 3 1 3 2 3 3

PHILLIPS AUSTRALIAN OIL COMPANY

MIGRATED SEISMIC SECTION
LINE GP81-91

HORIZONTAL SCALE 1:50 000

A-5554

FIGURE 15

The interpretation that the anomaly was of stratigraphic origin was supported by special colour aspect processing of several lines across the anomaly. These data suggested that the strong seismic event which defined the anomaly was a high impedance layer and sequence boundary - probably a sealing unit - overlying a low impedance layer interpreted as a porous sand body approximately 60 metres in thickness. Preliminary depth conversion of the Top Latrobe horizon (Figure 16) defined a closed area of 6.4 square kilometres with approximately 100 metres of vertical closure, in the area immediately overlying the deeper anomaly. This closure was regarded as being questionable because velocities used for the conversion were still under review at the time the well was spudded.

Although the Selene No. 1 well penetrated a number of thick porous sand bodies within the upper portion of the Latrobe Group these have been correlated with the clinoformal seismic sequence immediately overlying the interpreted anomaly. No closure is developed within this strongly prograding sequence. The seismic anomaly which was the primary target in the well (identified as such on Figures 14 and 15) has been correlated with a sequence of thinly-interbedded coastal-marsh sandstones, siltstones and shales lying immediately above the paludal swamp coal measures. The anomalously strong character of the seismic reflection correlated with the top of this sequence appears to be a reinforcement effect related to the thinly-interbedded nature of the coastal marsh sediments.

The results of the velocity survey conducted in the well showed that the seismic mapping horizon correlated with the top of the Latrobe Group had been picked one leg too high in the area of the Selene Prospect. In addition to this error, a review of the velocities used in the original depth conversion indicated that incorrect velocities had been used. A revised Top Latrobe map of the Selene area (Figure 17) prepared after completion of the Selene No. 1 demonstrates that no closure is developed at this level at the well location.

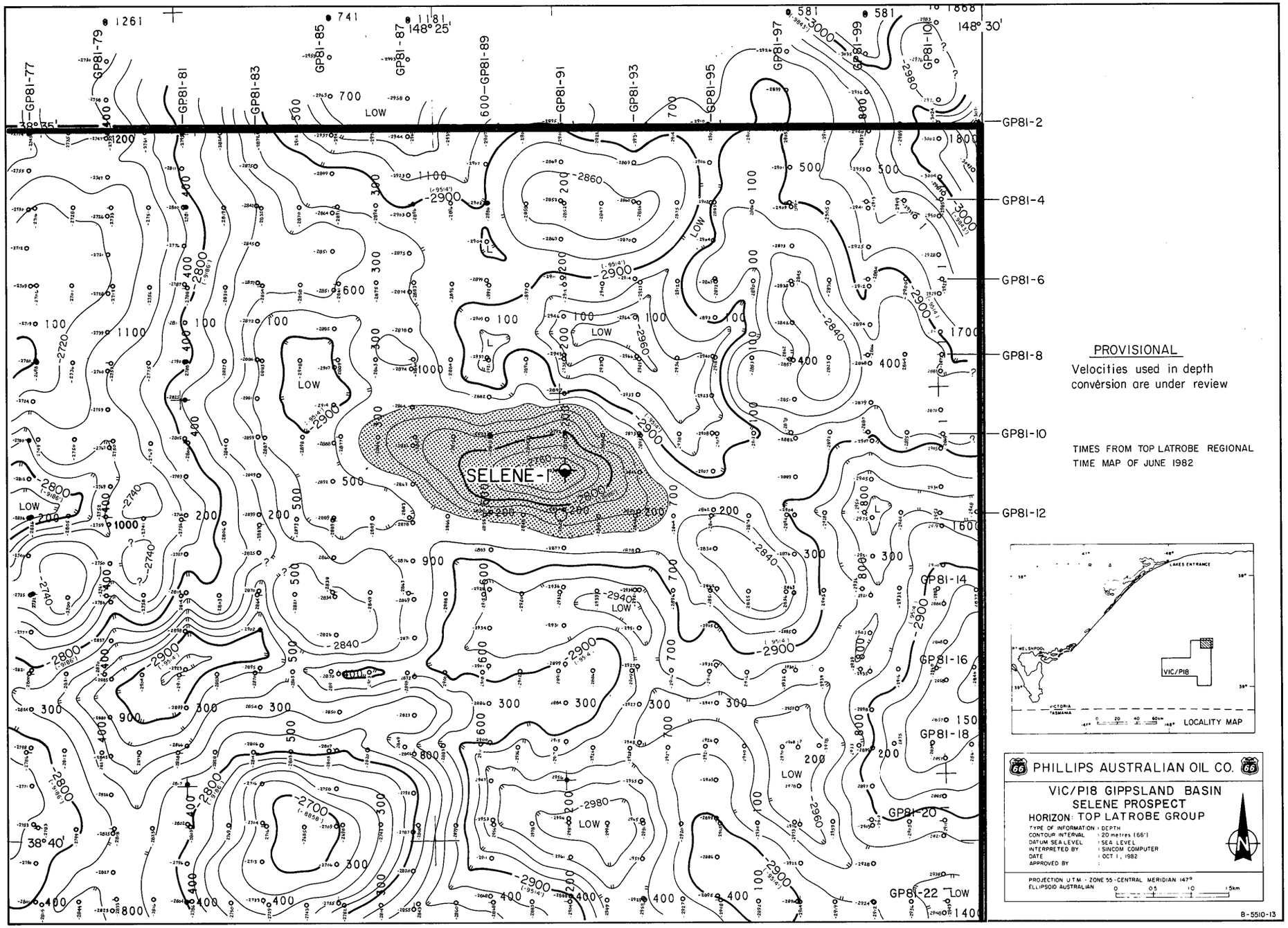

148° 25'
148° 30'
38° 35'
38° 40'
GP81-77
GP81-79
GP81-81
GP81-83
GP81-85
GP81-87
GP81-89
GP81-91
GP81-93
GP81-95
GP81-97
GP81-99
GP81-101
GP81-2
GP81-4
GP81-6
GP81-8
GP81-10
GP81-12
GP81-14
GP81-16
GP81-18
GP81-20
GP81-22
SELENE-1
LOW
PROVISIONAL
Velocities used in depth conversion are under review
TIMES FROM TOP LATROBE REGIONAL TIME MAP OF JUNE 1982
LAKES ENTRANCE
WELSHPOOL
VICTORIA
TASMANIA
VIC/P18
LOCALITY MAP
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
SELENE PROSPECT
HORIZON: TOP LATROBE GROUP
TYPE OF INFORMATION : DEPTH
CONTOUR INTERVAL : 20 metres (66')
DATUM SEA LEVEL : SEA LEVEL
INTERPRETED BY : SINCOM COMPUTER
DATE : OCT 1, 1982
APPROVED BY :
PROJECTION U.T.M. - ZONE 55 - CENTRAL MERIDIAN 147°
ELLIPSOID AUSTRALIAN
0 0.5 1.0 1.5km
B-5510-13

FIGURE 16

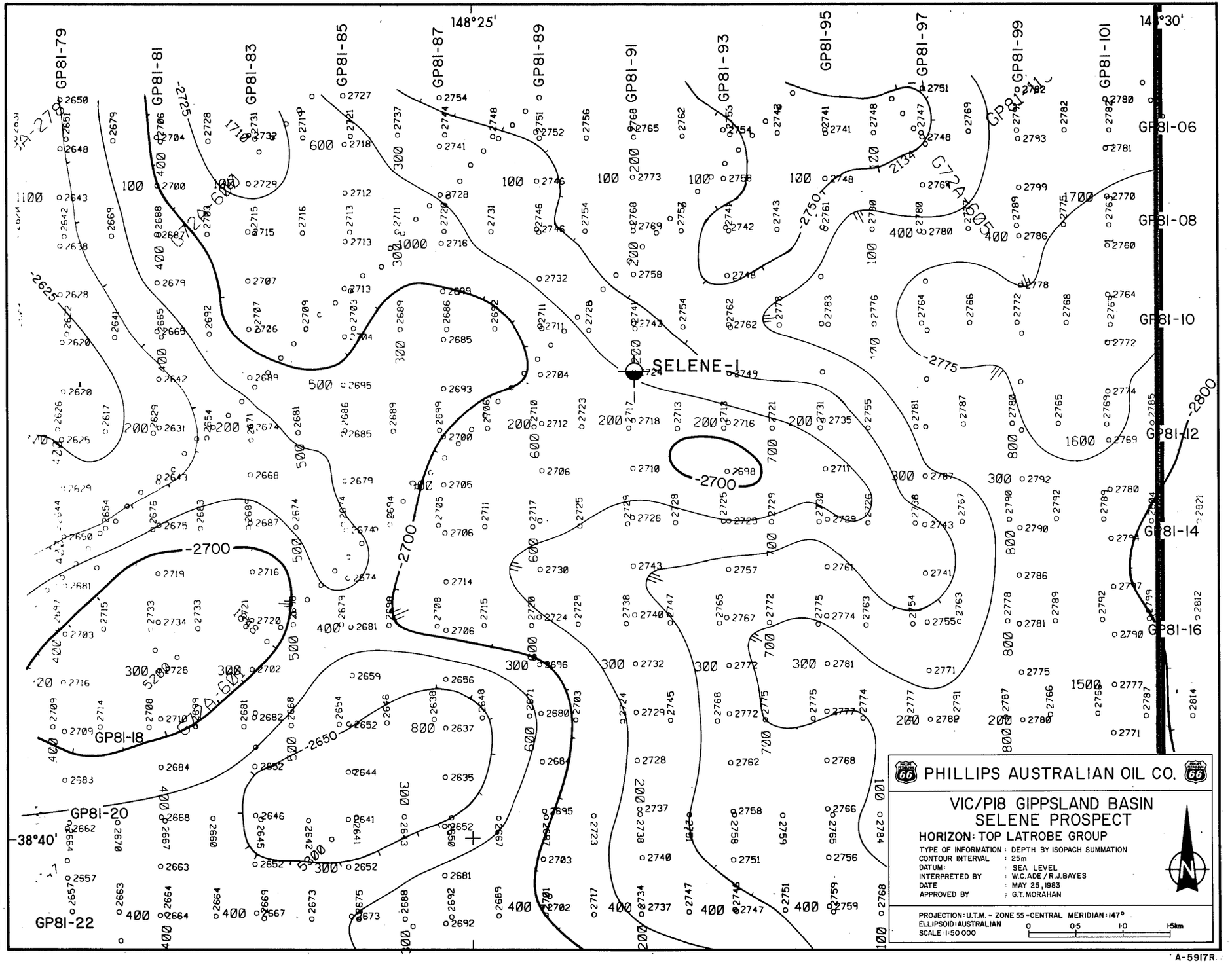

148°25'
14°30'
38°40'
GP81-79
GP81-81
GP81-83
GP81-85
GP81-87
GP81-89
GP81-91
GP81-93
GP81-95
GP81-97
GP81-99
GP81-101
GP81-06
GP81-08
GP81-10
GP81-12
GP81-14
GP81-16
GP81-18
GP81-20
GP81-22
SELENE-1
-2700
-2625
-2650
-2675
-2725
-2750
-2775
-2800
PHILLIPS AUSTRALIAN OIL CO.
VIC/P18 GIPPSLAND BASIN
SELENE PROSPECT
HORIZON: TOP LATROBE GROUP
TYPE OF INFORMATION : DEPTH BY ISOPACH SUMMATION
CONTOUR INTERVAL : 25m
DATUM : SEA LEVEL
INTERPRETED BY : W.C.ADE / R.J.BAYES
DATE : MAY 25, 1983
APPROVED BY : G.T.MORAHAN
PROJECTION: U.T.M. - ZONE 55 - CENTRAL MERIDIAN: 147°
ELLIPSOID: AUSTRALIAN
SCALE 1:50 000
0 0·5 1·0 1·5km
N
A-5917R

FIGURE 17

RELEVANCE TO THE OCCURRENCE OF HYDROCARBONS

Hydrocarbon Indicators

A continuous record of mud gas readings was maintained by Geoservices after drilling out of the 20-inch casing shoe at 581.5 metres (Addendum 2, Enclosures 2 and 3). Total gas determination and chromatographic analysis were conducted using a flame ionization detector with a gas chromatograph (GAL Chromatograph Mod 78) as backup.

Shows during drilling were generally insignificant. Primary fluorescence was rare and then only minor. Gas readings seldom rose above 1% C_1, and were normally much lower.

Shows during drilling were as follows:

600 - 900 metres	Trace C_1, no fluorescence.
900 - 1264 metres	Trace to 0.1% C_1, no fluorescence.
1264 - 1270 metres	Trace C_1, no fluorescence.
1270 - 1540 metres	Trace to 0.1% C_1, no fluorescence.
1540 - 1612 metres	Trace to 0.1% C_1, no fluorescence.
1612 - 1620 metres	Trip gas 0.3%. Background gas 0.1%, connection gas 0.4%, no fluorescence.
1620 - 1650 metres	0.4% connection gas, 0.6% max drill gas, no fluorescence.

1650 - 1780 metres	Trace C_1 and C_2, no fluorescence.
1780 - 1900 metres	0.755 C_1, no fluorescence.
1900 - 1960 metres	Trace background gas, no fluorescence.
1960 - 2030 metres	0.3% background gas, no fluorescence.
2030 - 2050 metres	Trace background gas, no fluorescence.
2050 - 2080 metres	0.2% trip gas, no fluorescence.
2080 - 2140 metres	Trace background gas, no fluorescence.
2140 - 2150 metres	1% C_1, no fluorescence.
2150 - 2190 metres	Trace background gas, no fluorescence.
2190 - 2220 metres	0.4% trip gas, 0.15% C_1, no fluorescence.
2220 - 2490 metres	Trace background gas, no fluorescence.
2490 - 2640 metres	2.0% trip gas, 0.7% C_1, no fluorescence.
2640 - 2800 metres	0.2% C_1, 0.01% C_2, no fluorescence.
2800 - 2820 metres	0.13% C_1, 0.01% C_2, no fluorescence.
2820 - 2843 metres	0.005% C_1, 0.005% C_2, no fluorescence.
2843 - 2895 metres	0.1% C_1, 0.01% C_2, no fluorescence.
2898 - 2920 metres	Trace C_1.

2920 - 2935 metres Trace 0.01% C_1, trace C_2.

2935 - 2975 metres Trace 0.25% C_1, trace C_2.

2975 - 2980 metres Trace C_1.

Circulated drilling breaks at 2936 metres and 2943 metres.

Show Evaluation : No detectable odour, no stain, faint primary fluorescence, fluorescence brightness-spotted, dry cut - thick film, instant wet cut, fair hot water test, fair iridescence, colour of cut fluorescence - straw.

2980 - 3030 metres Trace C_1.

3030 - 3112 metres Trace C_1, trace C_2.

3112 - 3133 metres Trace C_1, trace C_2, trace C_3.

3133 - 3140 metres Trace C_1, 0.013% C_2, trace C_3, trace C_4.

Circulated drilling break at 3019 metres.

No visual increase in gas, no significant primary or cut fluorescence.

Circulated drilling break at 3133 metres.

Show Evaluation : No detectable odour, very slight stain, dull primary fluorescence, fluorescence brightness - spotted, instant wet cut, weak hot water test, weak irridescence, yellow primary fluorescence, amber cut fluorescence.

3140 - 3151 metres Trace 0.15% C_1, trace 0.017% C_2, light yellow primary fluorescence, light blue cut fluorescence, minor light blue-white cut fluorescence.

3151 - 3155.6 metres No samples.

3155.6 - 3159.3 metres Trace 0.16% C_1, trace 0.035% C_2, 0.025% C_3, trace C_4, no fluorescence.

3159.3 - 3161 metres Trace C_1, trace C_2.

Core Number 1 Show Descriptions

3141 - 3141.8 metres Minor pinpoint primary fluorescence, light blue-white cut.

3143.3 - 3145 metres No primary fluorescence, minor pale yellow cut in part.

3147.1 - 3149.3 metres No primary fluorescence, pale yellow cut.

3154 - 3155.5 metres No primary fluorescence, streaming to faint yellow-white to pale white cut.

End of Core Number 1 Show Descriptions

3162.5 - 3216 metres Trace C_1, trace C_2, no primary fluorescence, pale to bright yellow streaming-instant cut.

3216 - 3225 metres Trace C_1, no primary fluorescence, streaming pale yellow to blue-white cut.

3225 - 3250 metres — Trace C_1, trace C_2, trace C_3, no primary fluorescence, pale white seeping to crush cut.

Core Number 2 Show Descriptions

3157.25 - 3159.93 metres — No primary fluorescence, instant yellow with streaming yellow cut.

End of Core Number 2 Show Descriptions

3250 - 3290 metres — Trace C_1, trace C_2, trace C_3, no shows.

3290 - 3390 metres — Trace 0.9% C_1, trace 0.07% C_2, trace 0.03% C_3, trace C_4. No shows.

3390 - 3430 metres — 0.9% - 1.3% C_1,. 0.1% - 0.3% C_2, 0.01% - 0.09% C_3, no shows.

3430 - 3530 metres — 0.24% - 1.5% C_1, 0.02% - 0.12% C_2, 0.01% - 0.05 % C_3, no shows.

3530 - 3539 metres — 0.1% - 0.12% C_1, 0.005% - 0.01% C_2, trace C_3, no shows.

The presence of hydrocarbons was indicated by conventional core analysis (Appendix 5 and Enclosure 7), computer processed log interpretations (Enclosures 5 and 6), and Repeat Formation Tester (Appendix 9). Two conventional cores were cut namely, core number 1 from 3140.0 metres to 3155.6 metres and core number 2 from 3155.6 metres to 3162.2 metres. The measured hydrocarbon saturation (% pore vol) ranged between 0.5% and 3.5% in core number 1. The computer processed log interpretation (Enclosure 5) indicates minor hydrocarbon saturations throughout the Latrobe interval.

The Repeat Formation Tester recovered formation water in the first chamber with a slight hydrocarbon film. The second chamber recovered formation water which had a petroliferous odour. All of the hydrocarbon shows described above are considered to be indicative of early-maturation hydrocarbons dispersed through the formation at very low saturations. As such, they are not indicative of reservoired hydrocarbons.

Porosity and Permeability

Potential reservoir sections in Selene No. 1 are contained within the Mid-Eocene Gurnard and Flounder Formations, the Paleocene (?)-Maastrichtian Latrobe coarse clastics and the Maastrichtian-Campanian thin point bar and braided stream sands. A log analysis is presented in Appendix 12, a Computer Log Analysis Plot is presented in Enclosures 5 and 6 and a Repeat Formation Tester Analysis is presented in Appendix 9.

Sandstones within the Gurnard Formation occur in two zones. Zone 1 extends from 2828.5 metres to 2831.5 metres (2.5 metres) with porosities ranging from 1.4% to 14.4% with a 9.5% average. Zone 2 extends from 2833 metres to 2839 metres with porosities ranging from 7.3% to 24.5% with a 15.6% average. Both zones are clayey-to-silty intertidal estuarine sands with abundant glauconite. The Flounder Formation has one zone 3.7 metres thick with porosities from 9.1% to 23.4% with a 13.9% average. The reservoir consists of barrier/dune sands.

The best reservoir sands in Selene No. 1 are found in the Top Latrobe coarse clastics. Porosities vary from 11% to 29%, averaging 22%. These sands range in thickness from 3 metres up to 23 metres and total approximately 118 metres. The average thickness is about 13 metres. A particularly good sequence of reservoirs is developed between 2848 metres and 2986 metres. The sands are, in general, offshore and barrier bars becoming barrier island/beach strand line sands lower in the section.

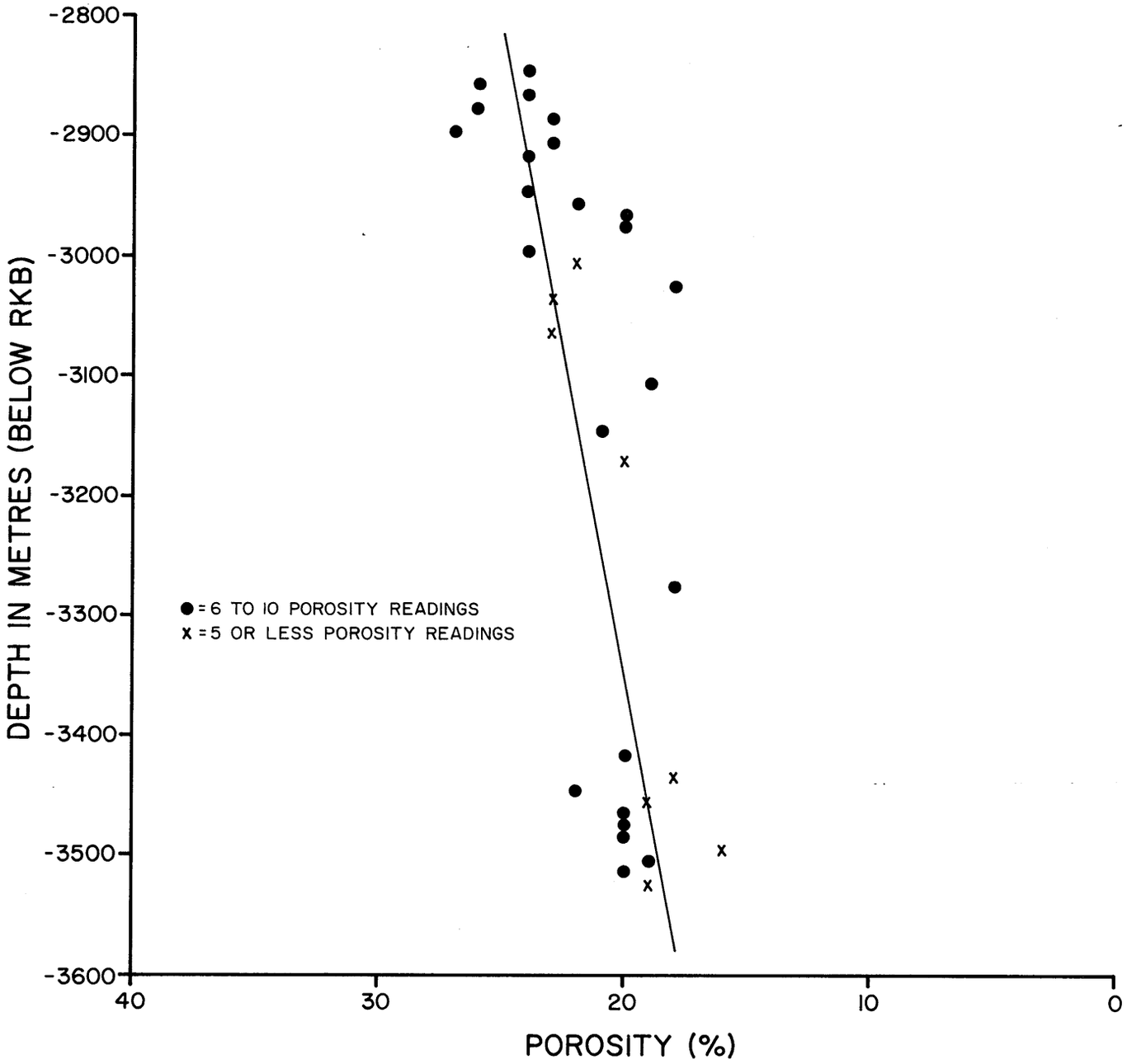
Sandstones within the paludal swamp deposits of the Latrobe Group are thin point bars which average between 3 metres and 4 metres in thickness. The porosity of these point bar sands ranges from 17% to 28% with an average of 22%. There are approximately 11 of these sands between 2986 metres and 3436 metres totalling about 38 metres in thickness.

Below 3436 metres sand becomes the dominant lithology in a fluvial-upper delta plain braided-stream alluvium sequence. Nine reservoirs are developed for a total thickness of 59 metres. The reservoirs average 6.6 metres in thickness and have porosities that range from 7% to 28% with an average of 20%.

Two conventional cores were cut from 3140.0 metres to 3155.6 metres and 3155.6 metres to 3162.0 metres. Paludal swamp point bar sands were cored which have excellent porosity and permeability. The average porosity is 23% with a maximum of 28.6%. The average permeability is about 600 millidarcies with much of the sand testing at greater than 1 darcy (Appendix 5). Repeat Formation Tester results between 3023 metres and 3502 metres indicate very high to extremely high permeabilities in the sands in which pressure readings were taken (Appendix 9).

Figure 18 shows the trend of porosity of the first clean sands of the Latrobe Group at around 2848 metres to total depth of 3539 metres. Clean uncemented sands were selected to show the effect of compaction.

SANDSTONE POROSITY Vs DEPTH
SELENE-I



POROSITY FROM GLOBAL CROSS PLOT OF WIRELINE LOGS

A-5850

FIGURE 18

SOURCE ROCK POTENTIAL

The hydrocarbon source rock potential of the sedimentary section encountered in Selene No. 1 was evaluated using geochemical analysis, palynological and vitrinite reflectance data, and borehole temperature measurements.

Canned cuttings samples were taken over 10-metre composite intervals from 2830 metres, near the top of the Latrobe Group, down to total depth. Organic geochemical analyses were carried out on 64 canned cuttings samples by Analabs for total organic carbon (TOC) content and were also analysed by gas chromatography and pyrolysis (Appendix No. 10).

Visual kerogen analysis and pyrolysis studies were also carried out on 7 core chips and 13 sidewall cores by the Exploration Projects Section of Phillips Petroleum Company (Appendix No. 11).

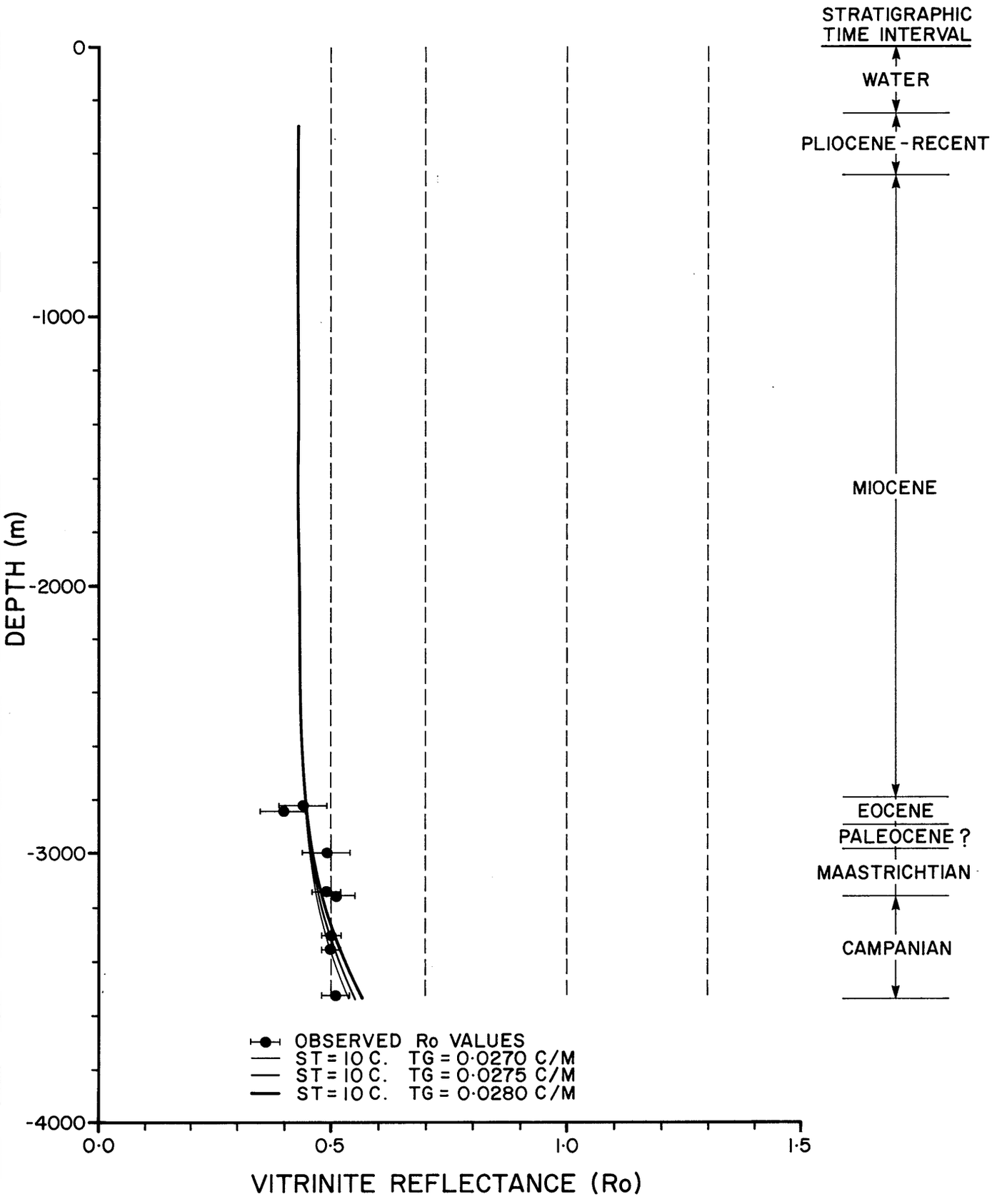
The rocks within the interval 3080 metres to 3450 metres contain moderate to very high amounts of total organic carbon (Appendix No. 10) and would have an excellent hydrocarbon generating potential at higher levels of thermal maturity. Because of the thermally immature nature of these sediments very little hydorcarbon has been generated from oil prone organic matter contained in these rocks. The hydrocarbons that have been generated has not overcome the absorptivity of the sediments and its presence is indicated by cut fluorescence and minor hydrocarbon saturations on the computer processed logs.

Vitrinite reflectance (Ro) data suggest that the onset of petroleum generation (Ro 0.5%) occurs at approximately 3300 metres according to the linear trend in Figure 19. At 3539 metres (T.D.) an Ro of 0.55% is indicative that only an early stage of thermal maturity has been reached. Consequently no significant source rock potential is indicated in any of these samples at their present level of thermal maturity. At higher levels of thermal maturity, however, the samples could have generated and expelled large amounts of hydrocarbons into available reservoirs. The onset of the peak zone of liquid hydrocarbon generation (Ro 0.65 to 1.0%) is reached at approximately 3800 metres by extrapolation below total depth.

The present day geothermal gradient at Selene No. 1 is 2.86°C/100 metres (1.57°F/100 feet) as calculated from the bottom hole temperature at total depth extrapolated to static equilibrium and assuming a seafloor temperature of 15.5°C.

VITRINITE REFLECTANCE Vs DEPTH

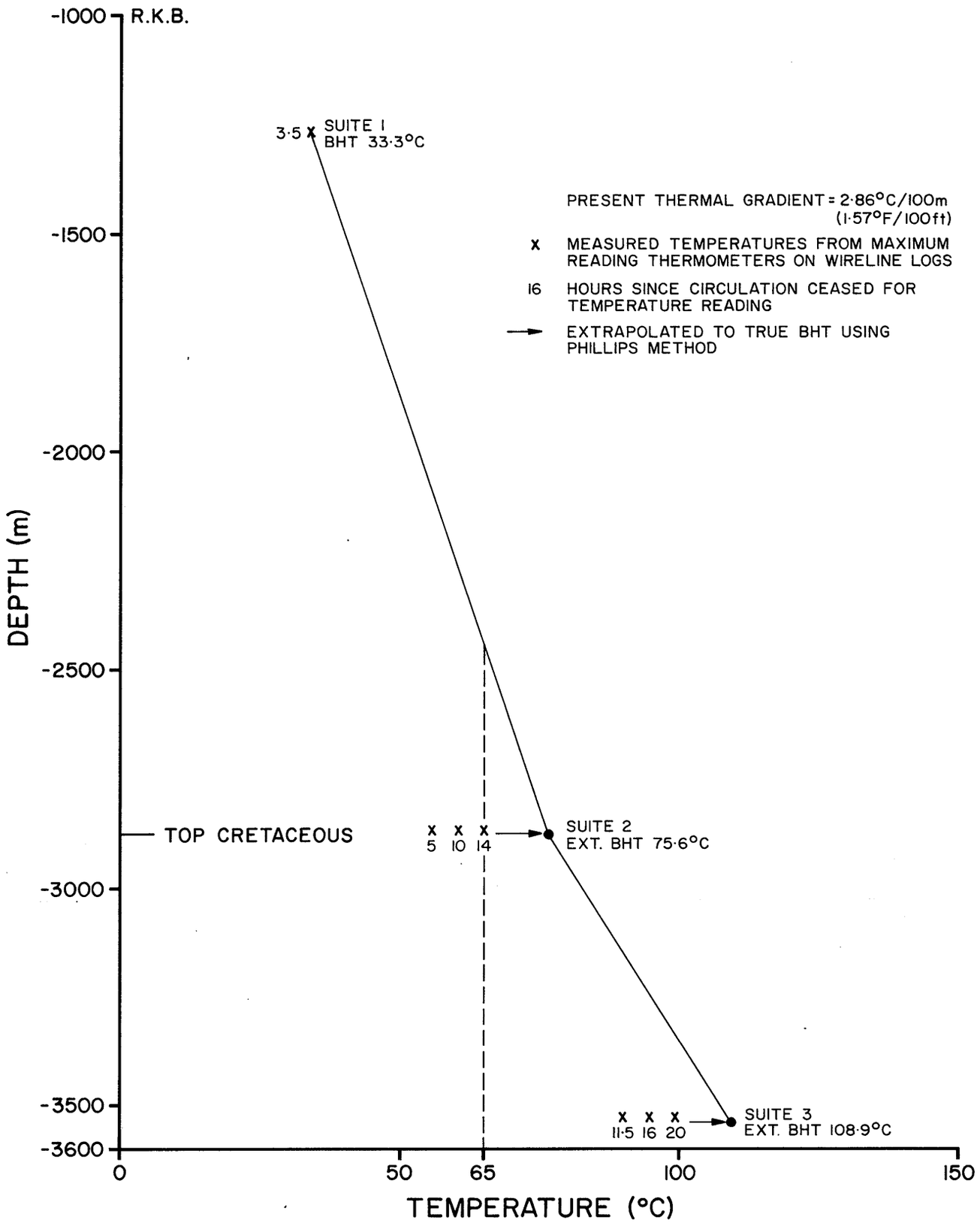
SELENE-1



A-5849

FIGURE 19

TEMPERATURE Vs DEPTH
SELENE-I



A-5848

FIGURE 20

SUMMARY OF HYDROCARBON SIGNIFICANCE

1. The lack of significant accumulations of hydrocarbons in Selene No. 1 can be attributed to the following parameters:

   (i) A suitable intra-Latrobe sand reservoir, although not as thick as the original primary target, was penetrated at 2938 metres and extended downward 47 metres. This sand body correlates one leg higher than that of the predicted primary seismic target which proved to be a sequence of paludal swamp sandstones, siltstones and shales. The higher sand body lacked a top seal and also structural closure because of its clinoformal nature.

   (ii) The paludal swamp sequence penetrated beneath the beach-barrier clinoformal sands contained a number of thin reservoir sands, each of which was encased by shale and siltstone, and therefore presumably sealed. The most probable reason for the lack of hydrocarbons in these sands is the immaturity of the adjacent source rock sections. Although the total organic carbon content of the paludal swamp shales is very high they lack suitable burial depth to be thermally mature. Slight shows of hydrocarbons encountered in these sands possibly represent the early stages of hydrocarbon generation from these organic-rich rocks.

   (iii) Good quality reservoir rocks were present near the top of the Latrobe Group with seal provided by the Flounder-Gurnard Formations. The absence of hydrocarbons at this level is explained by the lack of structural closure.

2. Sandstone reservoirs with good porosities were evident throughout most of the Latrobe Group penetrated in Selene No. 1. Exceptionally good reservoirs were found in the Latrobe Coarse Clastics from 2848 metres to 2986 metres and in the upper delta plain (braided stream) deposits near the base of the well from 3436 metres to 3539 metres. Permeabilities, where tested, were found to be excellent and are also estimated to be good to excellent throughout most of the sands.

3. The rocks penetrated in Selene No. 1 have experienced a very low geothermal history, and consequently they are interpreted to be within the pre-oil generating zone. At a more mature position within the basin, the stratigraphic equivalents of the sediments penetrated between 3080 metres and 3450 metres would be expected to have generated and expelled large amounts of hydrocarbons into available reservoirs.

CONTRIBUTIONS TO GEOLOGICAL KNOWLEDGE

1. The absence of Oligocene sediments in Selene No. 1 indicates significant erosion or non-deposition associated with the "Cobia Event", which represents the final opening of a deep sea way between Australia and Antarctica.

2. The Colquhoun Formation conformably underlies the Lakes Entrance Formation and represents intertidal deposition occurring just before the Late Eocene-to-Early Oligocene marine transgression.

3. The Gurnard Formation, of late Mid-Eocene age, is separated from the overlying late Mid-Eocene Colquhoun Formation and the underlying early Mid-Eocene Flounder Formation by unconformities. These unconformities reflect the unstable nature of the region during Mid-to-Late Eocene time created by the continuing separation of Australia from Antarctica.

4. The coarse clastics of the Flounder Formation are much siltier than the relatively clean sands of the Top Latrobe Coarse Clastics. The environment of deposition as indicated by electric logs and paleontological data, suggests a barrier/dune/lagoonal system for the Flounder Formation while the Top Latrobe Coarse Clastics were deposited in a higher energy environment, probably as offshore and barrier bars which were reworked and progressively washed clean of silt and clay.

5. Below 2986 metres sedimentation was fluvially dominated with occasional minor marine influences occurring in lagoonal sediments over the interval 2986 metres to 3029.5 metres.

6. A massive sand was penetrated from 2938 metres to 2986 metres which probably represents a barrier island/beach strand line system.

7. A paludal swamp coal measures sequence of Late Cretaceous age was penetrated between 3029.5 metres and 3436 metres.

8. Below 3436 metres a sand-dominated sequence of upper delta plain braided stream alluvium was penetrated. These sands have excellent reservoir potential and should be considered a major exploration objective in the northeastern portion of Vic/P18.

9. Dipmeter analysis suggests a generally northeasterly sediment source for most of the Upper Cretaceous, changing to a northwesterly source for the Late Cretaceous to Paleocene section. Eocene sedimentation of the condensed sequence at the Top Latrobe Group was generally from the north.

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Helios No. 1 Well Completion Report.

TAYLOR, D., 1983:

The Gippsland Basin Enigma - Top Latrobe for:- Phillips Australian Oil Company.

APPENDICES

APPENDIX NO. 3

DETAILED LITHOLOGICAL DESCRIPTIONS

APPENDIX NO. 3

DETAILED LITHOLOGICAL DESCRIPTION

All depths quoted are below Rotary Kelly Bushing, which is 23 metres above Mean Sea Level and 253 metres above the sea bed. Drill cuttings were collected at 10-metre intervals commencing at 600 metres after drilling out of the 20-inch casing shoe at 581.5 metres. No samples were collected while drilling top hole down to the 20-inch casing depth, with all returns to the sea floor.

600m - 615m (15m)	Calcarenite: White to light grey, soft to moderately hard, coarsely crystalline, calcareous cement, speckled with occasional fragments of carbonaceous material, abundant microfossils-forams, occasional sand grains.
615m - 620m (5m)	Marl: Grey, very calcareous, very clayey, very sticky/plasticky.
620m - 809m (189m)	Calcarenite: White to light grey, coarsely crystalline, calcareous cement, well sorted, fossil fragments, occasional glauconite, occasional carbonaceous material with interbedded Marl, grey, very calcareous, very clayey, very sticky/plasticky, occasional glauconite, occasional carbonaceous material.

809m - 858m (49m) — Calcarenite: White to light grey, coarsely crystalline, calcareous cement, well sorted, fossil fragments, occasional glauconite, occasional carbonaceous material, with increase in interbedded Marl, grey, very calcareous, becoming less clayey, less sticky-plasticky, occasional glauconite, occasional carbonaceous material.

858m - 1019m (161m) — Calcarenite: Grey to dark grey, soft to moderately hard, microfossils and fossil fragments, speckled with carbonaceous material, occasional fine-grained clear quartz, subangular to subrounded, trace glauconitic material, interbedded with Marl, light grey, very calcareous, clayey and sticky.

1019m - 1067m (48m) — Calcarenite: Grey to dark grey, soft to moderately hard, microfossils and fossil fragments, speckled with carbonaceous material, occasional fine-grained clear quartz, subangular to subrounded, trace glauconitic material, with increase in interbedded Marl, light grey, very calcareous, clayey and sticky.

1067m - 1100m (33m) — Marl: Light grey, very calcareous, clayey/sticky, with carbonaceous material, glauconite.

1100m - 1268m (168m) — Calcarenite: White to medium grey, soft to moderately firm, occasional fossil fragments, occasional carbonaceous specks, occasional fine-grained clear quartz, subangular to subrounded, trace glauconite material, with interbedded Marl, light grey, very calcareous, clayey and sticky.

1268m - 1475m (207m) Calcilutite: Medium grey, homogeneous, firm to hard, moderately abundant-to-abundant glauconite pellets, occasional fossil fragments and microfossils, occasional carbonaceous specks, with minor interbedded Marl, light grey to grey, soft, sticky.

1475m - 1647m (172m) Calcilutite: Light-to-dark grey, homogeneous, firm, blocky, rare quartz sand grains, clear, subround to round, occasional fossil fragments, abundant glauconite pellets, with interbedded Marl, grey, soft, sticky.

1647m - 2234m (587m) Calcarenite: Light-to-dark grey, homogeneous, firm to moderately hard, moderate-to-abundant micritic cement, moderate-to-abundant glauconite, moderate-to-abundant carbonaceous specks, occasionally marly-to-clayey matrix, occasional fossil fragments, with occasional interbedded Claystone, light-to-dark grey, homogeneous, moderately firm to firm, abundant glauconite, slightly silty, with very minor interbedded Shale, light-to-dark grey, moderately hard, calcareous.

2234m - 2486m (252m) Claystone: Medium grey, homogeneous, moderately firm to firm, slightly silty to moderately silty, very calcareous, rare fossil fragments, occasional carbonaceous material, rare glauconite, with interbedded, Marl, light-to-dark grey, soft and sticky to firm, occasional carbonaceous material, very calcareous, with very minor Shale, dark grey, firm to moderately hard, platy to subfissile.

2486m - 2798m (312m) Shale: Medium-to-dark grey to medium olive, firm to moderately hard, subfissile to fissile, calcareous, occasional carbonaceous plant fragments, silty, blocky in part, with interbedded Claystone, light-to-medium grey to greenish grey, soft to moderately hard, very calcareous, blocky, occasional carbonaceous specks, trace to occasional glauconite, rare pyrite.

2798m - 2822.5m (24.5) Claystone: Medium grey, massive, homogeneous, firm, sticky in part, very calcareous, abundant glauconite in blebs and pellets, trace pyrite, rare plant fragments, moderately silty in part.

2822.5m - 2825m (2.5m) Mudstone: Dark grey to black, subfissile to blocky, silty, extremely calcareous, slightly carbonaceous, soft in part.

2825m - 2839m (14m) Sandstone: Dark grey to greenish grey, medium-to-very coarse grained, angular to subround, low to moderate sphericity, poorly sorted, very clayey matrix imparting sticky nature to the rock, abundant glauconite mainly as black blebs, trace-to-moderate mica, poor-to-fair visual porosity.

2839m - 2843m (4m) Sandstone: Light green to grey, medium-to-very coarse grained, angular to subround, poorly sorted, low-to-moderate sphericity, loosely cemented, calcareous, kaolinite? in matrix, abundant glauconite, trace to moderate pyrite, moderate mica, clayey matrix in part, fair visual porosity.

2843m - 2845m (2m) Interbedded Claystone and Siltstone:

Claystone: Dark grey, massive, silty to sandy, calcareous, moderate to abundant glauconite, moderate mica.

Siltstone: Dark grey to black, massive, sandy with clayey matrix, highly pyritic, slightly carbonaceus, abundant glauconite.

2845m - 2848m (3m) Sandstone: Medium-to-dark grey, coarse-to-very coarse grained with quartz pebbles, subangular to subround, moderate sphericity, poorly cemented, very clayey/silty, highly calcareous, abundant glauconite, abundant pyrite, trace mica, fair visual porosity.

2848m - 2860m (12m) Sandstone: Light-to-medium grey, fine-to-very coarse grained, angular to round, poorly sorted, poorly cemented to friable, clay matrix, slightly calcareous, abundant mica, trace-to-moderate glauconite, trace pyrite, non-calcareous cement, good visual porosity.

2860m - 2875m (15m) Sandstone: Clear to white, translucent to opaque, bimodal 1.) medium grained, occasionally coarse grained, subangular to subround, fair sorting, moderate sphericity, 2.) very coarse to granular with granules greater than 2mm, subround to round, fair-to-well sorted, poor-to-moderate sphericity, slightly calcareous cement, occasional-to-abundant mica, occasional chlorite?, trace pyrite, moderate-to-abundant glauconite pellets, good visual porosity.

2875m - 2878m (3m) Sandstone: Dark grey, fine grained to very coarse to pebbly, subangular to subround, poorly sorted, slightly calcareous, very carbonaceous, silty-to-argillaceous matrix, debris flow?

2878m - 2882m (4m) — Siltstone: Dark brown, massive, firm to moderately hard, silty to sandy, slightly calcareous, carbonaceous, very micaceous.

2882m - 2929m (47m) — Interbedded Sandstone, Siltstone and Claystone:
Sandstone: Light grey to dark grey, very fine-to-very coarse grained, occasionally conglomerate with 5mm quartz pebbles, angular to subround, poorly sorted, calcareous, poorly cemented, friable, carbonaceous, silty, micaceous, glauconitic, pyritic.
Siltstone: Dark grey, massive, moderately firm to hard, micaceous, carbonaceous.
Claystone: Medium-to-dark grey, very silty, massive, soft to moderately hard, very calcareous, trace mica.

2929m - 2938m (9m) — Siltstone: Dark grey, massive, hard, slightly calcareous, very sandy, very micaceous, very carbonaceous.

2938m - 2986m (48m) — Sandstone: Light grey to white, transparent to translucent, fine-to-very coarse grained to pebbly, angular to round, some grains angular on one side - round on other (reworked), low-to-moderate sphericity, poorly sorted, very friable to unconsolidated, calcareous, iron oxide stained in part, excellent porosity.

2986m - 3004m (18m) — Siltstone: Dark brown, hard, massive, slightly calcareous, very carbonaceous, with interbedded Sandstone, light grey, very fine-to-fine grained, mica and pyrite in part, carbonaceous.

3004m - 3080m (76m)

Interbedded Sandstone and Siltstone:

Sandstone: Clear to white to dark grey, very fine-to-very coarse grained, poorly sorted, subangular to subround, slightly calcareous to calcareous, silty-to-clayey matrix, carbonaceous, weakly cemented in part.

Siltstone: Dark brown, massive, firm to hard, very sandy with quartz pebble clastics in part, very carbonaceous, locally abundant pyrite with Sandstone, interlaminations, light grey, very fine grained, pyritic in part, occasional glauconite.

3080m - 3436m (356m)

Interbedded Sandstone, Siltstone, Claystone, Shale and Coal:

Sandstone: In thin beds, generally less than 4 metres in thickness, light to dark grey, clear to translucent, generally very fine grained, occasionally coarse to pebbly, subangular to subround, generally calcareous, occasionally non-calcareous, sorting varies from generally poorly sorted to occasionally well sorted, moderately low-to-high sphericity, poorly cemented, very silty matrix in part, carbonaceous in part, carbonaceous microlaminations in part, micaceous in part.

Siltstone: Medium-to-dark grey to dark brown, firm to hard, occasionally soft, slightly calcareous in part, very carbonaceous with microlaminations of carbonaceous-coaly material, pyritic in part.

Claystone: Dark brown, massive, firm to moderately hard, subfissile in part, silty to sandy in part, with interlaminated fine-grained Sandstone, slightly calcareous in part, very carbonaceous with Coal microlaminations, very pyritic in part, with pyrite disseminated along coal microlaminations.

Shale: Brown to dark brown to black, firm to hard, platy, occasionally silty, pyritic, abundant plant debris and virtreous coal partings, lignitic to coaly.

Coal: Black, hard, vitreous, conchoidal fracture, blocky, pyritic.

3436m - 3450m (14m) Sandstone: Light grey, coarse-to-very coarse grained, subrounded, moderate sphericity, unconsolidated with interbedded Sandstone, light grey, fine-to-medium grained, subrounded, well sorted, moderate sphericity, silty matrix, carbonaceous.

3450m - 3458m (8m) Sandstone: Light grey, fine grained to coarse grained to pebbly, subangular to subround, poorly sorted, non-calcareous, silty matrix, poorly cemented, friable, micaceous, fair visual porosity, with interbedded Shale, dark brown, soft, non-calcareous.

3458m - 3473m (15m) Sandstone: Light grey, fine-to-coarse grained to pebbly, subangular to subround, poorly sorted, non-calcareous, silty matrix, poorly cemented, friable, poor visual porosity.

3473m - 3477m (4m) Claystone: Black, silty to very sandy, slightly calcareous, soft, micaceous with interbedded Sandstone, light grey, fine-to-coarse grained, calcareous, silty matrix, poor visual porosity.

3477m - 3485m (8m) Sandstone: Light grey, coarse-to-very coarse grained, subrounded, moderate sphericity, unconsolidated, with interbedded Sandstone, light grey, fine grained, subrounded, well sorted, moderate sphericity, silty matrix.

3485m - 3495m (10m) Sandstone: Light grey, very fine-to-medium grained, subangular to subround, poorly sorted, poorly cemented with Coal, black, shiney, hard.

3495m - 3503.5m (8.5m) Sandstone: Fining upward sequence, light-to-medium grey, medium-to-coarse-to-very coarse grained at base becoming medium-to-very fine grained at top, subangular to subround, generally poorly sorted, occasionally well sorted, poorly cemented, non- calcareous to slightly calcareous, fair-to-excellent visual porosity, with Shale partings, black, very carbonaceous.

3503.5m - 3539m (35.5m) Sandstone: Dark grey to black, very fine-to-fine grained, subrounded, dolomite cement, slightly calcareous, very carbonaceous, poor visual porosity, with interbedded Siltstone, black, very carbonaceous, minor Coal, black, shiney, hard.

APPENDIX NO. 4

SIDEWALL CORE DESCRIPTIONS

SIDEWALL CORE SUMMARY

Suite No.	Run No.	Attempted	Received	Depths
2	4	51	51	2875-1270 m
3	5	51	48	3526-2875 m

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539M DATE 7/2/83 PAGE 1

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
		Runs 1 and 2 Combined Because Run 1 was Shot 5m Low (off Depth) and only 16 of Use.				
3526	2cm	Sandstone: Dark Grey, Very Fine Grained, Subrounded, Slightly Calcareous, Cement, Argillaceous Matrix, Very Carbonaceous, Mica, Poor Visual Porosity.	-	-	None	Trace Light Blue Streaming
3523	2½cm	Sandstone: Dark Grey-Black, Very Fine Grained-Fine Grained Subrounded, Slightly Calcareous, With Interlaminations of Siltstone: Black, Very Carbonaceous, Fair Visual Porosity.	-	-	None	-
3503.5	3cm	Sandstone: Light-Medium Grey, Medium-Coarse-Very Coarse Grained Subangular-Subrounded, Poorly Sorted, Silty Matrix, Poorly Cemented, Friable, Slightly Calcareous, Excellent Visual Porosity.	-	-	-	-
3501	2cm	Sandstone: Light Grey, Fine Grained, Subangular-Subrounded, Moderate Sphericity, Well Sorted, Non-Calcareous, Silty Matrix, Fair Visual Porosity.	-	-	None	-
3498.5	3cm	Sandstone: Light Grey, Very Fine-Medium Grained, Subangular to Subrounded, Poorly Sorted, Poorly Cemented, Non-Calcareous, Silty Matrix, Friable; With Shale Partings, 1-5mm, Black, Very Carbonaceous.	-	-	None	Trace Light Blue Background
3476	3cm	Claystone: Black, Silty-Very Sandy, Slightly Calcareous, Soft, Mica, With Sandstone Partings, Light Grey, Fine-Coarse Grained, Calcareous, Silty Matrix, Poor Visual Porosity.	-	-	None	-
3461	2.5cm	Sandstone: Light Grey, Fine to Coarse Grained to Pebbly, Subangular to Subrounded, Poorly Sorted, Non Calcareous, Silty Matrix, Poorly Cemented, Friable, Poor Visual Porosity.	-	-	None	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539m DATE 7/2/83 PAGE 2

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3451	2cm	Sandstone: Light Grey, Fine Grained-Coarse Grained-Pebbly, Subangular-Subrounded, Poorly Sorted, Non-calcareous, Silty Matrix, Poorly Cemented, Friable, Mica, Fair Visual Porosity.	-	-	None	-
3443	2cm	Sandstone: Very Poor Sample, Poor Recovery.	-	-	None	-
3433	3.5cm	Claystone: Dark Brown, Thinly Bedded, Very Silty, Non-Calcareous, With Interbedded Sandstone, Light Grey, Fine-Medium Grained, Well Sorted, Loosely Consolidated, Mica, Pyrite.	-	-	-	Faint Streaming Yellow-Green
3427	2cm	Claystone: Dark Brown, Firm, Non-Calcareous, Silty With Sandstone Laminations 1-3mm, Light Grey, Fine Grained, Non-Calcareous, Mica, Pyritic.	-	-	-	-
3415	3cm	Sandstone: Light Grey, Medium to Coarse Grained, Subrounded, Poorly Sorted, Slightly Calcareous, Silty Matrix, Poorly Cemented, Friable, Good Visual Porosity.	-	-	-	-
3411	4cm	Siltstone: Dark Brown, Massive, Firm, Argillaceous, Non Calcareous, Micaceous, With Sandstone Laminations, Light Grey, Fine Grained, Unconsolidated.	-	-	-	-
3401	3cm	Sandstone: Light-Dark Grey, Fine Grained, Well Sorted, Non-Calcareous, Silty Matrix, Poorly Cemented, Friable, Very Micaceous, With Carbonaceous Partings.	-	-	-	-
3390	2cm	Siltstone: Dark Brown, Massive, Slightly Calcareous, Argillaceous, Sandy, Very Carbonaceous With Thinly Interbedded Coaly Material.	-	-	-	-
3378	3cm	Sandstone: Medium Grey, Very Fine to Fine-Grained, Subangular to Subrounded, Poorly Sorted, Silty Matrix, Non Calcareous, Poorly Cemented, Friable, Mica, Fair Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539m DATE 7/2/83 PAGE 3

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3357	5cm	Shale: Dark Brown-Black, Lignitic to Coaly, Abundant Plant Debris and Vitreous Coal Partings.	-	-	-	-
3354	2cm	Sandstone: Light Grey, Very Fine to Fine Grained, Subangular to Subrounded, Moderate Sphericity, Poorly Sorted, Non-Calcareous, Silty Matrix, Poorly Cemented, Friable, Mica, Pyrite.	-	-	-	-
3333.5	4cm	Claystone: Dark Brown, Hard, Massive, Non-Calcareous, Silty-Sandy, Mica, Very Carbonaceous With Minor Coal Debris.	-	-	-	-
3310	3cm	Claystone: Dark Brown, Massive, Firm, Slightly Calcareous, Silty With Abundant Carbonaceous Material Including Coal Microlaminations.	-	-	-	-
3305	3cm	Claystone: Dark Brown, Very Silty to Sandy, Subfissile-Massive, Non-Calcareous, Firm, Very Carbonaceous With Laminations of Coal and Associated Bedded Pyrite.	-	-	-	-
3303	3cm	Sandstone: Medium Grey, Fine Grained, Well Sorted, Subrounded, Moderately High Sphericity, Non Calcareous, Poorly Cemented, Friable, Very Micaceous, Excellent Visual Porosity.	-	-	-	-
3292.5	2cm	Claystone: Dark Brown, Massive, Firm, Non-Calcareous, Very Silty, Mica.	-	-	-	-
3281	2cm	Sandstone: Light-Dark Grey, Very Fine Grained, Subrounded, Moderately Well Sorted, Non Calcareous, Silty Matrix, Fair-Poor Visual Porosity, With Carbonaceous Microlaminations (Coaly).	-	-	-	-
3266	2cm	Siltstone: Dark Brown, Soft, Massive, Argillaceous Matrix, Calcareous, Very Carbonaceous.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539m DATE 7/2/83 PAGE 4

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3214	2cm	Sandstone: Medium-Dark Grey, Very Fine Grained-Fine Grained, Subangular-Subrounded, Moderate Sphericity, Silty-Argillaceous Matrix, Non Calcareous, Very Micaceous, With Abundant Carbonaceous Material as Interlaminations and Disseminated Debris.	-	-	-	-
3195.5	2.5cm	Siltstone: Medium Grey, Massive, Firm to Hard, Non Calcareous, Mica With Microlaminations of Carbonaceous-Coaly Material and Trace Disseminated Carbonaceous Debris.	-	-	-	-
3181	2cm	Siltstone: Dark Brown, Massive, Moderate to Hard, Non Calcareous, Argillaceous Matrix, Mica, Carbonaceous.	-	-	-	-
3164	2.5cm	Claystone: Dark Brown, Massive, Firm to Moderately Hard, Slightly Calcareous, Very Silty, Very Carbonaceous With Pyrite Dissemination Along Bedding.	-	-	-	-
3154	3cm	Claystone: Dark Brown, Massive, Firm, Silty-Sandy, Mica, Slightly Calcareous, With Interlaminations of Sandstone, Light Grey, Fine Grained, Unconsolidated, Very Pyritic, Exhibiting Cross-Laminations (Cross-Bedding).	-	-	-	-
3134.5	4cm	Sandstone: Medium Grey, Fine-Medium Grained, Subangular to Subrounded, Fair Sorting, Slightly Calcareous Cemented, Silty Matrix, Fair Visual Porosity.	-	-	-	-
3121	3cm	Siltstone: Dark Brown, Massive, Firm, Non Calcareous, Very Sandy, Very Carbonaceous, With Interlaminated Sandstone, Light Grey, Fine Grained, Unconsolidated; Very Pyritic.	-	-	-	-
3105	3cm	Sandstone: Light Grey, Very Fine to Coarse Grained, Subangular to Subrounded, Moderately Low-High Sphericity, Poorly Sorted, Non Calcareous, Poorly Cemented, Friable, Mica, Excellent Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539m DATE 7/2/83 PAGE 5

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
3080	2cm	Sandstone: Light-Dark Grey, Very Fine-Very Coarse Grained, Poorly Sorted, Silty Matrix, Calcareous, With Intermixed Carbonaceous Matter, Mica.	-	-	-	-
3056	3.5cm	Sandstone: Grey, Very Fine Grained, Very Silty Matrix, Slightly Calcareous, Slightly Carbonaceous, Abundant Mica, Fair Visual Porosity.	-	-	-	-
3032	.5cm	Sandstone: Very Poor Sample, Medium Grey, Medium-Coarse Grained, Subrounded to Subangular, Poorly Sorted, Calcareous, Argillaceous Matrix?, Weakly Cemented, Friable, Neu-Dens Logs Appears Tight; Good Visual Porosity.	-	-	-	-
3027	4cm	Siltstone: Medium-Dark Grey, Hard, Massive, Sandy, Very Micaceous, Very Carbonaceous, Trace Pyrite, Slightly Calcareous.	-	-	-	-
3020	3cm	Siltstone: Dark Brown, Massive, Firm to Hard, Very Silty, Very Sandy With Quartz Pebble Clasts, Slightly Calcareous, Very Carbonaceous, Locally Abundant Dessiminated Pyrite.	-	-	-	-
2998	4cm	Siltstone: Dark Brown, Hard, Massive, Slightly Calcareous, Very Carbonaceous, With Sandstone Interlaminations, Light Grey, Very Fine Grained, Unconsolidated Mica, Pyrite in Part.	-	-	-	-
2980	1cm	Sandstone: Light Grey, Fine to Very Coarse-Pebbly, Angular to Subrounded, Moderately Low Sphericity, Poorly Sorted, Calcareous, Unconsolidated, Good to Excellent Visual Porosity, Some Iron-Oxide Stain.	-	-	-	-
2950	1cm	Sandstone: Light Grey, Very Coarse to Pebbly, Angular-Subrounded, Moderately Low Sphericity, Poorly Sorted, Calcareous, Unconsolidated, Excellent Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2871-3539m DATE 7/2/83 PAGE 6

SWC ATTEMPTED 51 RECEIVED 48 MISSFIRES _____ NO RECOVERY 3

RUN No. Suite 3, Run 5 GEOLOGIST B. Via

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2945	3cm	Sandstone: Light Grey-White, Coarse-Very Coarse-Pebbly, Subrounded-Rounded, Moderate-High Sphericity, Poorly Sorted, Minor Silt As Matrix, Some Argillaceous Matrix, Very Friable to Unconsolidated Excellent Visual Porosity.	-	-	-	-
2933	3.5cm	Siltstone: Dark Grey, Massive, Hard, Slightly Calcareous, Very Sandy, Very Micaceous, Very Carbonaceous.	-	-	-	-
2925	2.5cm	Sandstone: Dark Grey, Very Fine to Very Coarse Grained, Very Poor Sorting, Angular-Subrounded, Very Silty, Non Calcareous, Weakly Cmented, Friable, Abundant Carbonaceous Material With Silty Fraction.	-	-	-	-
2900	2cm	Sandstone: Light Grey, Fine Grained to Conglomerate With 5mm Quartz Pebbles, Subangular to Subrounded, Moderate Sphericity, Poorly Sorted, Calcareous, Poorly Cemented, Silty-Argillaceous? Matrix, Friable, Fair-Good Visual Porosity, Very Micaceous, Glauconitic, Pyrite.	-	-	-	-
2895	3.5cm	Siltstone: Dark Grey, Massive, Moderately Firm-Hard, Non Calcareous, Very Carbonaceous, Mica, Sandy.	-	-	-	-
2879.5	2cm	Siltstone: Dark Brown, Massive, Firm to Moderately Hard, Silty to Sandy, Slightly Calcareous, Carbonaceous, Very Micaceous.	-	-	-	-
2875	3cm	Sandstone: Dark Grey, Fine Grained to Very Coarse-Pebbly, Subangular to Subrounded, Poorly Sorted, Slightly Calcareous, Very Carbonaceous, Silty-Argillaceous Matrix, Debris Flow.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 1

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2875	2.5cm	Sandstone: Clear to White, Translucent, Medium to Very Coarse Grained, Occasional Granules Larger than 2mm, Subangular to Subround, Poorly Sorted, Slightly Calcareous Cement, Occasional Mica-Muscovite?, Occasional Chlorite?, Occasional Glauconite Pellets, Good Visual Porosity.	-	-	-	-
2870	3.0cm	Sandstone: Clear to White, Translucent to Opaque, Bimodal 1) Medium Grained, Occasional Coarse Grained, Subangular to Subround, Fair Sorting, Moderate Sphericity 2) Granules Greater than 2mm, Subround to Round, Fair Sorting, Poor to Moderate Sphericity; Slightly Calcareous Cement, Abundant Mica-Muscovite?, Occasional Chlorite?, Trace Pyrite, Moderately Abundant Clauconite Pellets, Good Visual Porosity.	-	-	-	-
2865	2.5m	Sandstone: Clear to White, Translucent, Bimodal, 1) Fine to Medium Grained, Occasonal Coarse Grains, Subangular to Subrounded, Fair Sorting, Spherical, 2) Very Coarse Grains, Subangular to Round, Moderately Well Sorted, Poor to Moderate Sphericity; Slightly Calcareous Cement, Abundant Mica-Muscovite?, Occasional Chlorite?, Trace Pyrite, Moderately Abundant Glauconite Pellets, Good Visual Porosity.	-	-	-	-
2860.5	3.0cm	Sandstone: Light to Medium Grey, Coarse to Very Coarse Grained With Occasional Quartz Fragments Greater than 2mm, Angular to Subround, Poorly Sorted, Poorly Cemented, Friable, Micaceous, Moderately Glauconitic, Trace Pyrite, Good Visual Porosity.	-	-	-	-
2855	2.5cm	Sandstone: Grey, Medium to Very Coarse Grained, Angular to Subrounded, Poorly Sorted, Poorly Cemented, Friable, Clay Matrix, Slightly Calcareous, Abundant Mica, Moderate Glauconite, Fair to Good Visual Porosity.	-	-	-	-

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PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 2

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2852	2.5cm	Sandstone: Light Grey to Grey, Translucent to White to Opaque, Fine to Coarse Grained, Angular to Round, Poorly Sorted, Medium to High Sphericity, Loosely Cemented to Friable, Clayey Matrix, Moderately Abundant Mica, Trace Chlorite, Trace Glauconite, Trace Pyrite, Fair Visual Porosity, Non Calcareous Cement.	-	-	-	-
2848	3cm	Sandstone: Medium to Dark Grey, Coarse to Very Coarse Grained to Conglomerate, With Pebbles up to 0.5cm, Subangular to Subround, Moderate Sphericity, Poorly Sorted, Highly Calcareous, Poorly Cemented, Clay Matrix with Abundant Glauconite, Abundant Pyrite Locally as Cement, Trace Mica, Fair Visual Porosity.	-	-	-	-
2845	4.5cm	Siltstone: Dark Grey to Black, Massive, Silty to Sandy, Calcareous, Moderate to Abundant Glauconite, Moderate Mica, Poor Visual Porosity.	-	-	-	-
2844	4.0cm	Claystone: Dark Grey, Massive, Silty to Sandy, Calcareous, Moderate to Abundant Glauconite, Moderate Mica, Poor Visual Porosity.	-	-	-	-
2843	2.5cm	Sandstone: Poor Sample Mixed With Drilling Mud, Light Green, Medium to Very Coarse Grained, Angular to Subround, Poorly Sorted, Low to Moderate Sphericity, Loosely Cemented, Calcareous, Kaolinite in Matrix? Abundant Glauconite, Moderate Mica, Moderate Pyrite, Fair Visual Porosity.	-	-	-	-
2842	2cm	Sandstone: Poor Sample Mixed With Drilling Mud (Mudcake?), Light Green, Medium to Very Coarse Grained, Angular to Subround, Poorly Sorted, Low to Moderate Sphericity, Loosely Cemented, Calcareous, Kaolinite in Matrix?, Abundant Glauconite, Moderate Mica, Moderate Pyrite, Fair Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 3

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2840	3.0cm	Sandstone: Light Green to Grey, Salt and Pepper, Medium to Coarse Grained, Subangular to Subround, Moderately High Sphericity, Clay Matrix, Calcareous, Abundant Glauconite As Dark Green Dissiminations and Very Dark Green to Black Blobs, Mica, Trace Pyrite, Fair to Good Visual Porosity.	-	-	-	-
2838	3.5cm	Sandstone: Dark Greenish Grey, Medium to Very Coarse Grained, Angular to Subround, Poorly Sorted, Low to Moderate Sphericity, Silty to Clay Matrix, Calcareous, Very Abundant Glauconite As Green Dissiminations and Black Blebs, Poorly Cemented to Friable, Locally Abundant Pyrite Blebs, Trace to Moderate Mica, Fair Visual Porosity.	-	-	-	-
2834	4.5cm	Sandstone: Dark Grey to Greenish Grey Medium to Coarse Grained, Angular to Subround, Low to Moderate Sphericity, Poorly Sorted, Very Clayey Matrix Imparting a Sticky Nature to Rock, Calcareous, Abundant Glauconite, Trace Mica, Poor Visual Porosity.	-	-	-	-
2829	3.0cm	Sandstone: Dark Grey to Greenish Grey, Medium to Coarse Grained, Angular to Subangular, Low to Moderate Sphericity, Poorly Sorted, Very Clayey, Very Calcareous Matrix Imparting Sticky Nature to Rock, Abundand Glauconite, Trace Mica, Poor Visual Porosity.	-	-	-	-
2826	4.0cm	Sandstone: Dark Grey to Greenish Grey, Coarse to Very Coarse Grained, Subangular to Subround, Moderate Sphericity, Highly Calcareous, Highly Clayey Matrix, Abundant Glauconite Mainly as Black Blebs, Trace Planispherical Forams, Poor Visual Porosity.	-	-	-	-
2824	4.5cm	Mudstone: Dark Grey to Black, Subfissile to Blocky, Silty, Extremely Calcareous, Slightly Carbonaceous, Soft.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 4

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2822	2.0cm	Claystone: Light Grey to White, Moderately Firm, Moderately Silty, Very Calcareous, Moderately Abundant Glauconite Pellets, Occasional Mica, Poor Porosity.	-	-	-	-
2820	2.5cm	Claystone: Medium Grey, Massive, Very Calcareous, Moderately Silty, Abundant Glauconite in Blebs and Pellets, Poor Porosity.	-	-	-	-
2818	3.0cm	Claystone: Medium Grey, Massive, Sticky, Moderately Silty, Very Calcareous, Abundant Glauconite Pellets Poor Visual Porosity.	-	-	-	-
2815	3.5cm	Claystone: Medium Grey, Massive, Moderately Firm, Very Calcareous, Silty, Sticky, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2810	2.5cm	Claystone: Medium Grey, Massive, Homogeneous, Very Calcareous, Moderately Silty, Sticky, Very Glauconitic, Poor Visual Porosity.	-	-	-	-
2800	3.0cm	Claystone: Medium Grey, Homogeneous Very Calcareous, Moderately Silty, Very Calcareous, Abundant Glauconite Trace Pyrite, Rare Plant Fragments, Poor Visual Porosity.	-	-	-	-
2785	3.5cm	Claystone: Medium to Dark Grey, Homogeneous, Very Calcareous, Moderately Silty, Sticky, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2765	2.5cm	Claystone: Medium Grey, Homogeneous Moderately Silty, Very Calcareous, Occasional Pyrite, Occasional Glauconite, Poor Visual Porosity.	-	-	-	-
2745	2.0cm	Claystone: Medium Grey to Greenish Grey, Homogeneous, Moderately Silty, Sticky, Very Calcareous, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2725	2.5cm	Claystone: Medium Grey to Greenish Grey, Homogeneous, Moderately Silty, Sticky, Very Calcareous, Moderately Firm, Trace Glauconite, Poor Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 5

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2705	3.5cm	Claystone: Medium to Dark Grey, Homogeneous, Sticky, Moderately Firm, Moderately Silty, Very Calcareous, Occasional Glauconite Pellets, Poor Visual Porosity.	-	-	-	-
2635	3.5cm	Claystone: Medium Grey, Homogeneous, Slightly Silty, Firm, Moderately Sticky, Very Calcareous, Rare Forams, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2500	4.0cm	Claystone: Medium Grey, Homogeneous, Plastic, Very Clacareous, Slightly Silty, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2400	3.5cm	Claystone: Medium Grey, Homogeneous, Very Slightly Silty, Very Calcareous, Poor Visual Porosity.	-	-	-	-
2300	2.5cm	Claystone: Medium Grey, Homogeneous, Moderately Silty, Very Calcareous, Poor Visual Porosity.	-	-	-	-
2275	2.0cm	Claystone: Medium Grey, Homogeneous, Slightly Silty, Very Calcareous, Firm, Poor Visual Porosity.	-	-	-	-
2245	2.0cm	Claystone: Medium Grey, Homogeneous, Firm, Slightly Silty, Very Calcareous, Poor Visual Porosity.	-	-	-	-
2240	2.0cm	Claystone: Medium Grey, Homogeneous, Firm, Slightly Silty, Very Calcareous, Trace Glauconite, Poor Visual Porosity.	-	-	-	-
2237	2.0cm	Claystone: Grey, Homogeneous, Moderately Firm, Very Slightly Silty, Very Calcareous, Poor Visual Porosity.	-	-	-	-
2234	2.5cm	Claystone: Medium Grey, Homogeneous, Moderately Firm, Moderately Silty, Very Calcareous, Poor Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY
SIDEWALL CORE DESCRIPTION

WELL SEIENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 6

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
2232	2.0cm	Calcarenite: Medium Grey, Micritic Cement, Homogeneous, Trace Glauconite, Poor to Fair Visual Porosity.	-	-	-	-
2229	1 cm	Calcarenite: Light to Dark Grey, Micritic Cement, Homogeneous, Moderately Abundant Glauconite.	-	-	-	-
2225	1 cm	Calcarenite: Light Grey to Dark Grey, Firm to Hard, Homogeneous, Abundant Carbonaceous Specks, Occasional Glauconite Pellets, Poor Visual Porosity.	-	-	-	-
2215	1 cm	Calcarenite: Medium Grey, Homogeneous, Firm to Moderately Hard, Abundant Glauconite Pellets, Abundant Black Carbonaceous Specks, Poor Visual Porosity.	-	-	-	-
2115	2.5cm	Calcarenite: Light to Medium Grey, Abundant Micritic Cement, Becoming Calcilutite in Part, Firm to Hard, Abundant Glauconite Pellets, Occasional Carbonaceous Specks, Poor Visual Porosity.	-	-	-	-
2015	2.5cm	Calcarenite: Light to Medium Grey, Homogeneous Micritic Cement, Firm to Hard, Abundant Glauconite, Occasional Carbonaceous Specks, Poor Visual Porosity.	-	-	-	-
1915	2.5cm	Claystone: Medium to Dark Grey, Homogeneous, Firm, Very Calcareous, Slightly Silty, Poor Visual Porosity.	-	-	-	-
1815	2.0cm	Calcarenite: Light to Medium Grey, Abundant Micritic Cement, Firm, Homogeneous, Moderately Abundant Glauconite, Moderately Abundant Carbonaceous Specks, Poor Visual Porosity.	-	-	-	-
1715	2.0cm	Claystone: Light to Medium Grey, Homogeneous, Moderately Firm, Abundant Glauconite, Poor Visual Porosity.	-	-	-	-

PHILLIPS AUSTRALIAN OIL COMPANY

SIDEWALL CORE DESCRIPTION

WELL SELENE-1 INTERVAL 2848-2875m DATE 26/1/83 PAGE 7

SWC ATTEMPTED 51 RECEIVED 51 MISSFIRES 0 NO RECOVERY 0

RUN No. Suite 2, Run 4 GEOLOGIST VIA/SEE

DEPTH in metres	LENGTH RECVD	DESCRIPTION	ODOR	STAIN	FLUORESCENCE Brightness Colour	CUT Type Colour
1615	2.5cm	Calcilutite: Medium to Dark Grey, Homogeneous, Firm, Moderately Abundant Glauconite Pellets, Poor Visual Porosity.	-	-	-	-
1515	2.5cm	Calcilutite: Medium Grey, Homogeneous, Firm, Moderately Abundant Glauconite Pellets, Poor Visual Porosity.	-	-	-	-
1415	2.5cm	Calcilutite: Medium Grey, Homogeneous, Firm, Moderately Abundant Glauconite Pellets, Poor Visual Porosity.	-	-	-	-
1315	2.5cm	Calcilutite: Medium Grey, Homogeneous, Firm As Above.	-	-	-	-
1270	2cm	Calcilutite: Medium Grey, Homogeneous, Firm, Abundant Glauconite Pellets, Poor Visual Porosity.	-	-	-	-

APPENDIX NO. 5

CONVENTIONAL CORE DESCRIPTIONS

CONVENTIONAL CORE DESCRIPTIONS

REASON FOR CORING : After circulating up a significant drilling break, bright yellow streaming cut fluorescence was observed in the bottom samples, this led to decision to core.

CORE INTERVAL : Core 1 cut 15.6 metres (51.2 feet) between 3140.0 metres and 3155.6 metres; recovered 13.6 metres (44.62 feet).

Core 2 cut 7.0 metres (23 feet) from 3155.6 metres to 3162.2 metres; recovered 5.83 metres (19.13 feet). Decision to cut the second core was made after detecting cut fluorescence in sands in the bottom of Core 1.

GENERAL LITHOLOGY : Core 1 : Recovered from top to bottom, 7.5 metres (24.6 feet) of sandstone, .5 metres (1.64 feet) of coal, 4.0 metres (13.12 feet) of shale, 1.6 metres (5.52 feet) of sandstone.

Core 2 : Recovered from top to bottom, 3.2 metres (10.5 feet) of sandstone, 2.63 metres (8.63 feet) of interbedded sandstone and shale.

Sandstone : Light grey, medium-very coarse grained to pebbly, angular to subrounded, poorly sorted, minor silty matrix material and minor calcitic cement; excellent visible porosity.

Shale : Black, hard to very hard (some breaking with a conchoidal fracture), silty, non-calcareous, locally very fissile, with carbonaceous to coaly laminations, reworked sand interlaminations and fossil plant fragments.

Coal : Black to dark brown, lignitic in part.

DEPTH CORRELATION : Enclosure 7 illustrates core lithology with Schlumberger logs (gamma-ray, deep induction, density/neutron); drillers depths shown on left side of lithology column are 2.9 metres higher than Schlumberger depths.

SAMPLES : Location of samples for analysis by Auscore are shown on right side of lithology column (Enclosure 7), each sample represents about 3.5 inches of core per foot of sandstone; 9 were taken from Core 2, 32 from Core 1, samples were wrapped in saran-wrap, foil and dipped in molten plastic to prevent excessive fluid loss.

ANALYSES : Results shown on right side of diagram (Enclosure 7):

Porosity : up to 28.6%, average about 23%, scale increases from right to left.

Water/Oil Saturation : water increases right to left, oil left to right.

Permeability : increases logarithmically from right to left much of sand in Core 1 is over 1 darcy (average about 600 millidarcies); interconnecting pore spaces were visible in hand specimen; excellent reservoir rock.

Core Chip Sample Description, Core No. 1

3141.15m SANDSTONE: light grey, medium-to-coarse grained, angular to subround, mica-biotite, calcareous cement, friable, massive, light yellow fluorescence along edges of core, light blue-to-white cut, excellent porosity.

3141.35m SANDSTONE: light-to-medium grey, angular to subangular, well sorted, micaceous-biotite, minor calcite cement, friable, excellent porosity, minor pinpoint yellow fluorescence along edge and on non-fresh surfaces, light blue-white cut.

3141.70m SANDSTONE: light grey, medium-to-fine grained, angular to subround, well sorted, micaceous-muscovite and biotite, non calcareous cement, friable, good porosity, minor pinpoint yellow fluorescence, slow blue-white cut.

3141.90m SANDSTONE: grey to light green, fine-to-medium grained, subangular to subround, poorly sorted, silty matrix, chloritic, micaceous-biotite, lithic fragments, carbonaceous, argillaceous laminae, non calcareous, firm, poor visual porosity, pinpoint yellow fluorescence from carbonaceous material, no cut.

3142.10m SANDSTONE: light grey, medium grained, subangular to subround, well sorted, micaceous-muscovite and biotite, non calcareous cement, friable, good visual porosity, very minor yellow pinpoint fluorescence, very faint blue-white cut.

3142.30m SILTSTONE: medium-dark grey, moderately soft, non-calcareous with trace carbonaceous material as secondary coatings, sandy, micaceous, no fluorescence, very pale white cut.

3142.50m SANDSTONE: grey, fine-to-medium grained, poorly sorted, subangular to subrounded, moderate sphericity, non-calcareous, silty-to-very fine grained sandy matrix, very friable, abundant biotite, good visual porosity, trace pinpoint fluorescence, no cut.

3142.65m SANDSTONE: grey, fine-to-medium grained, poorly sorted, subangular to subround, moderate sphericity, minor secondary calcite?, very friable, no fluorescence, no cut.

3142.90 SANDSTONE: grey, fine-to-medium grained, subangular to subrounded, moderate-to-low sphericity, moderate sorting, very clean, minor silty matrix, non calcareous, abundant mica; good-to-excellent visual porosity, trace pinpoint fluorescence, minor streaming yellow cut, residual fluorescence after cut dried.

3143.35m SANDSTONE: grey, medium-to-coarse grained, subangular to subrounded, moderate-to-high sphericity, poorly sorted, salt and pepper, minor silty matrix, minor calcareous (dolomite?) cement, very friable, abundant mica, good-to-excellent visual porosity, no fluorescence, no cut.

3143.55m SANDSTONE: grey to dark grey, medium-to-coarse grained, subangular to subrounded, low-to-high sphericity, non-calcareous, salt and pepper, minor silty matrix, very clean, abundant mica, good visual porosity, no fluorescence, no cut.

3143.80m SANDSTONE: light grey, medium-to-coarse grained, subangular to subrounded, moderately low-to-high sphericity, salt and pepper, poorly sorted, minor matrix material, non-calcareous, very friable, abundant mica, good-to-excellent porosity, no fluorescence, slight pale yellow-white cut, residual fluorescence after cut dry.

3144.10m SANDSTONE: light grey, medium grained, angular to subrounded, poorly sorted, moderately low-to-moderately high sphericity, non-calcareous, very clean, abundant mica, some salt and pepper, good-to-excellent visual porosity, no fluorescence, no cut.

3144.35m SANDSTONE: light grey, medium grained, subangular to subrounded, fair sorting, moderately low-to-moderately high sphericity, non-calcareous, very clean, very friable, abundant mica, good-to-excellent visual porosity, no fluorescence, no cut.

3144.55m SANDSTONE: light grey, medium-to-coarse grained, subangular to subrounded, moderately low-to-high sphericity, non-calcareous, fair sorting, very clean, very friable, salt and pepper, abundant mica, good-to-excellent visual porosity, no fluorescence, pale yellow cut fluorescence.

3144.85m SANDSTONE: light-to-medium grey, medium-to-coarse grained, subangular to subrounded, moderately low-to-high sphericity, non-calcareous, fair sorting, very clean, very friable, salt and pepper, abundant mica; excellent visual porosity, no fluorescence, no cut.

3145.10m SANDSTONE: light grey to grey, medium-to-coarse grained, subangular to subrounded, moderate sphericity, non-calcareous, fair sorting, very clean, very friable, salt and pepper, abundant mica, excellent visual porosity, no fluorescence, pale yellow-white cut.

3145.30m SANDSTONE: medium-to-dark grey, medium-to-coarse grained, subangular to subrounded, moderate sphericity, calcareous, fair sorting, clean, friable, salt and pepper, abundant mica, good to excellent visual porosity, no fluorescence, no cut.

3145.50m SANDSTONE: medium-to-dark grey, medium-to-coarse grained, subangular to subrounded, moderate sphericity, fair to well sorted, clean, non-calcareous, salt and pepper, friable, mica, good to excellent visual porosity, no fluorescence, no cut.

3145.75m SANDSTONE: medium-to-dark grey, medium-to-coarse grained, subangular to subrounded, low to high sphericity, fair sorting, salt and pepper, clean, friable, abundant mica, some chlorite, good-to-excellent visual porosity.

3147.50m SANDSTONE: dark grey, fine-to-coarse grained, subangular to subrounded, poorly sorted, low-to-high sphericity, silty matrix, non-calcareous, salt and pepper, friable, abundant mica, mainly biotite, imparts dark colour; good visual porosity, no fluorescence, no cut.

3148.10m SANDSTONE: dark grey, medium-to-coarse grained, subangular to subrounded, poorly sorted, low-to-high sphericity, silty matrix?, calcareous, salt and pepper, friable, abundant mica, good visual porosity, no fluorescence, pale yellow cut fluorescence.

3148.35m SANDSTONE: dark grey, fine-to-medium grained, subrounded, non-calcareous, silty to argillaceous matrix, carbonaceous, moderate to poorly cemented, abundant mica with interlaminated carbonaceous siltstone/shale, non-calcareous, hard, micaceous, fair-to-poor visual porosity, no fluoresence, no cut.

3148.65m SANDSTONE: light grey, fine-to-medium grained, poorly sorted, subangular to subrounded, salt and pepper, biotite, silty argillaceous laminations, firm, poor-to-fair porosity, no fluorescence, no cut.

3148.80m SANDSTONE: medium grey, medium grained, poorly sorted, subangular to subrounded, silty matrix, firm, fair porosity, minor purple fluorescence, no cut.

3149.10m SANDSTONE: medium grey, fine grained, poorly sorted, subangular to subrounded, argillaceous cement, salt and pepper, micaceous, poor porosity, no fluorescence, no cut.

3153.93m SANDSTONE: light grey, very coarse grained to granular, moderate sorting, subangular to subrounded, minor calcareous cement, friable, good porosity, no fluorescence, streaming yellow-to-white cut.

3154.25m SANDSTONE: light grey, coarse-to-very coarse grained, poorly sorted, subangular to subrounded, poorly sorted, silty matrix, minor mica, minor calcareous cement, friable, no fluorescence, slow pale white cut.

3154.60m SANDSTONE: light grey, very fine grained, poorly sorted, subangular to subrounded, poorly sorted, chloritic, biotite laminations, argillaceous cement, firm, very minor pinpoint fluorescence, no cut.

3154.75m SANDSTONE: conglomerate, light grey, very coarse grained to pebbly, poorly sorted, subangular to subrounded, good sphericity, fair sorting, pyrite cement, hard, minor purple fluorescence, faint slow pale white cut.

3154.95m SANDSTONE: conglomerate, light grey, very coarse grained to pebbly, poorly sorted, subangular to subrounded, fair sphericity, poorly sorted, silaceous, minor calcareous cement, moderate cement, friable, no fluorescence, streaming pale yellow cut from edge and centre of core.

3155.25m SANDSTONE: light grey, medium-to-coarse grained, poorly sorted, subangular to subrounded, fair sphericity, siliceous and minor calcareous cement, moderate cement, minor pyrite, no fluorescence, no cut.

Core Chip Sample Descriptions, Core No. 2

3157.65	SANDSTONE:	medium grey, fine grained, poorly sorted, subangular to subrounded, argillaceous cement, salt and pepper, mica, poor porosity. No fluorescence, no cut.
3158.05m	SANDSTONE:	light grey, very coarse grained to granular, moderate sorting, subangular to subrounded, minor calcareous cement, friable, good porosity, no fluorescence, streaming yellow-white cut.
3158.40m	SANDSTONE:	light grey, coarse-to-very coarse grained, poorly sorted, subangular to subrounded, poorly sorted, silty matrix, minor mica, minor calcareous cement, friable, no fluorescence, slow pale white cut.
3159.35m	SANDSTONE:	light grey, very coarse grained to pebbly, poorly sorted, subangular to subrounded, fair sphericity, poorly sorted, siliceous and minor calcareous cement, moderate cement, friable, no fluorescence, streaming pale yellow cut from edge and centre of core.

SELENE NO. 1

PRELIMINARY CORE ANALYSIS - CORE NO. 1

DEPTH	POR.	GR. DEN	K	OIL	H2 0
3141.15	26.4	2.57	5591	0.8	55.4
3141.35	27.4	2.65	2207	-	69.7
3141.70	21.2	2.68	183	-	94.8
3141.90	11.8	2.65	1	2.0	81.5
3142.10	22.1	2.68	260	0.5	74.9
3142.30	15.5	2.62	44	1.5	76.6
3142.50	21.1	2.66	226	0.5	74.6
3142.65	22.2	2.70	241	0.5	76.6
3142.90	22.3	2.68	391	-	64.1
3143.35	22.6	2.62	549	2.0	62.1
3143.55	24.7	2.58	3127	-	71.5
3143.80	27.3	2.68	2718	-	58.1
3144.10	24.7	2.67	1197	-	82.2
3144.35	26.5	2.70	1875	-	84.7
3144.55	27.4	2.71	2663	-	81.9
3144.85	26.1	2.66	3330	-	81.4
3145.10	25.4	2.67	2628	-	74.8
3145.30	24.1	2.63	2031	-	87.1
3145.50	27.3	2.67	3569	-	82.6
3145.75	25.5	2.63	2982	-	78.2
3147.50	18.2	2.70	14	-	66.7
3148.10	21.0	2.69	83	-	70.3
3148.35	16.7	2.70	10	3.5	66.5
3148.65	22.0	2.72	172	2.1	50.5
3148.80	23.3	2.70	100	1.0	70.9
3149.10	17.4	2.72	11	1.4	78.2
3153.93	16.4	2.66	654	1.4	88.4
3154.25	15.9	2.64	882	1.5	86.8
3154.60	11.6	2.86	0.31	-	94.1
3154.75	10.2	3.26	220	-	90.6
3154.95	22.4	2.69	3902	-	82.1
3155.25	28.6	2.87	1759	-	49.4

SELENE NO. 1
PRELIMINARY CORE ANALYSIS - CORE NO. 2

DEPTH	POR.	GR. DEN	K	OIL	H2 O
3157.65	17.7	2.60	766	-	90.8
3158.05	15.4	2.56	244	-	93.5
3158.40	15.2	2.54	722	-	86.2
3159.35	18.2	2.66	1461	-	76.2

WELLSITE CORE DESCRIPTION SHEET

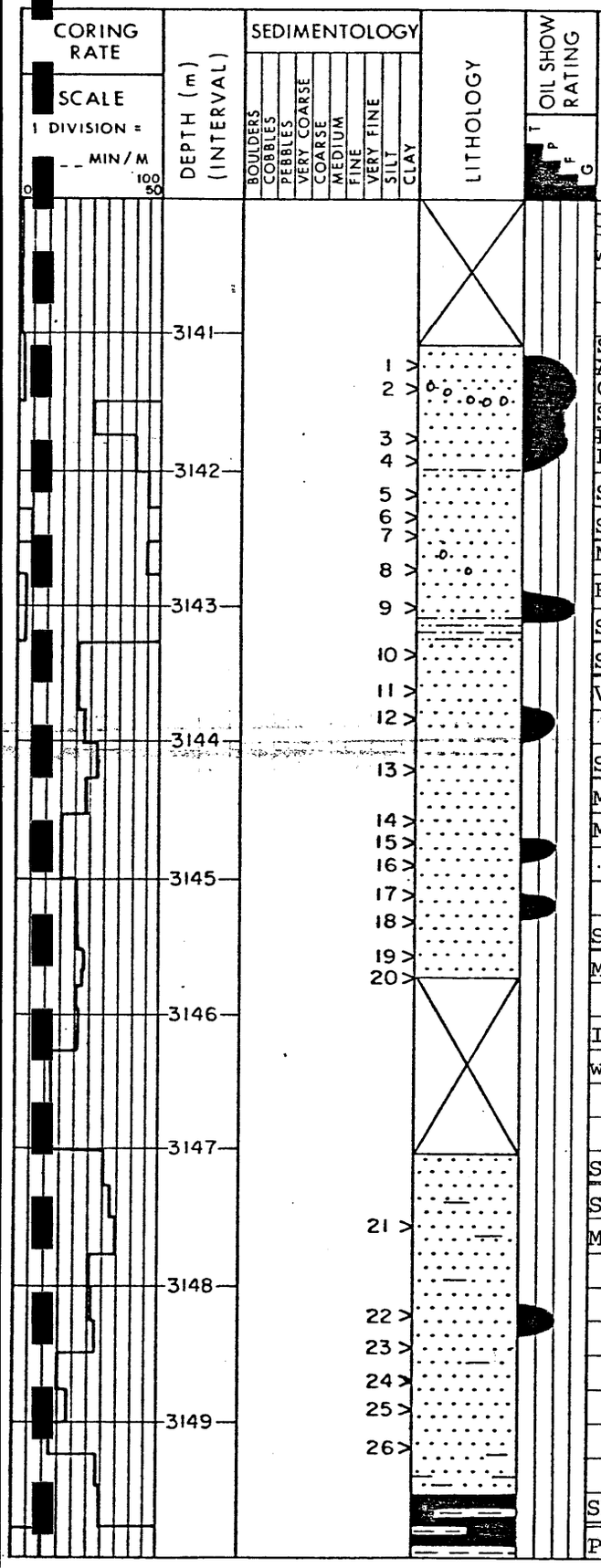
WELL SELENE-1

CORE No. 1 PAGE 1 OF 2

INTERVAL FROM 3140 m TO 3155·6 m. CUT 15·6 m.

SIZE AND TYPE OF CORE HEAD 8½" ACCRM FLUSH RECOVERED 13·6 m. % REC 90

DATE 1 FEB 1983 SCALE 1:100 DESCRIBED BY G.R.YARROW & W.N.VIA



LITHOLOGIC DESCRIPTION	SHOW DESCRIPTION
Inferred Missing Due to Correlation	
with Penetration Rates.	
Sst:Lt.Gry,Med-CrsGrn,Pbl at Base,	Mnr Pinpoint Fluor
~~Ang-Sbrndd,Mica&Bio,MnrCalc Cmt, Scour~~	~~Lt.Blue - Wh Cut~~
Channel at Base	
Sst:Lt.Gry-Grn,F-MedGr,Ang-Shrndd,S&P	Mnr Pinpoint Fluor
~~PrSrt,Carb-Argil,Flaser Bdg in Lower~~	~~Slow Blur Wh Cut.~~
Pt.	
Sltst: MedGry,Hd,Sharp U&L Contact	
Sst:Gry,F-MedGr,Pr Srtd, Sbang-Sbrndd,	
Mod Sph, Mica&Bio, Slty Mtrx, Flaser	
Bgd in Top Part.	
Sltst:MedGry,Mica,Argill,Hd,Foss Plant	Frags
Sst:Gry,Med-CrsGr,Sbang-Sbrndd, S & P,	No Fluor
V Mic, Slt, Mtrx	
	Sl-Yell Wh Cut
Sst:Lt-MedGry,Med-Crs Gr,Sbang-Sbrndd,	
ModSph,NonCalc, V Fri, S&P, Abd	
Mica, V. Clean	No Fluor, Pale Yell Wh Cut
Sst: Med-DrkGry, M-CrsGr, Sbang-Sbrndd,	No Fluor, No Cut
Mod Sph, Mnr CalcCmt, Mic, Fri	
Inferred Missing Due to Correlation	
with Penetration Rates	
Sst: Med-Drk-Gry, F-Med-Gry, Pr Srt,	
Sbang-Sbrndd, Mica, Bio, Slty,	No Fluor
Mtrx, Carb Lam.	
	Pale Yell Cut
Sh: Coaly, DK-Gry-Blk, Hd, Foss	
Plant Frags.	

A-5662

WELLSITE CORE DESCRIPTION SHEET

WELL SELENE-1

CORE No. 1 PAGE 2 OF 2

INTERVAL FROM 3140 m TO 3155·6 m. CUT 15·6 m.

SIZE AND TYPE OF CORE HEAD 8/" ACC RM FLUSH RECOVERED 13·6 m. % REC 90

DATE 1 FEB 1983 SCALE 1:100 DESCRIBED BY G.R.YARROW & W.N.VIA

CORING RATE SCALE 1 DIVISION = __ MIN/M 0

DEPTH (m) (INTERVAL)

SEDIMENTOLOGY: BOULDERS, COBBLES, PEBBLES, VERY COARSE, COARSE, MEDIUM, FINE, VERY FINE, SILT, CLAY

LITHOLOGY

OIL SHOW RATING: T, P, F, G

LITHOLOGIC DESCRIPTION	SHOW DESCRIPTION
Sh: DK-Gry, W/Floating Sd Gr and Foss Plant Frags.	
Sst:LtGry,Crs-VCrsGr,MnrCalcCmt, Fri,	No Fluor, Streaming to Slow
Cong-Sst: as Below	YellWhtoPale Wh Cut
Sst: F-VF-Gr, Bio, Argill Lam	Mnr Pinpoint Fluor No Cut
SstCong: Lt.Gry,VCrs-Pbl,Pr-Srt,Sbang-	No Fluor, Streaming to Faint Pale
shrndd, Sil & Pyr Cmt	Yellow to Pale wh Cut
Sst-Cong: Med-LtGry,Med-Crs-Gry,Pr Srt,	No Fluor, No Cut
Sil-Cmt, Mnr Pyr.	

3151 3152 3153 3154 3155

27> 28> 29> 30> 31> 32>

A-5662-

WELLSITE CORE DESCRIPTION SHEET

WELL SELENE -1

CORE No. 2 PAGE 1 OF 1

INTERVAL FROM 3155·6 m TO 3162·5 m. CUT 7·0 m.

SIZE AND TYPE OF CORE HEAD 8½" ACCRM FLUSH RECOVERED 5·83 m. % REC 90

DATE 2 FEB 1983 SCALE 1:100 DESCRIBED BY G.R. YARROW & W.N. VIA

CORING RATE SCALE 1 DIVISION = MIN/M 0 300 200 100

DEPTH (m) (INTERVAL)

SEDIMENTOLOGY: BOULDERS, COBBLES, PEBBLES, VERY COARSE, COARSE, MEDIUM, FINE, VERY FINE, SILT, CLAY

LITHOLOGY

OIL SHOW RATING: T, P, F, G

LITHOLOGIC DESCRIPTION	SHOW DESCRIPTION
Sst: Lt-Gry, Cong, V-Crs-Pbly, F-Med	No Fluor, No Cut
Gr Sd Mtrx, Sbang-Sbrndd, Pr Srt,	
ModSph, SiliyCalcCmt, Fri, MnrKaoinMtrx,	Mic.
Sst: As Below W/IncrVFGr-Slty, Random Oriented	Carb Lami.
Sst: LtGry. Congl, VCrs-Pbly, Sbang-Sbrndd	No Fluor
Pr-ModSrt, ModSph, Slily CalcCmt, Fri.	Inst. Yellow Wh W/
F-Med Gr-Sd Mtrx, Mica, Complete Lack	Slow Streaming Yel
of Bdg, Abrupt Basal Contact, Non	Cut
Perpendiculur to Core.	
Sh: Blk, Hd, VFiss, Carb In Pt, Foss Plant	None
Frags, Turbulent Reworked Sd, Laminated Base, 1-3mm Coal in U20cm	
Sst: Gry, VF-FGr, SlilyMic, Carb Streaks, Fri.	
Sh: Slk, Hd, Slty, W/CoalInterbd Lamn to 2cm	
in Upper 50cm, Reworked Turbulent Sd in	
Grad Basal Contact.	
Sst: MedGry-Grn, FGr, Slily Firm but Fri,	
F Lamn Carb Mat, Argill, Slil, Pyr in Top 5cm	
Sh: Hd, Brittle, Pyr at Base, 1-5mm Reworked	
Carb Lamn, Mnr Calc Vugs?	

A-5662-A

APPENDIX NO. 6

PETROGRAPHIC DESCRIPTIONS

ANALABS
A Division of Macdonald Hamilton & Co. Pty. Ltd.
ANALYTICAL CHEMISTS

• PERTH:
52 MURRAY ROAD,
WELSHPOOL, WESTERN AUSTRALIA, 6106
TELEPHONE (09) 458 7999, 458 7154
TELEX: ANALAB AA 92560
P.O. BOX 210, BENTLEY, W.A. 6102

PT/fjc
21st March, 1983.

Mr. Peter M. Barber,
Senior Geologist,
Phillips Australia Oil Co.,
23rd Floor City Centre Tower,
44 St. George's Terrace,
PERTH WA. 6000.

Dear Peter,

Enclosed please find the results of the petrographic analyses performed on samples from the Selene No. 1 Well.

Should you have any questions concerning the data, or if we may be of further service, please contact us.

Yours faithfully,

Paul Tybor

PAUL TYBOR
Operations Manager

Enc.

General Comments

1. Lithology - Provenance

These sedimentary rocks are similar, being immature, poorly sorted microcline quartz arenites, arkoses or feldspathic sandstones. Some contain sufficient volume of rock particles to justify the lithic prefix. Sample 3345 is an exception, having a well sorted fine sandstone fabric.

The composition of these rocks indicates a granitic source for their dominant clastic component. The fresh nature of their feldspars suggests a short detrital history. The microcline perthite type is typical of granites. The high K felspar / quartz clast ratio is also support for an adjacent granitic terrane.

The rounding of the coarsest quartz implies some current activity, unless these are reworked from other sediments. The rounding of zircon is probably an intrinsic characteristic. The schorl-type tourmaline is angular.

The occasional presence of glauconite plus pyrite reflects anerobic marine conditions, but their low modal % shows this to be a minor phenomenon, perhaps a brief incursion into a delta or land locked basin. It is assumed neither could be reworked. The arenites are not entirely homogenous containing a variety of rock fragments, not granites because of the coarseness of the latter.

2. Porosity - Permiability

Being sidewall cores, some if not all of these samples have suffered extensive fracturing during sampling. This causes difficulties with assessment of grainsize, shape etc and negates comments on porosity / permiability.

3. Diagenesis

The main diagenetic process is considered to be mechanical rather than chemical.

Compaction has resulted in bending of micas around clasts, and some accommodation of quartz and feldspar clasts, although grain to grain content is not common for the sand sized materials.

General Comments cont.

The matrix is considered to be dominated by a silt-clay detrital component, rather than a precipatated mineral cement. Authigenic activity was at a minimum. No overgrowths are visible on quartz. There is a slight rim to some of the larger K feldspars that could be interpreted as one. Xray diffraction identified some Kaolin in samples 2925 and 3105. Some if not all of this, is presumed to be derived from the alkali feldspar, but overall the feldspar was fresh.

Sample 2900

Lithology		Silty feldspathic arenite
Sorting		Poor
Grainsize		Silt to medium sand, rarely coarse
Grain Shape		Subrounded coarse sand to subangular fine sand and silt
Constituents		(with estimated modal %)
Quartz 35-40%	-	Mainly monocrystalline, subangular, undulose extinction, fracturing of coarser grains common grainsize range 1mm to less than 50 microns, average below 0.5mm, polycrystalline quartz rare.
K Feldspar 25-30%	-	Microcline perthite; Two crystals 1.5mm, subrounded. Rest below 0.5mm, subrounded to cleavage fragments or broken equivalent. Alteration of feldspar slight or negligible - slight spotting or rare chlorite development in fracture.
Plagioclase 3-5%	-	Largest crystal 0.5mm, twinned with flexuring, spotting of white mica, also composite with altered alkali feldspar. Most plagioclase under 0.2mm.
Glauconite 1-2%	-	Sparsely scattered semi-rounded (0.3mm) (?pelletal) to angular allotriomorphic smaller particles, average 0.1mm. Confirmed by SEM.
Micas 3-4%	-	Biotite, strong absorption shows iron-rich variety (lepidomelane). Flakes typically 0.2 x 0.02mm concentrated in silty part, with fair degree of orientation, curvature around detritus common. Muscovite similar but less abundant. Alteration of biotite to chlorite visible.
Chlorite 1%	-	A few probable detrital flakes of under 0.1mm, more present as replacive mineral.
Rock Fragments 1%	-	Granitic (quartz in microcline), quartzite (cherty).

Sample 2900 cont

Heavy Minerals 2-3%	-	Tourmaline, exceptionally angular 0.2mm, orange yellow variety, others under 0.1mm. Opaque material 1% of slide, majority is ragged 30 - 50 micron including pyrite. Some seen crossing clastic quartz boundary. Zircon and monazite rare.
Detrital Matrix 20%	-	Brownish coloured mixture of silty quartz and feldspar with micas rather than clays as cementing medium or more probably alteration product. Brown colour indicates fine divided biotite or hydrobiotite common. It is accompanied by colourless mica, probably sericite-muscovite, and a little chlorite. Reaction with a replacement of feldspar and quartz seems unimportant.
Authigenic Activity	-	See general comments

Sample 2925

Lithology	Feldspathic arenite
Sorting	Poor
Grainsize	Coarse to fine sand, silt.
Grainshape	Subrounded, subrhombic to subangular
Constituents	(with estimated modal %)

Quartz 30-50% - Monocrystalline, has a distinctly bimodal size distribution, 1mm rounded strained quartz, and 0.5mm subangular plus 0.1 - 0.2mm rounded to subangular unstrained. the rounded grains are not rare.

K Feldspars 30-40% - Perthite, only a few have microcline twinning. Shapes rhombic tabular several 1.5mm, majority are under 0.3mm with subrounded tablets. Majority show little evidence of alteration.

Plagioclase 3-5% - A few small (0.1mm) twinned subeuhedral fresh crystals.

Micas 1-2% - Single clean flakes of dark brown + ?green biotite rare, exceptionally 0.5mm muscovite a little commoner. Parts of matrix appear replete with 'degenerate' dark mica. 0.5mm narrow muscovite cuts feldspar rhomb.

Glauconite < 1% - A few isolated 50 micron microaggregates.

Heavy Minerals 1% - Tourmaline, orange yellow dichroism, exceptionally blue angular 0.1-0.2mm only heavy of significance. Opaques, some probably detrital, but extensive secondary material. Rare zircon.

Rock Fragments 1% - Fine quartzite, quartz feldspar granite, mica-rich pelitic schist, aphanitic volcanic - none common.

Detrital matrix 10-30% - The bulk of the matrix to the clasts is considered to be detrital in origin, i.e. diagenesis has been limited to recrystallization. The ubiquitous brown colour in polarised light is apparently due to microflakes of biotite plus some iron staining associated with the abundant opaques.

Although Kaolin in present (XRD), the bulk of the potash feldspars are not altered, even at

Sample 2925 cont

Detrital matrix 10-30% - matrix dimensions. Likewise quartz shows little evidence of attack.

Authigenic activity- See general comments

Sample 2945

Lithology	Lithic feldspathic arenite
Sorting	Good (partly obscured by sampling fragmentation)
Grainsize	Coarse dominant (0.5 - 2mm)
Grain Shape	Rounded (coarse sand) to angular (fine sand/silt) (including extraneous fragmentation)
Constituents	(with estimated modal %)
quartz 60-70% -	Monocrystalline 0.5 - 1mm rounded crystals represent the bulk of the quartz present. Several polycrystalline quartzes were otherwise identical to the above. Between a third and half these coarse sand grains have been fractured, in one of the two core pieces sliced. The intervening matrix contains 0.05-0.1mm very angular quartz, possibly a result of this insitu brecciation.
K Feldspar 15-25%	Microcline perthite, fresh subrounded 0.5mm crystals, some semi-tabular. Small cleavage fragments of 0.1-0.2mm, very little of fine or very fine sand size. Most coarse material fresh, some veins filled by ? Kaolin. Several have a clear inclusion free rim which may be the result of incipient matrix reaction. Plagioclase not identified.
Rock Frements - 3-5%	Quartzite (metamorphic), granite (two feldspar), quartz vein (some tourmaline and feldspar, or purely quartz). These are of similar size and shape to the coarse quartzes.
Limonite 0-20% -	One core piece contains extensive fragments heavily impregnated with limonite - goethite. The 0.5mm fragments have a banding or bedding due to more opaque layers. Silicates cannot be identified, but they are assumed to be sediments.
Micas < 1% -	Negligible at sand dimensions
Heavy Minerals - < 1%	Only visible as inclusions in coarse silica, (tourmaline and zircon)
Detrital Matrix 10% -	(excluding limonite) The two chips both have abundant very fine carbonate in their cement, identified in 2980 as calcite. This carbonate is intermingled with silicates, sub 5 micron quartz, alkali feldspar and probably a little Kaolin. The presence of barite shows that this fine calcite is probably a major component of drilling mud
Authigenic Activity -	See general comments

Sample 2980		Various .5 - 1cm fragments
Lithology		Lithic feldspathic arenite
Sorting		Poor
Grainsize		Coarse dominant (0.5 - 2mm), (much of finer material result of extraneous fracturing)
Grain Shape		Subrounded (coarse sand) to angular (fine sand to silt)
Constituents		(with estimated modal %)
Quartz 60-70%	-	Monocrystalline and polycrystalline rounded 1mm crystals. Subordinate angular finer quartz to 0.05m. Some fracturing of the millimetric quartz.
K Feldspar 15-20%	-	Microcline perthite, 0.5 - 2mm subrounded. Areas of 0.05 - 0.1mm cleavage fragments. Alteration negligible, larger crystals have possible reaction rim with matrix.
Plagioclase 1%	-	one deformed twinned 0.3 x 0.3mm mass. Otherwise as inclusions in K feldspar.
Opaques 1%	-	One sulphide (0.75mm) ? pyrite, plus 0.1-0.2mm oxidised ? pyrite common in several fragments.
Micas 1%	-	One 0.3mm cluster of orange brown flakes in one fragment, partial chloritization. Several biotite and muscovite flakes included in coarser quartz / feldspar.
Rock Fragments 3-5%	-	1. Limonite impregnated siltstone, also semi-opaque limonite / goethite banded rock (cf 2945).
		2. Dolomite cemented fine feldspathic sandstone (0.5mm) - 0.2mm enclosing angular quartz and K feldspar, 50% by volume.
		3. Aphanitic microcrystalline chlorite rock heavily impregnated with leucoxene. This forms a 4mm length mass, which has been compressed around adjacent quartz fragments probably due to compaction. the limonitic silt clast has likewise experienced this.

Sample 2980 cont

Heavy Minerals < 1% - Excluding opaques, are negligible. Barite was detected with the SEM, and is assumed to be from injection of drilling mud.

Detrital Matrix - The various chip fragments show marked variation in the quantity and nature of the matrix / cement. Some are rich in very fine (10 microns) carbonate, identified by the SEM as CaCo3.

In view of the presence of barite in other calcite matrices here, it is assumed that this is drilling mud. Others are a fine grey mosaic of quartz, K feldspar and probable Kaolin. These patches have a clast texture suggesting fragmentation as a result of sampling. Alteration or replacement of the matrix seems negligible.

Authigenic Activity See general comments

Sample 3105

Lithology	Lithic Feldspathic arenite
Sorting	Poor
Grainsize	Coarse to fine sand, silt
Grain Shape	Subrounded (large quartzes) to subangular and angular
Constituents	(with estimated modal %)

Quartz 35-40% - Monocrystalline, with undulose extinction dominant. Subangular 1mm to less than 50 microns, average about 0.2mm. Fractures common. Coarse polycrystalline due to stress.

K Feldspar 35-40% - Microcline perthite plus several low 2V rhombs (sanidine or anorthoclase). Size range from 0.5 to 0.05mm. Shapes subangular to semi-rhombic with rounded edges. Overall are fresh.

Plagioclase 2-3% - Negligible compared with K feldspar. Several fresh 0.1mm albite twinned rhombs.

Micas 1% - Biotite is relatively coarse and distorted, in 0.5mm clusters, some with extensive opaque inclusions, others partly chloritised or interlayered with muscovite. Moscovite of similar quantity and disposition.

Heavy Minerals < 1% - Confined to rare tourmaline to 0.1mm, and fine zircon.

Rock Fragments - The principal type is a fine grained quartzite which may have a lineation, i.e. is metamorphic. One contains extensive leucoxene. Fragments are in the 0.2 - 0.3mm range. An uncommon fragment has a graphic granite texture. There may be several feldspar-rich volcanic rocks.

Detrital Matrix 15-20% - Separation of matrix from clasts is difficult because of apparent gradation. Quartz and feldspar fragments can be identified to below 10 microns. (In view of the fragmentation visible in other slides as the result of sampling, this material could be of like origin).

Evidence of non-detrital clays / micas is limited to sericite spotting of alkali feldspar. The effect of compaction is evident in the wrapping around of clastic feldspar / quartz by the occasional biotite mass. This biotite

Sample 3105 cont

	is perfectly fresh. Replacement by authigenic minerals of K feldspar, or quartz is not usually visible. There are areas of opaque material acting as a cement or matrix is silica clasts. This is partly sulphide (?pyrite), molded in one instance around quartz. other fine cubes of ? pyrite can be heavily disseminated within biotite or its chloritised equivalent. These are also 'cementing' quartz fragments.
Authigenic activity	See general comments

Sample 3345

Lithology		Feldspathic arenite
Sorting		Well (excluding silty patches)
Grainsize		Fine to very fine sand
Grain Shape		Sub-angular to angular
Constituents		(with estimated modal %)
Quartz 60-55%	-	Monocrystalline dominant. Grainsize range normally 0.05 - 0.15mm, i.e. fine to very fine sand. Shapes mostly angular.
K. Feldspar 20-25%	-	Microcline, dimensions similar to quartz, shapes subrhombic to subangular. Freshness variable over slide.
Plagioclase < 1%	-	Very subordinate to K feldspar, only fine sand size.
Micas 2-3%	-	Biotite and muscovite about equal, the strongly absorbent biotite usually wrapped around adjacent quartz feldspar grains, or infilling space between three grains. Interlayering with secondary chlorite visible. Biotite / chlorite flakes show parallellism when more concentrated. Some flake lengths exceed 0.5mm.
Opaques 1-2%	-	Sulphides, probably pyrite form small (50 microns) cubes in matrix, feldspar or micas. Other translucent opaques may be oxidised pyrite, now goethite.
Heavy Minerals < 1%	-	Negligible tourmaline, strong zoned dichroism evidence of breakdown.
Rock Fragments ?	-	Numerous microcrystalline particles may be classified as rock fragments, but are difficult to separate from matrix or altered silicate e.g. feldspar. Some evidence of feldspar-rich volcanics (plagioclase - spherulitic texture), also chert.
Detrital Matrix 5-10%	-	Dominated by colourless micas. In many cases, these are seen as degraded micas, either bleached biotite or disintegrated muscovite, to a sericite - illite matrix, wrapped around the quartz-feldspar clasts. There are a few traces of microcrystalline carbonate (cf 2945) probably derived from drilling mud,

Sample 3345 cont

The alteration or replacement of K feldspar, or replacement of quartz clasts by matrix a cement is only minor.

Authigenic Activity — See General comments.

Sample 3461

Lithology		'Fractured' Feldspathic arenite
Sorting		Fair
Grainsize		Coarse to medium sand (excluding extraneous fracture products)
Grain Shape		Subrounded (sand) to angular ('silt')
Constituents		(with estimated modal %)
Quartz 50-55%	-	Monocrystalline subrounded or angular 1.0mm. There is continual gradation down to below 50 microns. This is partly due to extensive fracturing of layer grains, which may produce an imbricate fabric. The cement to these fractures can be very fine silica rather than clay.
K Feldspar 30-35%	-	Microcline perthite as subrounded millimetric crystals, cf quartz. 0.5 - 0.3mm more rhombic, fracturing common, resulting in minus 50 micron debris as matrix to coarser clasts.
Plagioclase <1%	-	Negligible, unless untwinned in matrix.
Rock Fragments 3-5%	-	Mainly quartzite / chert. Angular 0.5mm, metamorphic quartzite, or microcrystalline chert. One 1.0mm x 0.4mm muscovite - quartz - chlorite shale piece
Micas 1%	-	Negligible, apart from two ragged muscovites plus biotite. It also occurs as inclusions in quartz.
Heavy Minerals 1%	-	Negligible if opaques regarded as secondary
Others 1%	-	There are several small green patches, interpreted as chlorite rather than glauconite.
Detrital matrix 10%	-	The influence of the artifical fracture makes separation of primary matrix/cement from secondary difficult. There appears to be a complete gradation of angular quartz and feldspar fragments down to the resolving power of the microscope optics. The alkali feldspar shows little evidence of alteration or replacement even at matrix sizes. Sericite locally is not rare, and can penetrate the margin of the quartz on feldspar clasts, but this is rare. Tiny granules of opaques may be expyrite, in the matrix.
Authigenic Activity	-	See general comments

Sample 3503.5

Lithology		Lithic Feldspathic arenite
Sorting		Poor
Grainsize		Coarse to fine sand.
Grain Shape		Rounded (coarse) to sub angular
Constituents		(with estimated modal %)
Quartz 45-50%	-	Monocrystalline 1-2mm rounded, subordinate to 0.1 - 0.3mm angular quartz. Rare polycrystalline millimetric quartz. Influence of sample deformation by extraneous forces important.
K Feldspar 35-40%	-	Microcline perthite maximum 0.5mm, fresh, sub tabular larger dimension crystals to cleavage fragments for smaller material.
Plagioclase <1%	-	Rare
Micas <1%	-	Coarse material as inclusions or replacement of K feldspar, or quartz plus rare dark biotite partially wrapped around quartz clast, to 0.3mm length.
Opaques <1%	-	Rare partially oxidised sulphides (0.1mm) probably pyrite.
Heavy Minerals <1%	-	Negligible apart from trace of tourmaline.
Rock Fragments 3-5%	-	Several 0.5mm granite pieces, and 0.1 - 0.2mm acid / intermediate volcanics.
Detrital Matrix 5%	-	The gradation of quartz and feldspar to matrix size and its low volume obscures other cement / matrix material to normal optical examination. Part of the slide features an abundant zone, low in clastics, with fine calcite important. The SEM found barite in this 'silty' material showing it to be drilling mud, also distinguished by its dark colour and fine opaque content.
Authigenic Activity	-	See general comments

PHOTOGRAPHS AND DESCRIPTIONS

OF

EIGHT (8) SWC

PHILLIPS

SELENE No. 1

NOTE: Printing on reverse side of next 3 pages. Please scan both sides of page

Photo 1 2900m

Rare glauconite pellet in matric of fledspathic arenite. Nicols uncrossed Width of Field 0.7mm

Photo 2 2925m

Slightly rounded microcline set in fine sand sized clasts of angular quartz and subrhombic microcline in a matrix dominated by degenerate biotite. Nichols crossed Width of Field 1.8mm

Photo 3 2945m

Dominance of coarse subrounder quartz and subeuhedral microcline perthite in lithic feldspathic arenite. Nicols crossed Width of Field 1.8mm

PE906309

This is an enclosure indicator page.
The enclosure PE906309 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906309 has the following characteristics:

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CONTAINER_BARCODE	= PE902605
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BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= PHOTOMICROGRAPH
DESCRIPTION	= Colour microphotographs of thin sections from Selene-1, Photos 1-3.
REMARKS	=
DATE_CREATED	= 21/03/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

Photo 1
2900m

Photo 2
2925m

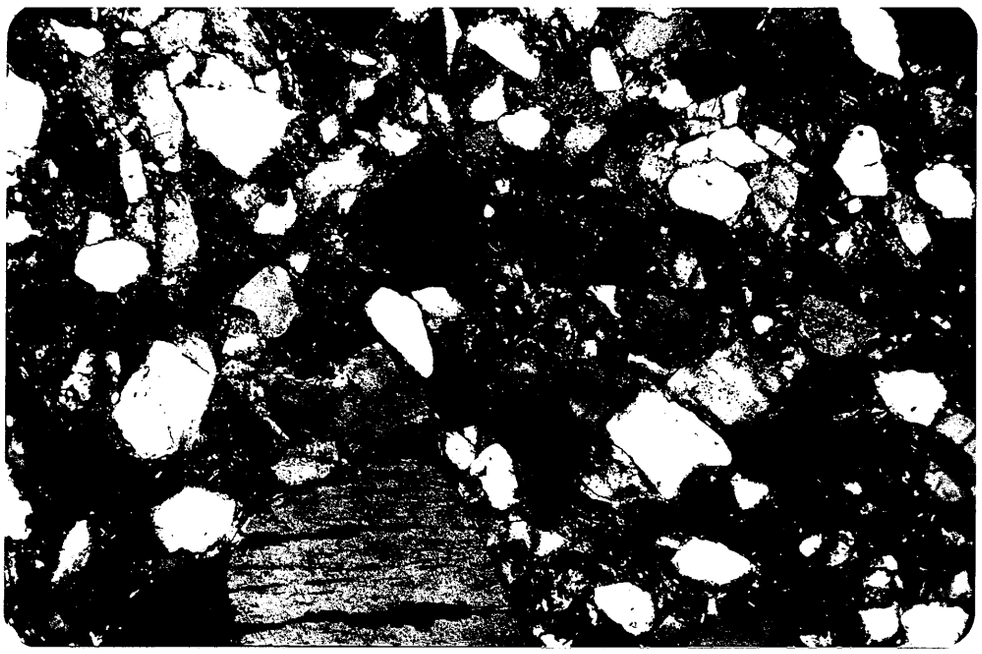

Photo 3
2945m

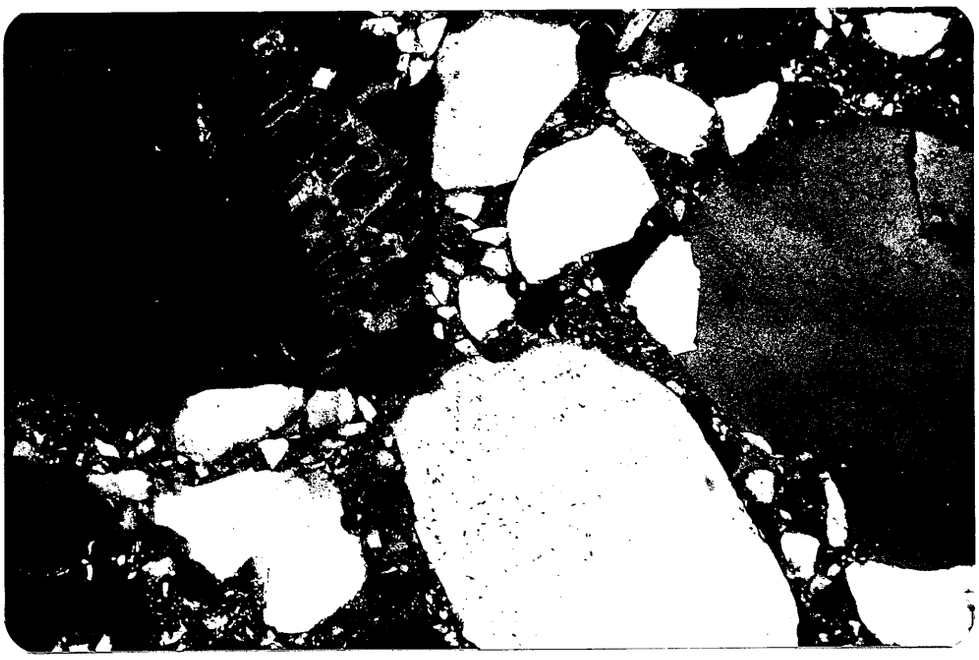

Photo 4 2980m Heterogeneous lithic feldspathic arenite, showing dolomite cemented in fine arenite, and coarse subeuhedral microcline perthite with subordinate clastic matrix. Nicols crossed Width of Field 1.8mm

Photo 5 3105m Lithic feldspathic arenite, showing quartz, slightly stained K feldspar, chert and large muscovite. Nicols crossed Width of Field 1.8mm

Photo 6 3345m Feldspathic arenite, showing dominance of angular quartz and K feldspar as clasts and the dominance of micas as cement, some are stained. Nicols crossed Width of Field 0.7mm

PE906310

This is an enclosure indicator page.
The enclosure PE906310 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906310 has the following characteristics:

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BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= PHOTOMICROGRAPH
DESCRIPTION	= Colour microphotographs of thin sections from Selene-1 Photos 4-6.
REMARKS	=
DATE_CREATED	= 21/03/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

Photo 4
2980m

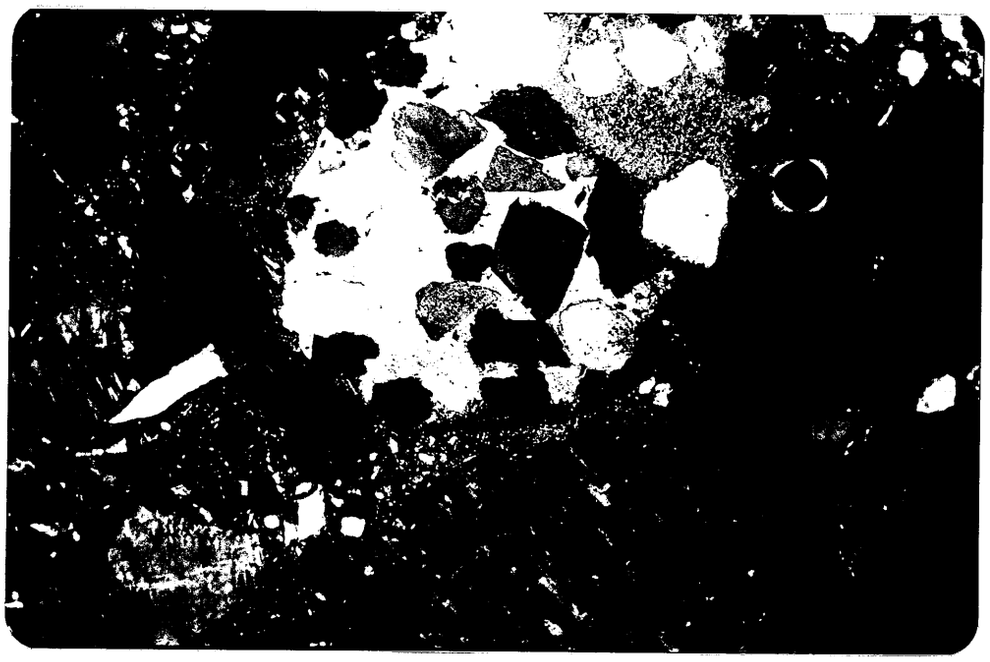

Photo 5
3105m

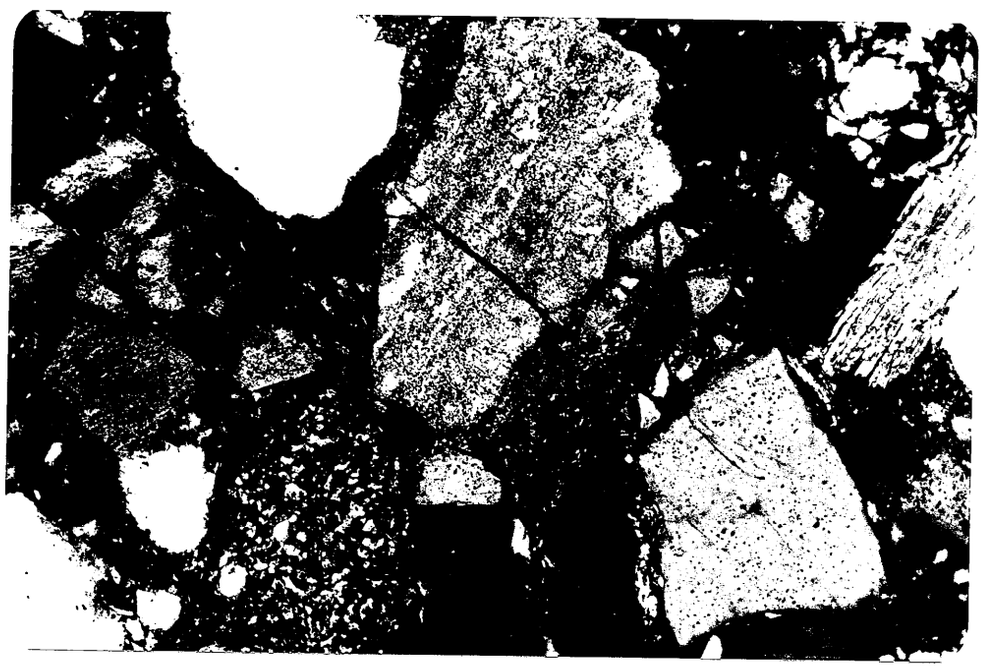

Photo 6
3345m

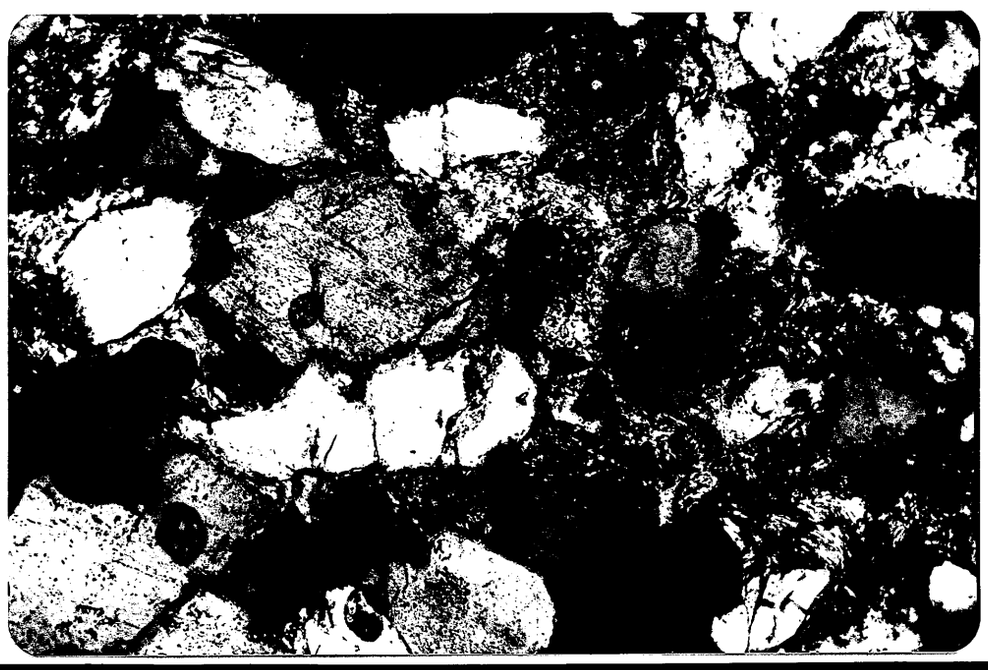

Photo 7 3461m Large rounded quartz and less rounded microcline in fractured feldspathic arenite. Fragmentation of smaller quartzes visible. Nicols crossed Width of Field 1.8mm

Photo 8 3503.5m Poorly sorted lithic feldspathic arenite featuring large slightly rounded quartz and fine sand of quartz and microcline perthite. Nicols crossed Width of Field 1.8mm

PE906311

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BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= PHOTOMICROGRAPH
DESCRIPTION	= Colour microphotographs of thin sections from Selene-1 Photos 7-8.
REMARKS	=
DATE_CREATED	= 21/03/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

Photo 7
3461m

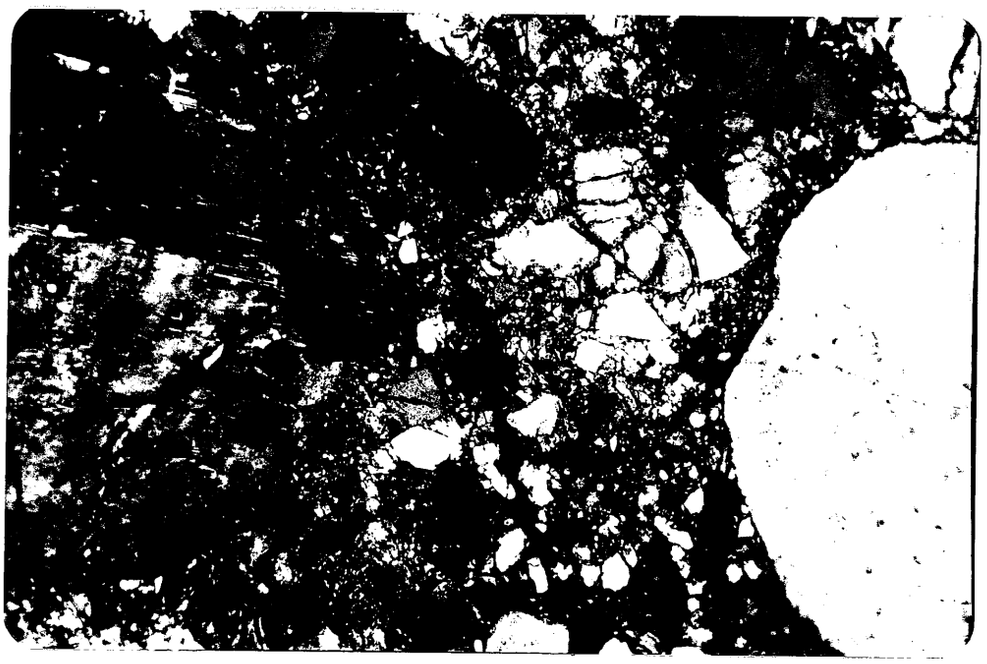
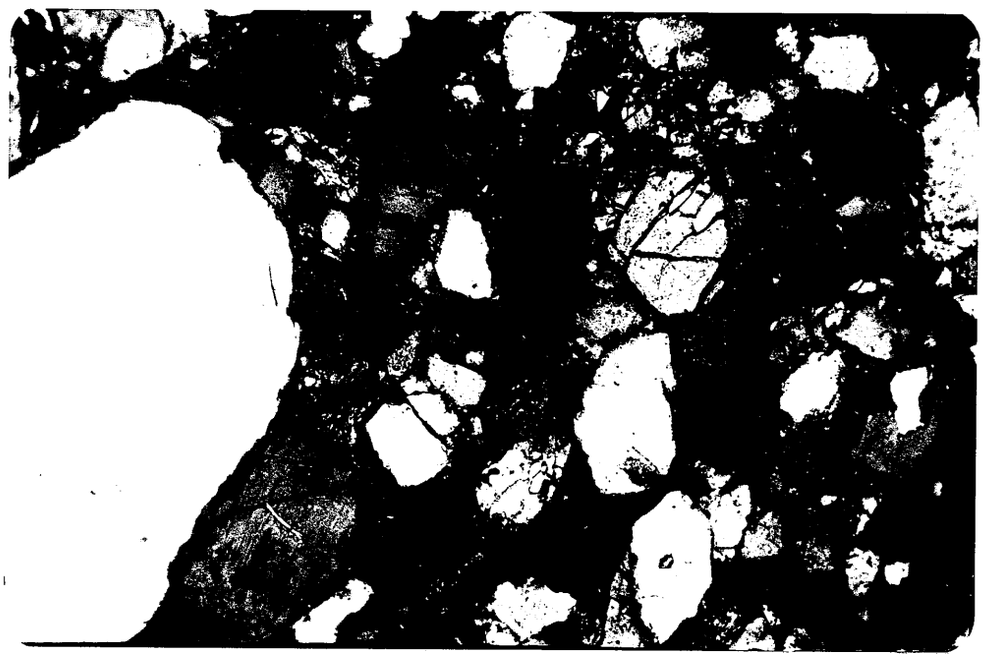


Photo 8
3503.5m



PE906312

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The enclosure PE906312 is enclosed within the container PE902605 at this location in this document.

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CONTAINER_BARCODE	= PE902605
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BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= PHOTOMICROGRAPH
DESCRIPTION	= SEM black and white microphotographs from Selene-1 Photos 1-3.
REMARKS	=
DATE_CREATED	= 21/03/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

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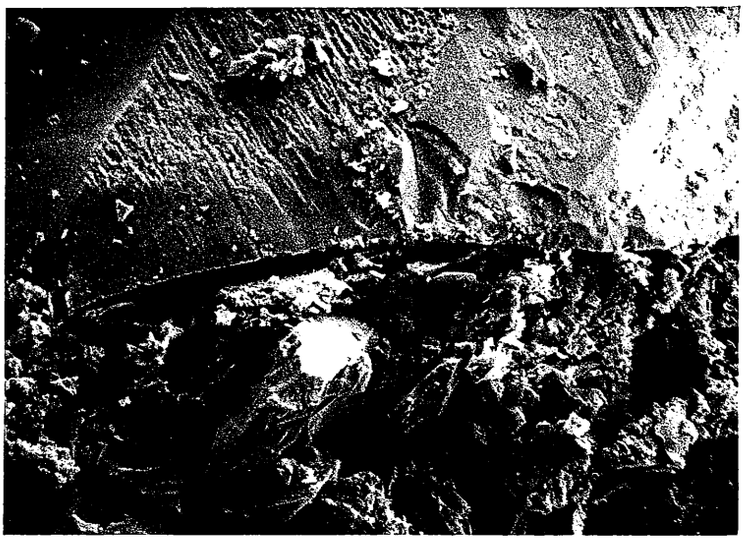
SEM Photo 1 2945m

Contact between coarse quartz clast and silt sized slastic Matrix featured quartz (conchoidal fracture), feldspar (cleavage fragments) and micas.

Width of field 500 microns.



SEM Photo 2 2945m

Surface of broken core chip showing several microcline crystals with face presentation in part? Supporting immaturity of sediment.

Width of field 2000 microns.

SEM Photo 3 2945m

Broken quartz macro clast with accentuated curved fracture development, possibly the result of explosive sampling method.

Width of field 1000 microns.

APPENDIX NO. 7

MICROPALEONTOLOGICAL REPORT

STRATIGRAPHY
of the
FORAMINIFERAL SEQUENCE
in
SELENE # 1,
GIPPSLAND BASIN.

for: PHILLIPS AUSTRALIAN OIL COMPANY.

March 3rd, 1983.

David Taylor,
23 Ballast Point Road, Birchgrove, 2041.
AUSTRALIA. *(02) 82 5643.*

SELENE # 1

STRATIGRAPHIC SUMMARY.

Sample Depth m	ZONE*	AGE†	¶STRAT UNIT & PALEOENVIRONMENT¶	E-LOG PICK
1270 to 1715	B-2 to C	LATE to MID MIOCENE	CANYON FILL MEMBER of GIPPSLAND LIMESTONE shelf edge at base (≈200m) filling to shallower depth (<200m) at top	1740 or 1810
1815 to 2232	poor assemblages ? D-1	MID MIOCENE	CANYON FILL MEMBER of GIPPSLAND LIMESTONE. Upper Slope situation (400-200m). High energy with slumping at base	2234
2234 to 2400	D-1 to D-2	MID MIOCENE	TASMAN SEA CARBONATES with deep water oozes. Anoxic between 2275 & 2234. Oxic between 2800 & 2300 where energy regime was higher with influxes of detrital quartz etc.	
2500 to 2800	F to H-1	EARLY MIOCENE		
(12 m.y.)				2807
2810 to 2820	J-2	EARLIEST OLIGOCENE	LAKE ENTRANCE MARL equivalent shelfal environment - high energy with detrital quartz etc. Paleodepth increasing upsection to 100-200m.	2821
2822	K	LATEST EOCENE	COLQUHOUN FORMATION Intertidal (<10m)	
(2 m.y.)				2822.5
2826 to 2838	N	late MID EOCENE	GURNARD FORMATION "Greensands" Intertidal near entrance of Estuarine system.	
(7 m.y.)				2839
2840 to 2842	O	early MID EOCENE	FLOUNDER FORMATION	
?	?	?	?	2842
2843 to 2852	low diversity assemblages	EARLY EOCENE on dinoflagellates	equivalents Barrier/Dune/ lagoonal system.	
2848 to 2852	no planktonics	EARLY EOCENE on dinoflagellates		
(≈17 m.y.)				?2870
2879.5 to 3151	? no planktonics	Latest CRETACEOUS on spore/ pollen (no dinoflagellates)	Swamp/Marsh ponds slightly saline at 3020 with arenaceous foraminiferal assemblage.	

† Summary of results of examination of fifty sidewall cores and one conventional core sample as listed on Tables 2 to 5.

* Based mainly on planktonic foraminifera with available palynological results. See palynology report by Helene Martin & David Taylor for final synthesis. Detailed planktonic foraminiferal distribution on Table 2 for Eocene to base Miocene; on Table 4 for Miocene. Table 1 gives reliability for planktonic foraminiferal zonal boundary picks.

¶ Interpretations based on distribuiton of planktonic, benthonic and plant microfossils as well as other sediment grains (>.075mm). On Table 3 for Eocene to base Miocene Table 5 for Miocene.

(12 m.y.) Hiatus with time span in parentheses

BIOSTRATIGRAPHY.

This discussion is based on the distribution of Tertiary planktonic foraminifera in the Gippsland sector of the Tasman Sea Provence. At the time of compilation of this report, palynological results were not complete, but note is made of preliminary results where applicable. The palynological compilation report by Helene Martin and David Taylor will contain synthesis of the planktonic foraminiferal and palyno-stratigraphy, with any necessary reconciliation.

LATE CRETACEOUS-? to 3181 to 2879.5m.

Age is based entirely on identification of the spore/pollen Zone of *Tricolpites longus* by Helene Martin. No planktonic foraminifera were found in four samples examined. However, the sidewall core at 3020m contained a late Cretaceous/Paleocene morphologically primitive arenaceous foraminiferal assemblage similar to those described from the Otway Basin by Taylor (1965).

EARLY EOCENE - 2870 to 2843m.

Age determination based on dinoflagellates (see Palynology Report), as there were only sporadic occurrences of low diversity assemblages of *Globigerina* spp which were ubiquitous in both early and mid Eocene times.

MID EOCENE ZONE O - 2842 to 2840m.

The association of *Globorotalia centralis, G. collactea, G. turgida* and *Globigerina frontosa* places the assemblage at 2842 in a biostratigraphic position equivalent to Zone Pll of Blow (1979); thus deposition took place in the early part of the Mid Eocene.

MID EOCENE ZONE N - 2838 to 2826.

At or near the top of the mid Eocene on range overlap of elements in these assemblages. In the Tasman region (refer Jenkins, 1974) *Globorotalia collactea, Globigerina primitiva* and *G. angiporoides* all became extinct at or near the top of the Mid Eocene; whilst *Globigerinatheka index* and *Globorotalia aculeata* first appear in mid Eocene and continued into the late Eocene. Middle Eocene dinoflagellates are recorded in this interval in Selene # 1.

A hiatus with an estimated time span of 7 million years was evident at 2839m (E-log) between Zone O and the overlying Zone N assemblages. The apparent abbreviation of the Zone O interval may have been due to erosion during the onslaught of the Zone N marine ingression.

LATE EOCENE ZONE K - 2822.

After a hiatus of some 2 million years, sediment was deposited at the top of the Eocene. This very high Eocene placement is evident by the presence of the keeled morphotype of *Globorotalia cerroazulensis cocoaensis* (refer Stainforth et al, 1975, p.258). The very thin development of Zone K (1.5m on E-log) was followed without a discernible break, by earliest Oligocene, Zone J-2 assemblage at 2820m.
The planktonic assemblage at 2822 was surprisingly diverse with warm water elements, such as *G. cerroazulensis cocoaensis*, whilst the early Oligocene faunas were composed entirely of species endemic to the Southern Ocean (Jenkins, 1974), with a total absence of tropical elements. This faunal change from cosmopolitan to parochial reflected the rapid paleotemperature deterioration in the Southern Ocean on the Eo/Oligocene boundary (Shackleton & Kennett, 1975 and Loutit & Kennett, 1981, p.60). All evidence presented indicates strongly that the sample at 2822 was deposited 37 million years ago, on the Eo/Oligocene boundary.

EARLY OLIGOCENE ZONE J-2 - 2820 to 2810m.

Assemblages contain elements typical of the Tasman Early Oligocene Zone of *Globigerina brevis* (Jenkins, 1974). The widespread Oligocene Hiatus of Gippsland (the *COBIA EVENT* of Taylor, 1983) and in the Tasman-Coral Sea region (Kennett et al, 1975 and Loutit & Kennett, 1981, p.57), was apparent at 2807 (E-log pick) with a time gap of some 12 million years.

MIOCENE - 2800 to 1270.

Sedimentation resumed in earliest Miocene times, as is evident by the presence of Zone H-1 assemblages between 2800 and 2765m. Above 2800, a continuous sequence of Miocene deep water and canyon carbonate sediments were present with the highest sample examined (at 1270m) representing the Late Miocene Zone B-2. A sampling gap of 100m between 2500m and 2400m occurred over the levels of occurrence of Zones E-2 & E-1. Usually those E Zone faunas occupy a very thin sediment interval in Gippsland deep water sequences. Moreover, the Zones E-2

& E-1 time span was very brief as species evolution was accelerated by oceanic warming.

Biostratigraphic control was poor to non-existant in the canyon carbonate fill sequence at and above 2232m. This is a common phenomenon in Gippsland wells, due to the high energy regime which sorts and concentrates mainly very small sized specimens, which, being juvenile are specifically indeterminate. Another factor, regarding species recognition, is the poor preservation, cuased by carbonate diagenesis of the fill. It is assumed that Zone D-1 occupied the thick interval from 2232m to at least 1815m in Selene # 1.

PALEOENVIRONMENT and ROCK STRATIGRAPHY.

Some of the remarks below, may be expanded or slightly amended in the final paleoenvironmental and rock stratigraphic conclusions are drawn in the paleontological synthesis section of the Selene # 1 palynology report.

? to 3181 to 2879m - Latest Cretaceous - Latrobe Delta Complex.

Predominantly non-marine, but with at least one marginal marine episode at 3020m; evidenced by an association of the arenaceous foraminifera *Haplophragmoides* spp. with pellet glauconite and biogenic pyrite. Such a benthonic fauna was euryhaline, withstanding fluctuation in salinity to as low as $4^{o}/_{oo}$ as well as anaerobic conditions (Taylor, 1965). Dinoflagellates were not recorded in this sample which was usually the case in sediment containing *Haplophragmoides* spp assemblages from the Late Cretaceous to early Tertiary of the Otway Basin.

2870 to 2840m - EARLY EOCENE to MID EOCENE - FLOUNDER FORMATION EQUIVALENTS.

In this interval, the dominant sediment grains (>.075mm) are frosted, pitted and/or impact fractured quartz grains, features probably cuased by eolian processes (Margolis & Krinsley, 1974). Limonitic clays are common and could have been from paleo-soil horizons. Within this interval, were indications of marine ingressions into marginal marine environments. Dinoflagellates occurred throughout, with sporadic planktonic and arenaceous benthonic foraminiferal associations in five out of the nine sidewall cores. Foraminiferal frequency increased upsection, reaching a peak at 2842m (refer Table 5). Distribution of glauconite and biogenic pyrite also demonstrates an up-sequence frequency increase. One sample, at 2845m, contained an

appreciable amount of crystalline carbonate, which was probably dolomite, though possibly siderite. The total of these observations is that sedimentation took place within a barrier/dune/estuarine regime analagous to that of the present day Gippsland Lakes - Ninety Mile Beach system (Taylor, 1983).

This interval is equated with the Flounder Formation having been deposited over the same time-span and within a marginal-marine regime. However, the sedimentary facies in Selene differs from that defined for the Flounder Formation. But the rock type is dependent on the exact position at any one time that sedimentation took place within such a barrier/dune/estuarine system. The typical siltstones and mudstones of the Flounder Formation were deposited in deep protected estuaries behind and to the lee of the dunes, whilst the Selene sequence was deposited on or just windward of the dunes. It should be noted that the lower part of the Formation in the type section contains an abundance of quartz with at least one coarse sandy lens (refer Flounder # 1 tabulation in Taylor, 1983, p.13).

2838 to 2826m - LATEST MID EOCENE - GURNARD FORMATION.

Sedimentation took place in a lagoonal situation in proximity to the entrance to the system from a shallow platform continental shelf. The basal sample at 2838m was the only one to contain quartz grains, sculptured by eolian processes. No doubt this was a surface of the underlying unit, reworked during the onslaught of the late Mid Eocene ingression. Apparent abbreviation has already been noted at the top of the Flounder Formation in Selene (refer p.2 this report).

Age, faunal characteristics and sediment types are all consistant with a designation of Gurnard Formation for this unit.

2822 to 2810m - LATE EOCENE to EARLY OLIGOCENE - COLQUHOUN FORMATION and LAKES ENTRANCE MARL EQUIVALENTS.

A sequence of fine quartz sandy marls were deposited at the very top of the Eocene and continue into early Oligocene times, before the effects of the *COBIA EVENT* resulted in all the mid to late Oligocene sediment being absent in this sequence. The encroachment of the late Eocene-early Oligocene transgression is demonstrated by changes in the benthonic foraminiferal assemblages and the high percentages of planktonic specimens in the total

foraminiferal faunas. Rapid increases in paleodepth are evident with a litteral situation in the latest Eocene progressively becoming an outer shelf one in the early Oligocene (refer Table 3).

On lithology alone it is not possible to differentiate between the Colquhoun Formation and the Lakes Entrance Marl equivalents. However there are marked E-log character changes at 2821m which correspond to the paleoenvironmental changes from the Late Eocene litteral fauna at 2822 to the Early Oligocene shelfal faunas from 2820 to 2810m. Therefore:-
The E-log interval 2822.5 to 2821m is considered to be the Colquhoun Formation:
whilst the E-log interval 2821m to 2807m is Lakes Entrance Marl equivalent.

2800 to 2234 - MIOCENE - TASMAN SEA CARBONATES and OOZES.

A thick sequence of biogenic carbonates with fluctuating proportions of quartz grains and non carbonate silts and clays. There is no meaningful pattern to variations in the degree of carbonate diagenesis (refer Table 5).

The entire unit was deposited on the upper part of the continental shelf in estimated water depth between 200 and 400m. So there was a marked environmental disruption associated with the *Cobia Event*, as the early Oligocene deposition was on the continental shelf.

A change in available oxygen to the depositional surface is noted between 2275 and 2245m; conditions at and below 2275 were oxic, whilst those above 2275 were distinctly anoxic. The anoxic conditions are evident from the sudden appearance of 30% biogenic pyrite in the sediment grain spread. Bioturbation, with faecal pellets and worm tubes accompanied this incoming of pyrite. Benthonic foraminiferal assemblages also reflect a physico-chemical change; especially with the presence of a calcareous spiculitic shelled form referable to the unusual genus *Carterina*. A similar change from aerobic to anaerobic deposition was documented in Helios # 1, where it occurred in Zone F, earlier than the Zone D-1 occurrence in Selene # 1.

2232 to 1270m - MIOCENE CANYON FILL MEMBER of the GIPPSLAND LIMESTONE.

The base of the canyon fill sequence is recognised at 2232 by the deterioration in frequency and diversity of foraminifera. The very high proportion of small sized specimens of planktonics resulted in the loss of biostratigraphic control from 2232 and 1815m (refer p.4). Progressive progradation and infilling of the canyon is interpreted from microfossil distribution. The change from an upper slope to shelf edge situation was marked by the influx of siliceous sponge spicules at 1715m and a general improvement in the variety and preservation of the foraminifera; biostratigraphic control was re-assumed at this level.

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TABLE 1

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 23m GL: -268m

WELL NAME: SELENE # 1 TOTAL DEPTH:

AGE		FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
			Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
		B_1										
MIOCENE	LATE	B_2	1270	1				1415	1			
		C	1515	1				1715	1			
	MIDDLE	D_1	2215	2	2234†	0		2240†	1			
		D_2	2245	0				2400	0			
		E_1	* *					* *				
		E_2	* *					* *				
	EARLY	F	2500	0				2500	0			
		G	2635	1				2745	1			
		H_1	2765	1				2800	1			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2	2810	0				2820	0			
EOCENE		K	2822	0				2822	0			
		Pre-K	2826	1				2842	1			

COMMENTS: †The very thin representation of D-1, due to adverse environmental factors operating in Miocene canyon at & above 2232. Actual top D-1 may be as high as 1740m E-log.

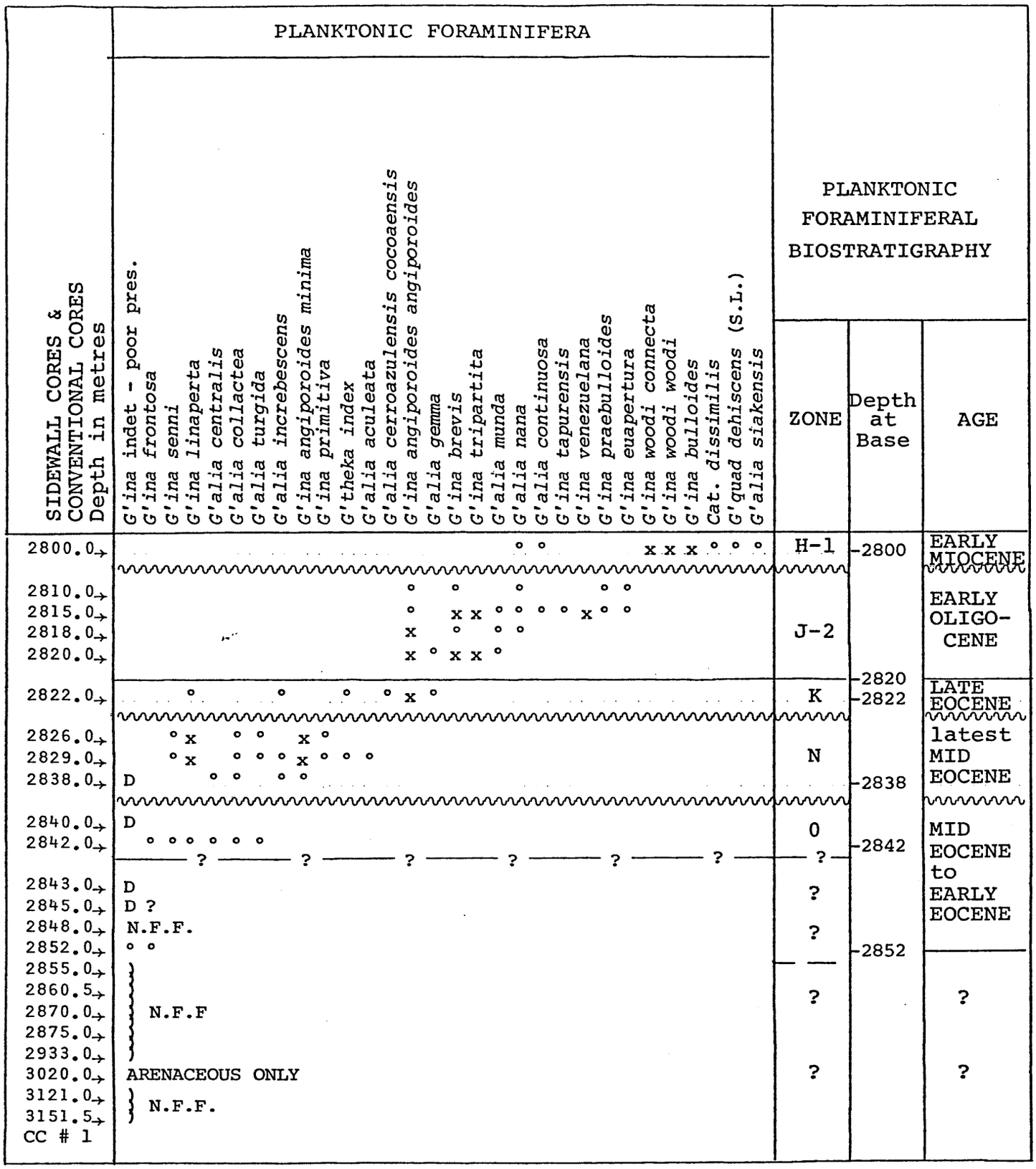
**Sampling gap of 100m, probably responsible for non-recognition of Zones E-1 & E-2.

¶ Zone N (late Mid Eocene) between 2826(1) & 2838(1) Zone O(Early Mid Eocene) at 2842(1). Low diversity Early to Mid Eocene planktonic assemblage between 2843 & 2852.

CONFIDENCE RATING:

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

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

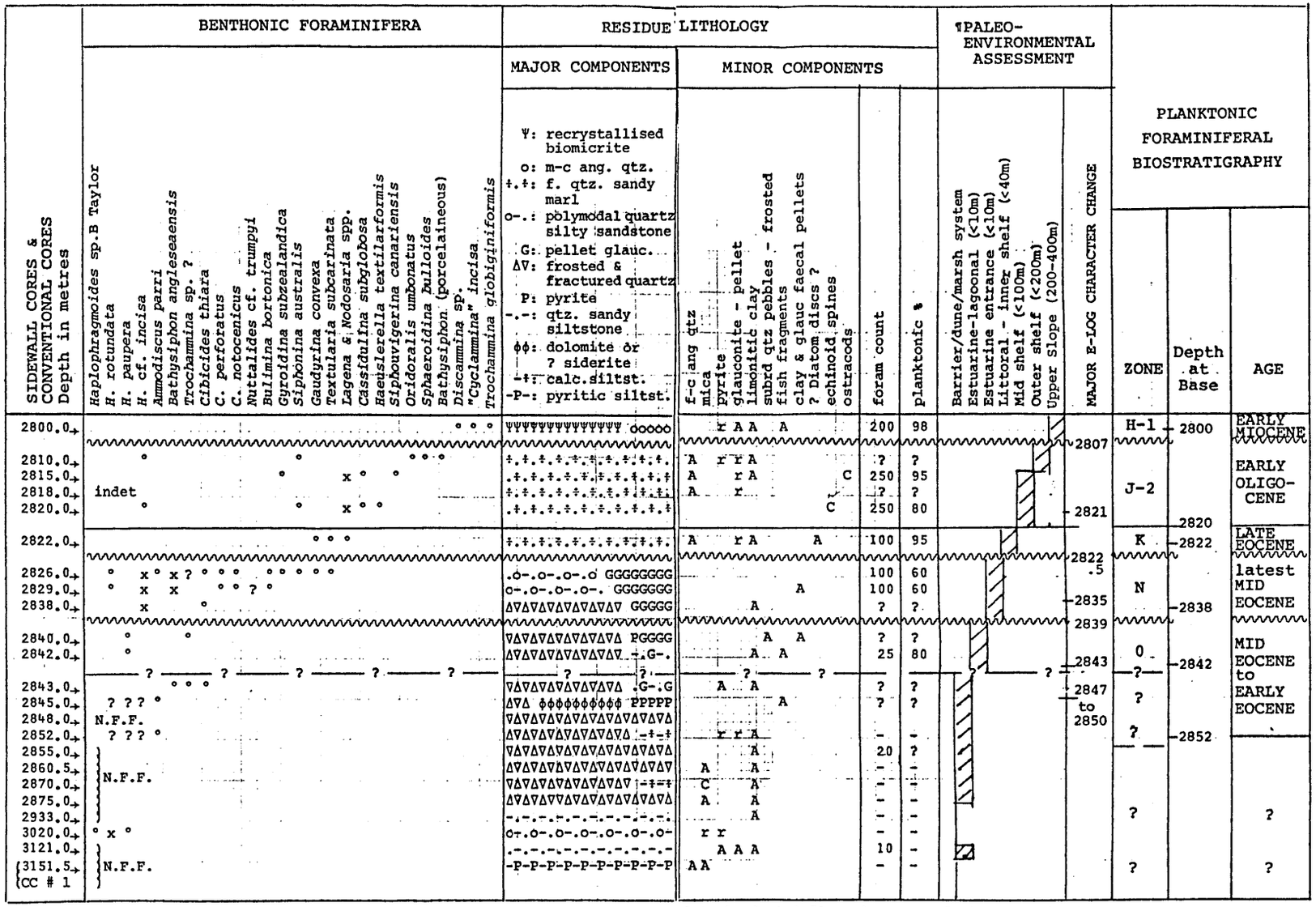


KEY: ° = <20 specimens
x = >20 specimens
D = Dominant >60% specimens
? = determination queried
N.F.F. = no foraminifera found
~~~ = definite hiatus
—?—? = hiatus - uncertain

TABLE 2: EOCENE to EARLY MIOCENE PLANKTONIC FORAMINIFERAL DISTRIBUTION - SELENE # 1.

refer Table 4 for Miocene Distribution above 2800.0m.

David Taylor, 18/2/83.
~~~



KEY: ° = <20 specimens
x = >20 specimens
D = Dominant >60% specimens
? = determination queried
N.F.F. = no foraminifera found
≈≈≈ = definite hiatus
—?—? = hiatus - uncertain

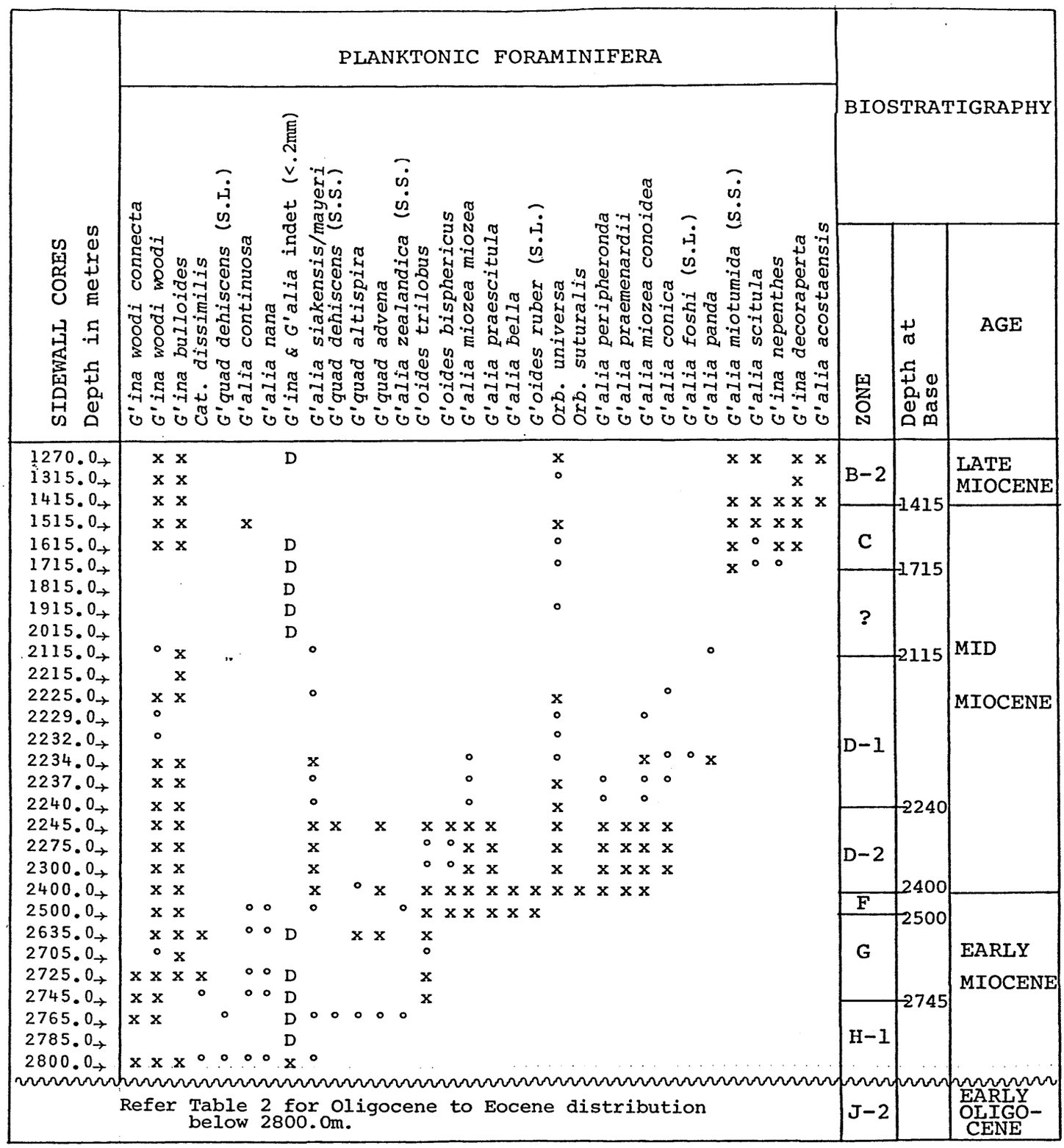
A = abundant 1-5% grains
C = common >20 grains
r = rare <20 grains

¶Paleowater depth in parentheses

TABLE 3: PALEOENVIRONMENTS - EOCENE to EARLY MIOCENE - SELENE # 1

Refer Table 5 for Miocene Paleoenvironments (2800-1270m)

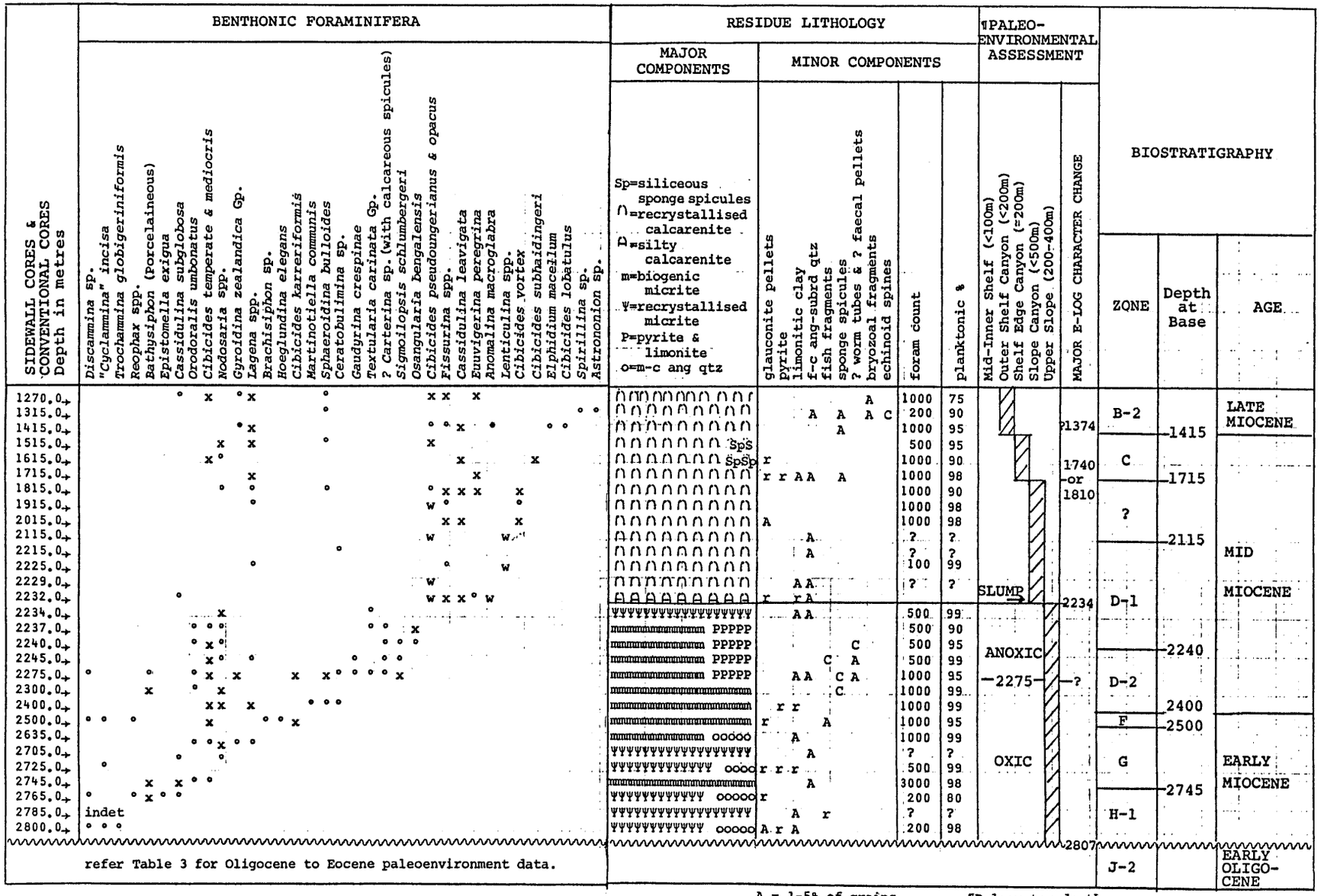
David Taylor, 22/2/1983.



KEY: ° = <20 specimens
x = >20 specimens
D = Dominant >60% specimens
definite hiatus

TABLE 4: MIOCENE PLANKTONIC FORAMINIFERAL DISTRIBUTION - SELENE # 1.

David Taylor, 25/2/1983.



refer Table 3 for Oligocene to Eocene paleoenvironment data.

KEY: ° = <20 specimens
x = >20 specimens
w = worn shallow water - displaced specimens.

A = 1-5% of grains
C = >20 grains
r = <20 grains

¶Paleowater depth in parentheses.

TABLE 5: MIOCENE PALEOENVIRONMENT - SELENE # 1.

APPENDIX NO. 8

PALYNOLOGICAL REPORT

THE STRATIGRAPHIC PALYNOLOGY
of
SELENE # 1,
GIPPSLAND BASIN.

for: PHILLIPS AUSTRALIAN OIL COMPANY,

April 12, 1983.

Helene A. Martin,
School of Botany,
University of New South Wales,
Box 1, P.O.,
Kensington, 2031,
AUSTRALIA (02)662-2954.

SELENE # 1

STRATIGRAPHIC PALYNOLOGY SUMMARY.

Depth (m)	Zone	Age	Paleoenvironment
1822	—	Late Eocene or younger	Marine
2826 to ¶2875A	—	Early to Mid Eocene*	Marine
¶2875B	*?T.longus/L.balmei* Transition		Non marine
2879.5 to 3181	*T. longus*	Maastrichtian	Non marine
3195.5 to 3523	*T. lilliei*	Campanian	Non marine

* Refer Reconciliation at back of report.

¶ Two sidewall cores were shot in seperate "runs" at depths similarly labelled as 2875. The sample 2875A (first "run") contains an assemblage distinctly different from that of 2875B (third "run" of sidewall cores).

The samples have been divided into three groups:

1) 3523m to 2875Bm - sidewall core of grey silts and clay with a considerable carbonaceous content.
2) 2875Am to 1822m - sidewall core of sands with very little carbonaceous material.
3) 2875Cm to 2835m - cuttings of grey silty clay chips. Some sand grains are present, but they probably result from down working of the sands listed above.

1. 3523-2875Bm - LATE CRETACEOUS.

The spores and pollen identified are listed in Table 1 and the ranges of diagnostic species are shown on Figure 1.

The species in Table 1 are grouped into three categories:-

1) Spores, mostly from ferns and their allies.
2) Gymnosperm pollen: pines e.g. hoop pine, Huon pine etc. These would have been mostly forest trees. Their relatives are found today in forests of Tasmania, New Zealand, New Caledonia and New Guinea. Only a few grow on the Australian Mainland and they are restricted to rainforests and the wetter climates.
3) Angiosperm pollen: flowering plants. These may have been trees or shrubs.

The ranges of diagnostic species and zonation follows Stover & Partridge (1973) as ammended by Partridge (1976). Experience has shown that subsequent publications on the same period extend the ranges of some diagnostic species. This is seen especially for the Early and Middle Cretaceous where three groups of authors have published on this time range. For this reason, if the ranges of some species fall slightly outside of those given in the references, then it is not considered serious. Sometimes there is conflicting evidence, and the method adopted then is to add up all the pros and cons before making a decision. THANK YOU

T. lilliei Zone - Campanian : 3523 to 3195.5m.

Species which first appear at the base of the *T. lilliei* Zone are present in the deepest sample. These diagnostic species are *Gephyrapollenites wahooensis, Nothofagidites endurus, Tricolporites lilliei* and *Triporopollenites sectilis* (see Table 1 and Figure 1). There is variation in presence and abundance of some species but no trends, i.e. the overall aspects of the assemblages remain much the same up to 3195.5m.

Wood, cuticles and other plant tissue fragments occur throughout in variable quantities. Abundant plant tissue fragments is thought to indicate a swamp environment. Where wood is conspicuous, the gymnosperm pollen is usually more abundant, particularly *Phyllocladidites mawsonii* (living relative, Huon Pine) and this could indicate a swamp-forest environment.

T. longus Zone - Maastrichtian, 3181 to 2875Bm.

The overall characteristics of the assemblages here are much the same as those for the *T. lilliei* Zone. The top of the older zone is marked by the introduction of some five diagnostic species which mark the base of the younger zone. Three of these five species have been seen, and two of these only once, leaving only one, viz *Tetracolporites verrucosus* which has been recorded regularly, although not in every assemblage. Stover & Partridge show *Australopollis obscurus* appearing about half way through the zone, but it has been found together with *T. verrucosus* at the base of this zone. Thus the top of the *T. lilliei* Zone is defined on negative evidence and only slight evidence for the delimitation of the base of the *T. longus* Zone has been found here.

Wood, cuticles and other plant tissue fragments occur throughout, just the same as the *T. lilliei* Zone.

The sample from 2875B stands apart from all the others. It is by far the best preserved, with the most abundant pollen and the richest assemblage. Some Tertiary forms are present (see Figure 1), but the *T. longus* species are by far the most abundant. However, this assemblage could be transitional towards the *L. balmei* Zone.

Palaeoecology.

No dinoflagellates have been found anywhere here, indicating non-marine conditions. There is an overall similarity of the assemblages which probably result from relative stability of the environment. The exceptional preservation and abundance in the assemblage at 2875Bm may indicate the start of some change.

2. 2875A - 1822m - EOCENE.

The dinoflagellates, spores and pollen found in these samples are listed in Table 2. The ranges of relevant diagnostic species are shown on Figure 2.

Spores and pollen are sparse and the species found are mostly thick walled or tough and likely to survive transport and degredation. Frequently, only one or two specimens of each species have been found and they are usually corroded or crumpled. There is virtually no plant tissue debris in any of the samples, indicating that this area of deposition was not receiving plant debris from the land. Thus the spore-pollen assemblages are exceedingly poor and of hardly any value for an age determination. *Spinozonocolpites prominatus* is the exception; and it is usually well preserved. The parent plant of this pollen species is *Nypa*, the mangrove palm, hence transportation to the site of deposition was via a different route to that of pollen from land-based plants. Its range is included on Figure 2.

The dinoflagellates in these sandy samples are few and mostly crumpled or broken. They are also quite small. This probably results from the high energy nature of the area of deposition. *Spiniferites ramosus* is by far the most common. Several subspecies have been seen but they are of no stratigraphic value so they are not identified here.

There are very few diagnostic species present; *Glaphycrocysta retiintexta* is not recorded as having ranged above the Early Eocene. However, an early Eocene age for samples between 2838m and 2826m conflicts with the Mid Eocene aspect of the planktonic foraminiferal fauna (refer "*Reconciliation*" at back of this report).

The sample at 1822m was no older than Late Eocene age, as it contained *Systematophora placacantha*, which ranged from the Late Eocene to at least the Miocene. The planktonic foraminiferal assemblage was definitely Late Eocene as it included *Globorotalia cerroazulensis cocoaensis* with *G. gemma* and *Globigerinatheka index*.

Palaeoecology.

A marine environment not conducive to the accumulation of dinoflagellates or plant debris, spores and pollen from the land.

3. 2875C - 2835m.

These samples were ditch cuttings, hence presence of contamination by down working is likely. However, there are no spore-pollen assemblages above 2835m, and only the dinoflagellates in the sand, so the source of possible contamination is very limited.

The assemblages consist of dinoflagellates, spores and pollen and are generally much the same as those in the sandy samples. However, preservation is better and there is more diversity and abundance and most of the dinoflagellates are larger (i.e. normal sized) when compared to those in the sandy samples. All of this is consistent with the silty clay nature of the samples.

The spore-pollen assemblages are very restricted and there is virtually no plant debris present. As with the sandy samples, they are of practically no value for age determinations, except for *Spinozonocolpites prominatus*.

Five of the diagnostic species of dinoflagellates and *S. prominatus* are present in these samples (see Table 2 and Figure 2), indicating an Early to Mid Eocene age. The spores and pollen found here are consistent with this age.

Palaeoecology.

These ditch cutting samples provide evidence of a marine environment apparently more conducive to the accumulation of dinoflagellates, spores and pollen than the same interval represented by sidewall core. This difference was due to the sidewall cores being mainly of sand grade, thus atypical of the aggregate lithology of the interval which contained a high percentage of silt and finer grade material. The palymorph accumulation was thus a function of energy; settling being greater in low energy, fine sedimentation episodes than during high energy, sand deposition. However, the depositional site was not receiving much debris spores or pollen from land based plants.

CONCLUSIONS and RECONCILIATION with FORAMINIFERAL DISTRIBUTION.†

Absence of dinoflagellates in the Late Cretaceous sediment below 2875m indicate this interval was deposited in non-marine conditions. But indication of slight marine influence was noted by the presence of an arenaceous foraminiferal fauna at 3020m.† The highest Cretaceous flora in the sidewall core at 2875Bm was a transitional one between the Late Cretaceous *T. longus* Zone and the Paleocene *L. balmei* Zone. Thus a latest Maastrichtian age is deduced for the surface upon which rest the marine to marginal marine sediments of early to mid Eocene age (e.g. sidewall core 2875Am).

The dinoflagellate zones tabulated on Figure 2 have been named but not documented in Partridge (1976). From the general discussion it would appear that these zones contain reasonable spore-pollen assemblages as well as dinoflagellates. Examination of two samples from Helios # 1 which contain the *I. druggii* and *E. crassitabulata* Zones confirms this impression. These zonal nominate species are the most common dinoflagellates in their respective samples. On this interpretation of the character of a Gippsland Basin dinoflagellate zone, these Selene assemblages do not fit any of the designated zones. *Apectodinium homomorphum* has been found in two samples, but only one or two specimens occur in each. As the range of this species extends well above the confines of the *A. homomorphum* Zone, it is unlikely that those assemblages represent this Zone; especially in view of the fact that the dinoflagellates at 2826m were associated with mid Eocene planktonic foraminifera.†

Conflict exists between the age assigned to a dinoflagellate assemblage and that of a planktonic foraminifera associated in the same sidewall core. For instance, from Stover et al (1979) the Dinoflagellate assemblages in sidewall cores from 2842 to 2826m would fall within the lower Eocene, yet the planktonic foraminifera are considered as Mid Eocene.† The ages of the Dinoflagellate Zones are based on examination of New Zealand Standard sections (refer Stover et al). However, the top of the range of *Rhombodinium ornatum*, together with the complete ranges of *Kisselovia thompsonae* and *K. edwardsii* would now be considered as Mid Eocene, being

†refer to *Stratigraphy of the Foraminiferal Sequence in Selene # 1, Gippsland Basin,* by David Taylor dated March 3, 1983.

associated with the planktonic foraminifera *Globigerina frontosa* (=*G. boweri* of Jenkins).† For these reasons, a "grey" area (marked by ? ?) appears on Table 2 between the Lower and Mid Eocene. Similar "grey" areas are apparent between the Paleocene and Eocene as well as between the Mid and Late Eocene. Resolution of these "grey" areas of conflict between dinoflagellate and foraminiferal workers can only be resolved upon availability of thorough documentation of both dinoflagellate and planktonic foraminiferal species distribution in the Gippsland Basin.

†refer to *Stratigraphy of the Foraminiferal Sequence in Selene # 1, Gippsland Basin,* by David Taylor dated March 3, 1983.

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APPENDIX NO. 9

REPEAT FORMATION TESTER ANALYSIS

APPENDIX NO. 9

SELENE NO. 1

ANALYSIS OF RESULTS OF REPEAT FORMATION TESTER

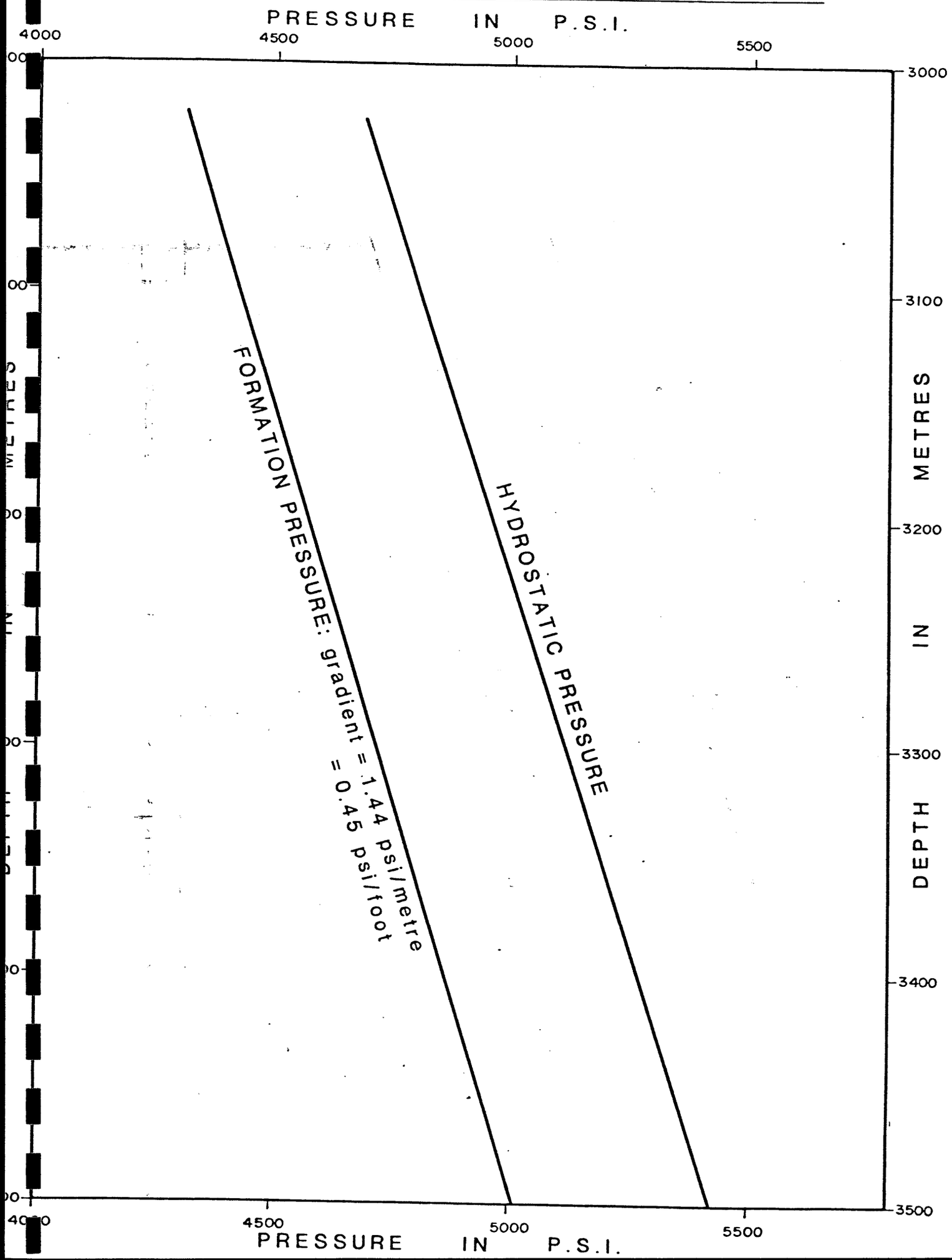
The formation pressure gradient is approximately 1.44 p.s.i. per metre = 0.45 p.s.i. per foot throughout the section 3023 to 3502 metres. This indicates the reservoir fluid is formation water of density 1.04 gms/c.c.

A segregated fluid sample was taken at 3144 metres (10,135 feet). The first sample chamber recovered 9500 c.c. of mud filtrate and formation water with a slight scum of hydrocarbon, which was probably contamination. The second chamber recovered mostly formation water with resistivity measured at 0.23 at 68°F. This is a salinity of approximately 31,000 NaC_1 equivalent. This is close to estimated values of formation water resistivity.

REPEAT FORMATION TESTER RESULTS FOR SELENE 1: 3023 - 3502 METRES

POINT	DEPTH METRES	DEPTH FEET	PERMEABILITY	FORMATION	
				HYDROSTATIC	PRESSURE
A	3023	9918	VERY HIGH	4693 PSI	4308 PSI
B	3034	9954	EXTREMELY HIGH	4711 PSI	4325 PSI
C	3062	10045	EXTREMELY HIGH	4754 PSI	4368 PSI
CD	3088.5	10133	EXTREMELY HIGH	4796 PSI	4408 PSI
D	3105	10187	EXTREMELY HIGH	4821 PSI	4434 PSI
E	3109	10200	EXTREMELY HIGH	4826 PSI	4438 PSI
F	3115	10220	POOR/MODERATE	4835 PSI	4454 PSI
G	3128	10262	EXTREMELY HIGH	4856 PSI	4467 PSI
H	3139	10298	VERY HIGH	4873 PSI	4485 PSI
I	3144	10315	EXTREMELY HIGH	4880 PSI	4490 PSI
J	3148	10328	EXTREMELY HIGH	4886 PSI	4495 PSI
K	3160	10367	EXTREMELY HIGH	4904 PSI	4512 PSI
L	3191	10469	EXTREMELY HIGH	4955 PSI	4564 PSI
M	3221	10567	VERY HIGH	5001 PSI	4610 PSI
MN	3303	10836	EXTREMELY HIGH	5117 PSI	4735 PSI
N	3414	11200	VERY HIGH	5291 PSI	4890 PSI
O	3446	11306	EXTREMELY HIGH	5340 PSI	4935 PSI
P	3462	11358	EXTREMELY HIGH	5361 PSI	4956 PSI
Q	3478	11411	EXTREMELY HIGH	5387 PSI	4979 PSI
R	3502	11489	EXTREMELY HIGH	5424 PSI	5013 PSI

SELENE 1 WELL,
AUSTRALIA : REPEAT FORMATION TESTER RESULTS



APPENDIX NO. 10

PETROLEUM GEOCHEMISTRY EVALUATION

HYDROCARBON SOURCE ROCK EVALUATION STUDY

PHILLIPS

SELENA No. 1

SUMMARY

Organic geochemical analyses carried out on sixty four (64) well cuttings and sidewall core samples from the Phillips Selena No. 1 Well have indicated the following:-

- The rocks penetrated by this well are thermally immature with little indigenous hydrocarbon generating potential
- The rocks from 2840m to 3080m have an immature, poor hydrocarbon source character.
- The rocks from 3080m to 3450m have an immature, potential good to very good hydrocarbon generating source character at a high level of thermal maturity.
- The rocks from 3240m to 3430m appear to represent a very oil-prone organic facies.
- The water samples recovered from 3144m contain very little hydrocarbon, and do not constitute a hydrocarbon show.

Paul Tybor

PAUL TYBOR

INTRODUCTION

Organic geochemical analyses have been performed on (64) well cuttings and side wall core samples along with two water samples from the Phillips Selena No. 1 Well.

The purpose of this report has been to evaluate the hydrocarbon source rock characteristics of the sediments penetrated by this well.

Analytical

Upon arrival at Analabs the following analytical program was carried out on these samples

Type of Analysis	Table	Figure
Rocks		
% Total organic carbon determination	I	1, 2
Pyrolysis analysis	I	1
C_1 - C_7 light hydrocarbon gas chromatography	II	2
Water		
Water analysis	III A,B	
C_1 - C_7 light hydrocarbon gas chromatography	IV	
Liquid chromatography	IV	
C_{12}^+ saturate gas chromatography		3, 4

A description of the various analyses performed in this study is presented in Appendix I, located at the back of this report.

General Information

Copies of this report have been mailed to Mr. Gale Yarrow of Phillips Australian Oil Co., located in Perth Western Australia.

Any questions related to this study maybe directed to Mr. Paul Tybor or Dr. Garry Woodhouse of Analabs, Perth W.A.

All data and interpretations contained within this study is proprietary to the Phillips Australian Oil Co., and is treated as highly confidential matter by all Analabs personnel.

RESULTS AND INTERPRETATIONS

A. Thermal Maturity of Sediments

The rocks penetrated by this well have experienced a very low geothermal history, and consequently they are interpreted to be within the pre-oil generating zone. This interpretation is based on the following geochemical observations:-

1) The low Tmax (C°) values (less than 425°C, Figure 1; Table I) recorded for the samples analyzed indicate thermal immaturity.

2) The low production index values (P.I.; Figure 1; Table I) calculated for these samples indicate thermal immaturity.

3) In the samples below 3270m, where significant C_1 - C_7 values were analyzed, the % Gas wetness drops, which is indicative of an immature sedimentary sequence (Figure 2; Table II).

As a result of this low thermal maturation, these sediments are only prospective for indigenously generated immature hydrocarbon (biogenic methane).

B. Hydrocarbon Source Characterization

Interval 2840m to 3080m

The sediments comprising well interval 2840m to 3080m were analyzed to contain lean amounts of light hydrocarbon (Figure 2, Table II) with samples between 3030m to 3080m containing poor to fair amounts of organic matter (% TOC; Figure 1; Table I). In light of the low thermal maturities of these rocks, we interpret this interval to have a poor hydrocarbon source character.

Interval 3080m to 3450m

The rocks within well interval 3080m to 3450m were analyzed to contain moderate to excellent amounts of organic matter (% TOC; Figure 1, Table I), which have an excellent hydrocarbon generating potential (S_2; Figure 1; Table I) at a higher level of thermal maturity. However, due to the thermally immature nature of these sediments, very little hydrocarbon (S_1; Figure 1; Table I) has been generated from the oil prone organic matter (high hydrogen index values, Figure 1; Table I) contained in these rocks.

Within this organic rich sequence is a zone, which appears to be some what different to the adjacent sediments, and extremely organic-rich. This zone is located between 3240m to 3430m.

The very organic rich nature of this zone is evidenced by the very good amounts of organic carbon analyzed (% - TOC; Figure 1; Table I). This zone also have correspondingly high C_1-C_4 light hydrocarbon contents (Figure 2; Table II), and hydrocarbon generating potential (S_2; Figure 1; Table I). Low amounts of C_5 - C_7 hydrocarbon were recorded, but this is due to the thermally immature nature of these rocks. These sediments are different from the adjacent rocks, due to the following:-

1) The hydrogen index values are overall higher for these rocks than for adjacent sediments.

2) The iC_4/nC_4 ratios are higher for the sediments in this zone than the adjacent sediments, and suggests that these rocks represent a different organic facies.

C. Exploration Significance

The sedimentary sequence penetrated by this well is essentially nonprospective for any indigenously generated hydrocarbon. This is due to the low geothermal maturation history of the rocks. At a more mature position within the basin, the adjacent time stratigraphic equivalents to sediments between 3080m to 3450m in this well, would be expected to have generated and expelled large amounts of hydrocarbons into available reservoirs. The time stratigraphic equivalents to the sediments analyzed within well interval 3240m to 3430m should be regionally evaluated for their hydrocarbon source potential.

D. Water Analysis

The data obtained from the analyses performed on the two (2) water samples collected at 3144m indicates that very little light hydrocarbon (C_1-C_7 Table IV) or heavy hydrocarbon (C_{12}+ Table IV) is contained in these waters. Consequently these formation waters do not appear to contain enough hydrocarbon to be considered to be shows.

PE906313

This is an enclosure indicator page.
The enclosure PE906313 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906313 has the following characteristics:

ITEM_BARCODE	= PE906313
CONTAINER_BARCODE	= PE902605
NAME	= Hydrocarbon Evaluation Log
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Hydrocarbon Source Rock Evaluation Log - General, for Selene-1
REMARKS	=
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

PE906314

This is an enclosure indicator page.
The enclosure PE906314 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906314 has the following characteristics:

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CONTAINER_BARCODE	= PE902605
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BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Hydrocarbon Source Rock Evaluation Log - C1-C7 Light Hydrocarbons, for Selene-1
REMARKS	=
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	= ANALABS
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

FIGURE 3

SELENE #1 3144m RFT SAMPLE

1.0 gal SEGREGATED SAMPLE

WHOLE EXTRACT

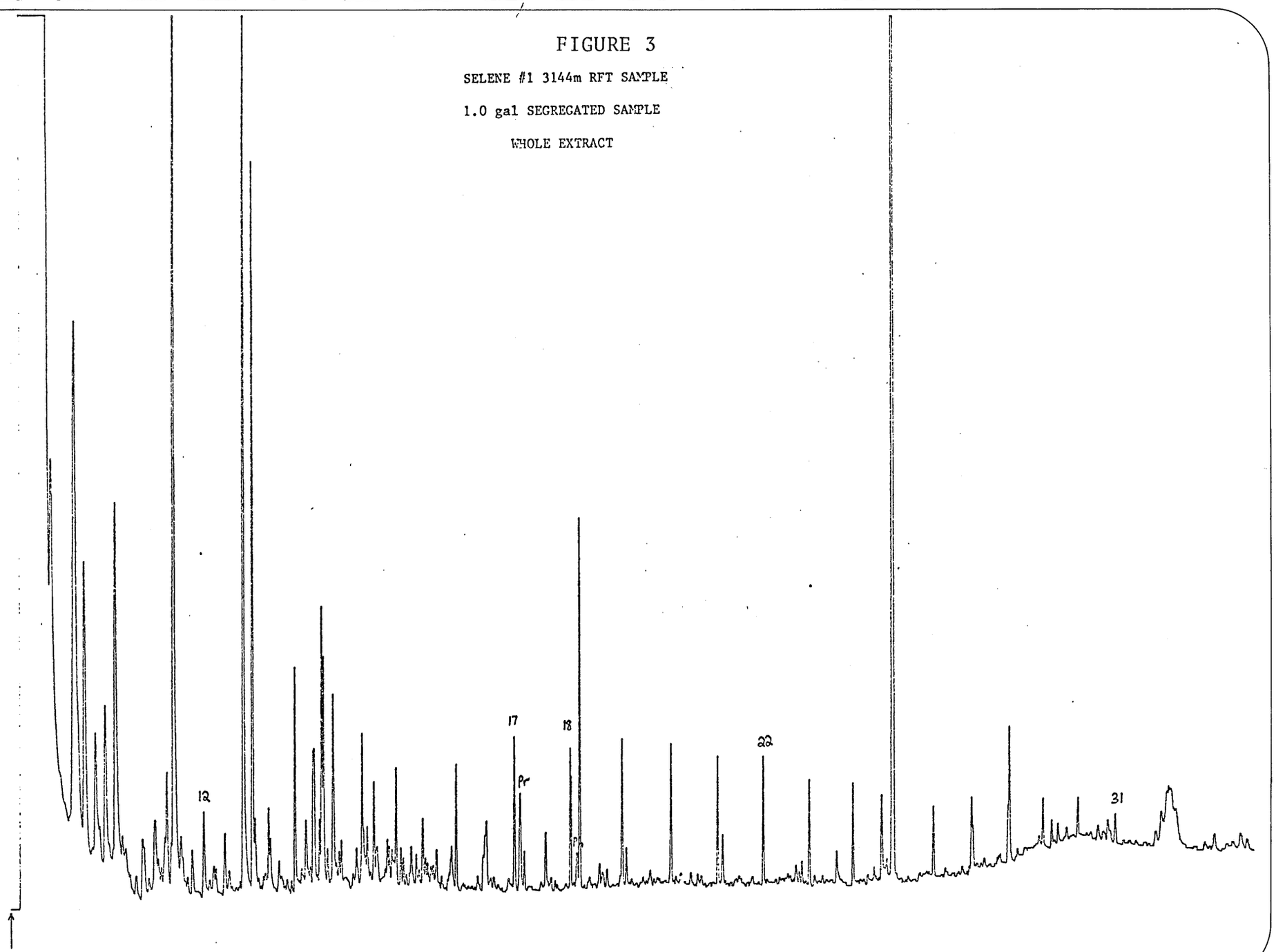

FIGURE 4

SELENE #1 3144m RFT SAMPLE

2.5 gal INITIAL CHAMBER

WHOLE EXTRACT

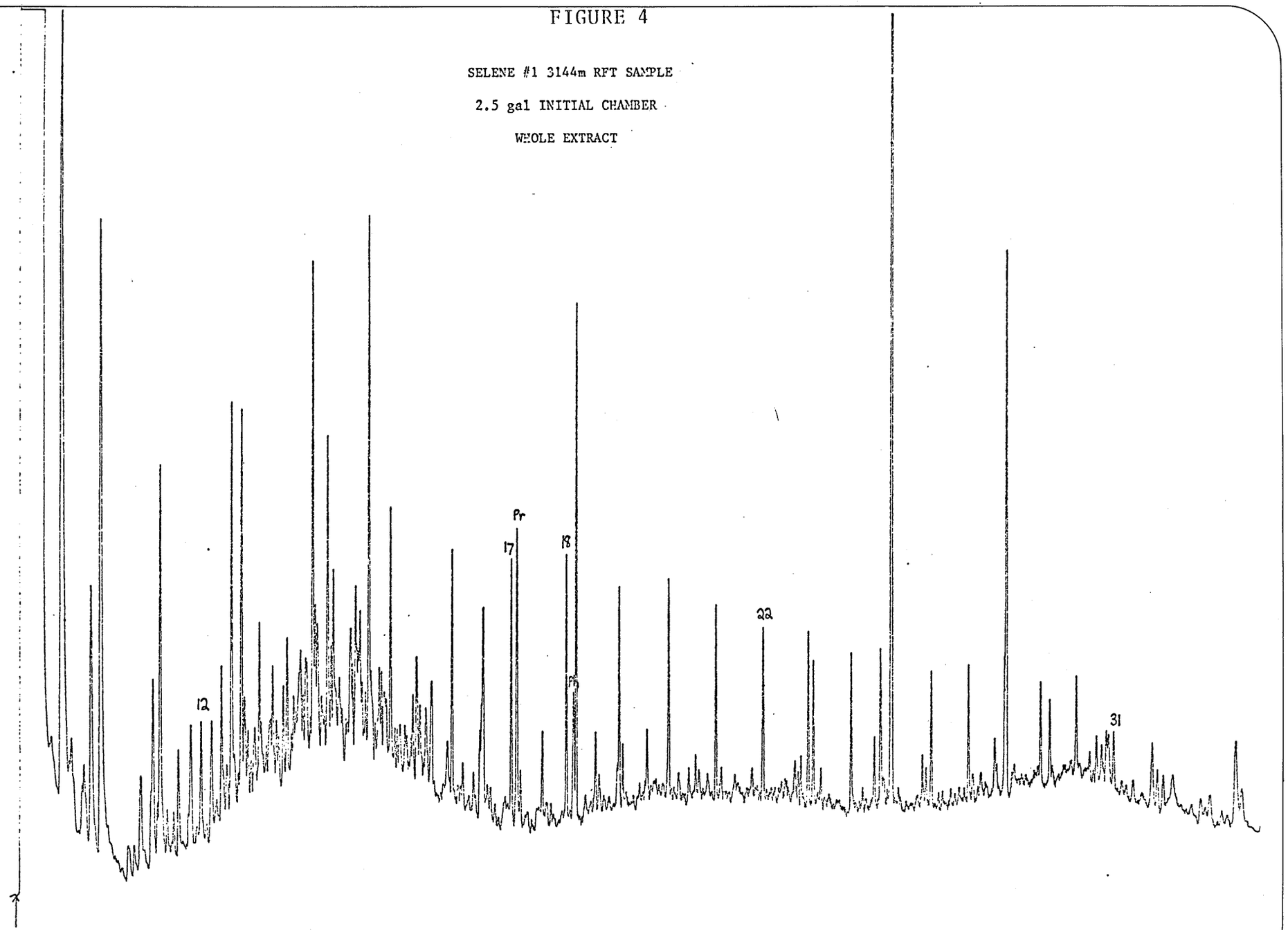

TABLE I

WELLNAME = SELENE #1

DATE OF JOB = FEBRUARY, 1983

ROCK-EVAL PYROLYSIS DATA

DEPTH(m)	TMAX	S1	S2	S3	S1+S2	S2/S3	PI	PC	TOC	HI	OI
3030.0-3040.0	nd	nd	nd	nd	nd	nd	nd	nd	0.28	nd	nd
3040.0-3050.0	nd	nd	nd	nd	nd	nd	nd	nd	0.68	nd	nd
3050.0-3060.0	nd	nd	nd	nd	nd	nd	nd	nd	0.33	nd	nd
3060.0-3070.0	nd	nd	nd	nd	nd	nd	nd	nd	0.51	nd	nd
3070.0-3080.0	nd	nd	nd	nd	nd	nd	nd	nd	0.52	nd	nd
3080.0-3090.0	412	0.41	13.79	0.72	14.20	19.15	0.03	1.18	3.79	363	18
3090.0-3100.0	413	0.58	29.09	1.80	29.67	16.16	0.02	2.46	6.92	420	26
3100.0-3110.0	412	0.25	15.67	0.74	15.92	21.18	0.02	1.32	4.19	373	17
3110.0-3120.0	423	0.14	8.83	0.74	8.97	11.93	0.02	0.74	2.74	322	27
3120.0-3130.0	417	0.19	9.03	0.78	9.22	11.58	0.02	0.77	2.92	309	26
3130.0-3140.0	412	0.53	22.89	1.64	23.42	13.96	0.02	1.94	5.92	386	27
3140.0-3150.0	414	0.57	19.88	1.44	20.45	13.81	0.03	1.70	5.04	394	28
3160.0-3170.0	414	0.63	21.43	1.48	22.06	14.48	0.03	1.83	5.37	399	27
3170.0-3180.0	412	0.41	17.72	1.09	18.13	16.26	0.02	1.50	4.39	403	24
3180.0-3190.0	418	0.21	9.23	0.91	9.44	10.14	0.02	0.78	2.89	319	31
3190.0-3200.0	416	0.40	16.39	1.11	16.79	14.77	0.02	1.39	4.43	369	25
3200.0-3210.0	413	0.53	18.41	1.09	18.94	16.89	0.03	1.57	4.40	418	24
3210.0-3220.0	416	0.21	8.91	0.60	9.12	14.85	0.02	0.76	2.83	314	21
3220.0-3230.0	417	0.35	13.82	0.71	14.17	19.46	0.02	1.18	3.68	375	19
3230.0-3240.0	414	0.44	18.43	0.74	18.87	24.91	0.02	1.57	4.49	410	16
3240.0-3250.0	414	1.01	33.24	1.32	34.25	25.18	0.03	2.84	7.83	424	16
3250.0-3260.0	414	1.01	35.34	1.63	36.35	21.68	0.03	3.02	8.49	416	19
3260.0-3270.0	414	0.96	30.57	1.33	31.53	22.98	0.03	2.62	7.19	425	18
3270.0-3280.0	409	0.97	24.95	0.99	25.92	25.20	0.04	2.15	6.03	413	16
3280.0-3290.0	415	1.07	28.62	1.38	29.69	20.74	0.04	2.46	6.92	413	19
3290.0-3300.0	417	1.03	31.47	1.74	32.50	18.09	0.03	2.70	8.02	392	21
3300.0-3310.0	418	0.84	32.09	1.82	32.93	17.63	0.03	2.73	8.25	388	22
3310.0-3320.0	418	0.76	25.76	1.60	26.52	16.10	0.03	2.20	6.64	387	24
3320.0-3330.0	419	0.55	19.78	1.55	20.33	12.76	0.03	1.69	5.94	332	26
3330.0-3340.0	423	0.34	14.45	1.20	14.79	12.04	0.02	1.23	4.06	355	29
3340.0-3350.0	418	0.52	11.80	1.05	12.32	11.24	0.04	1.02	3.41	346	30
3350.0-3360.0	414	2.03	76.19	3.86	78.22	19.74	0.03	6.49	23.24	327	16
3360.0-3370.0	419	0.63	34.01	1.88	34.64	18.09	0.02	2.88	8.82	385	21
3370.0-3380.0	418	1.11	41.97	2.33	43.08	18.01	0.03	3.58	11.70	358	19
3380.0-3390.0	419	0.79	37.36	2.46	38.15	15.19	0.02	3.17	10.41	358	23
3390.0-3400.0	420	0.46	22.72	1.44	23.18	15.78	0.02	1.92	6.69	339	21
3400.0-3410.0	419	0.42	18.39	1.64	18.81	11.21	0.02	1.56	5.07	362	32
3410.0-3420.0	418	0.42	10.90	1.30	11.32	8.38	0.04	0.94	3.55	307	36
3420.0-3430.0	418	0.42	13.73	1.15	14.15	11.94	0.03	1.17	3.92	350	29
3430.0-3440.0	423	0.10	1.95	0.56	2.05	3.48	0.05	0.17	0.96	203	58
3440.0-3450.0	422	0.16	3.22	0.60	3.38	5.37	0.05	0.28	1.47	219	40

TMAX = Max. temperature S2 S1 = Volatile hydrocarbons (HC) S2 = HC generating potential
S1+S2 = Potential yield S3 = Organic carbon dioxide PI = Production index
PC = Pyrolysable carbon TOC = Total organic carbon HI = Hydrogen index OI = Oxygen index

WELLNAME = SELENE #1

TABLE II

DATE OF JOB = FEBRUARY, 1983

HEADSPACE ANALYSIS DATA

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
2840.0-2845.0	256.0	25.5	36.2	19.4	18.6	355.7	99.7	28.0	15.0	1.04
2845.0-2850.0	769.5	27.4	39.2	19.1	17.0	872.2	102.7	11.8	14.6	1.12
2850.0-2855.0	536.6	20.3	31.5	16.9	15.4	620.6	84.0	13.5	13.2	1.10
2855.0-2860.0	330.8	26.2	41.5	22.8	22.2	443.5	112.7	25.4	16.2	1.03
2910.0-2920.0	11.7	2.8	3.3	2.6	2.4	22.8	11.1	48.5	2.0	1.10
2930.0-2940.0	109.5	106.4	189.2	97.9	145.0	648.1	538.6	83.1	89.6	0.68
2940.0-2950.0	49.5	30.8	61.0	45.8	69.0	256.1	206.6	80.7	36.3	0.66
2950.0-2960.0	21.9	6.5	12.4	10.3	16.4	67.6	45.7	67.5	9.0	0.63
2960.0-2970.0	15.0	3.7	8.4	4.7	8.9	40.7	25.7	63.2	3.5	0.53
3016.0	23.6	3.9	1.3	0.6	0.8	30.2	6.6	21.8	0.4	0.70
3020.0	18.1	2.1	1.7	0.5	0.6	23.0	4.9	21.4	0.2	0.81
3040.0-3050.0	28.9	36.4	4.8	4.0	1.7	75.7	46.9	61.9	1.7	2.31
3050.0-3060.0	8.8	11.6	1.8	1.6	0.5	24.4	15.5	63.7	0.6	3.27
3060.0-3070.0	5.3	6.3	1.3	0.9	0.4	14.3	8.9	62.5	0.4	2.38
3070.0-3080.0	7.6	6.3	1.7	1.1	0.8	17.4	9.8	56.5	0.7	1.51
3080.0-3090.0	98.4	40.6	29.1	7.2	7.6	183.0	84.5	46.2	2.8	0.94
3090.0-3100.0	430.4	280.0	256.4	78.6	90.9	1136.3	706.0	62.1	53.3	0.86
3100.0-3110.0	439.7	450.4	417.8	161.6	224.3	1693.7	1254.1	74.0	129.9	0.72
3110.0-3120.0	528.2	513.3	580.5	229.9	294.6	2146.6	1618.4	75.4	190.4	0.78
3120.0-3130.0	848.4	600.0	528.7	208.3	288.5	2473.8	1625.5	65.7	159.7	0.72
3130.0-3140.0	1720.9	786.1	588.0	243.8	338.3	3677.1	1956.2	53.2	164.4	0.72
3132.0	25.4	7.6	10.4	6.7	13.1	63.2	37.8	59.8	3.3	0.51
3135.0	141.7	46.5	50.2	21.4	48.8	308.5	166.8	54.1	11.4	0.44
3140.0	51.1	13.3	17.8	9.3	18.2	109.8	58.7	53.5	3.8	0.51
3140.0-3150.0	168.4	111.3	108.9	51.9	74.6	515.1	346.8	67.3	48.4	0.70
3160.0-3170.0	0.4	0.2	0.1	<0.1	<0.1	0.8	0.4	52.1	<0.1	bdl
3170.0-3180.0	392.5	108.7	42.3	19.0	25.1	587.6	195.1	33.2	17.0	0.76
3180.0-3190.0	692.4	209.7	94.8	52.4	64.2	1113.5	421.0	37.8	41.6	0.82
3190.0-3200.0	1602.4	474.7	206.7	92.4	111.5	2487.8	885.3	35.6	82.2	0.83
3200.0-3210.0	1529.0	478.5	194.7	81.7	115.3	2399.1	870.1	36.3	36.4	0.71
3210.0-3220.0	724.1	241.8	91.4	34.3	48.6	1140.3	416.2	36.5	13.4	0.71
3220.0-3230.0	1418.0	391.4	124.2	39.2	47.8	2020.7	602.8	29.8	19.4	0.82
3230.0-3240.0	3131.4	699.7	184.8	56.2	47.5	4119.7	988.3	24.0	21.3	1.18
3240.0-3250.0	3165.6	728.2	141.9	37.9	19.9	4093.5	927.9	22.7	10.0	1.91
3250.0-3260.0	4580.8	1015.3	173.6	44.7	19.8	5834.3	1253.5	21.5	7.6	2.26
3260.0-3270.0	15882.9	4435.5	812.9	200.4	110.8	21442.4	5559.5	25.9	47.2	1.81
3270.0-3280.0	5149.4	925.9	147.9	29.1	15.3	6267.8	1118.3	17.8	8.8	1.90
3280.0-3290.0	945.6	137.5	30.5	6.0	2.4	1122.0	176.4	15.7	1.4	2.48
3290.0-3300.0	5735.1	1036.1	251.2	52.4	18.4	7093.3	1358.2	19.1	9.7	2.85
3300.0-3310.0	11916.0	1780.6	431.8	83.6	30.5	14242.4	2326.4	16.3	11.8	2.74
3313.0	219.1	29.6	18.7	6.6	4.7	278.8	59.6	21.4	1.6	1.40
3310.0-3320.0	8262.7	1429.5	369.7	77.8	26.7	10166.4	1903.7	18.7	14.8	2.92
3320.0-3330.0	306.0	21.5	4.6	0.8	0.3	333.1	27.2	8.2	0.1	3.17
3330.0-3340.0	2230.3	251.7	76.0	13.7	6.7	2578.3	348.0	13.5	2.5	2.05
3340.0-3350.0	15257.6	2008.5	437.5	65.5	41.5	17810.6	2553.0	14.3	20.1	1.58
3350.0-3360.0	64267.6	6120.4	953.3	230.9	68.4	71640.6	7373.0	10.3	52.4	3.38
3360.0-3370.0	40851.1	6111.9	936.7	228.3	63.0	48191.1	7340.0	15.2	47.8	3.63
3370.0-3380.0	17190.0	2849.2	313.7	68.6	15.8	20437.3	3247.3	15.9	25.7	4.33
3380.0-3390.0	34340.6	5482.8	630.5	149.8	33.7	40637.4	6296.7	15.5	57.6	4.45
3390.0-3400.0	46272.8	9638.0	1451.3	222.3	95.4	57679.7	11406.9	19.8	150.0	2.33

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

TABLE II

WELLNAME = SELENE #1

DATE OF JOB = FEBRUARY, 1983

HEADSPACE ANALYSIS DATA

DEPTH(m)	METHANE	ETHANE	PROPANE	ISOBUTANE	BUTANE	C1-C4	C2-C4	%WETNESS	C5-C7	i-C4/n-C4
3400.0-3410.0	28624.9	6193.0	1152.0	149.4	110.0	36229.4	7604.5	21.0	122.8	1.36
3410.0-3420.0	500.0	123.4	33.1	4.6	4.6	665.7	165.7	24.9	3.7	1.00
3420.0-3430.0	2704.2	829.7	273.2	40.2	42.9	3890.3	1186.1	30.5	37.4	0.93
3430.0-3440.0	10487.4	2860.3	1230.7	185.2	226.6	14990.2	4502.8	30.0	223.1	0.82
3440.0-3450.0	8812.4	1807.6	803.8	127.7	163.3	11714.9	2902.5	24.8	130.0	0.78
3450.0-3460.0	3394.0	1177.4	610.2	99.7	140.9	5422.1	2028.1	37.4	89.3	0.71
3460.0-3470.0	8980.1	2074.3	619.2	93.9	108.2	11875.8	2895.7	24.4	78.8	0.87
3470.0-3480.0	1476.0	564.3	138.2	16.6	21.3	2216.4	740.4	33.4	14.0	0.78
3480.0-3490.0	1241.9	431.8	129.7	18.4	21.1	1842.8	600.9	32.6	12.6	0.87
3490.0-3500.0	11570.6	4028.1	1668.1	250.1	312.2	17829.1	6258.5	35.1	208.5	0.80
3500.0-3510.0	18578.5	7393.1	1762.9	227.4	252.8	28214.6	9636.1	34.2	188.3	0.90
3510.0-3520.0	12161.1	3273.6	1110.7	165.1	212.0	16922.6	4761.5	28.1	135.1	0.78
3520.0-3530.0	19497.4	3978.9	1841.6	285.5	438.3	26041.7	6544.3	25.1	261.8	0.65
3530.0-3539.0	15065.0	3608.4	1585.3	215.8	337.9	20812.4	5747.4	27.6	199.0	0.64

N.B. 1. GAS CONCENTRATIONS EXPRESSED IN PPM (VOL. GAS/VOL. SEDIMENT)
2. bdl = BELOW DETECTION LIMIT

ANALABS

ANALYTICAL CHEMISTS

52 Murray Road
Welshpool
W.A. 6106
Tel: 458 7999

TABLE IIIA

CERTIFICATE OF ANALYSIS

For: Phillips
44 St George's Tce
Perth
W.A. 6000

Our ref: 82.0.01.26828

Your ref:

Date: 10.02.1983

Description of Samples: Two water samples were received on the 09.02.1983 for chemical analysis.

Method of Analysis:		Sample No.		
Chemical Data		RFT Selene 1 3144m 1 gal		
pH		6.3		
Conductivity(u siemens/cm)		57400		
T.F.R. (calculated)		36740		
		mg/l	m equiv/l	
Sodium	Na+	12050	524.1	
Potassium	K+	396	10.13	
Calcium	Ca++	135	6.737	
Magnesium	Mg++	190	15.64	
Soluble Iron	Fe	3.9	-	
Chloride	Cl-	17750	500	
Carbonate	CO3--	<0.3	-	
Bi-Carbonate	HCO3-	285.5	4.68	
Sulphate	SO4--	2679	55.81	
Nitrate	NO3-	1.392	0.0224	
Sum of Ions		33490		

Analyst: M.A. CHAPMAN A.P.T.C., A.R.A.C.I., A.A.I.M.M.

Analytical Chemist

ANALABS

ANALYTICAL CHEMISTS

52 Murray Road
Welshpool
W.A. 6106
Tel: 458 7999

TABLE IIIB

CERTIFICATE OF ANALYSIS

For: Phillips
44 St George's Tce
Perth
W.A. 6000

Our ref: 82.0.01.26828
Your ref:
Date: 10.02.1983

Description of Samples: Two water samples were received on the 09.02.1983 for chemical analysis.

Method of Analysis:		Sample No.	
Chemical Data		RFT Selene 1 3144m 2.5 gal	
pH		6.65	
Conductivity(u siemens/cm)		56700	
T.F.R. (calculated)		36290	
		mg/l	m equiv/l
Sodium	Na+	12700	552.4
Potassium	K+	396	10.13
Calcium	Ca++	65	3.244
Magnesium	Mg++	80	6.583
Soluble Iron	Fe	0.95	-
Chloride	Cl-	17890	504
Carbonate	CO3--	<0.3	-
Bi-Carbonate	HCO3-	352.6	5.78
Sulphate	SO4--	2817	58.69
Nitrate	NO3-	1.645	0.0265
Sum of Ions		34300	

Analyst: M.A. CHAPMAN A.P.T.C., A.R.A.C.I., A.A.I.M.M.
Analytical Chemist

TABLE IV

Results of the Hydrocarbon Analyses performed on two Water samples

A. C_1 - C_7 light hydrocarbon

	C_1 ppm	C_2 ppm	C_3 ppm	i C_4 ppm	n C_4 ppm	C_5-C_7 ppm	% Gas Wetness	i C_4/n C_4
RFT 3144m 1 gal	107.0	174	6.2	.5	.9	3.8	18.9	.58
RFT 3144m 2½ gal	231.0	40.0	15.0	1.6	3.0	4.1	20.5	.53

B. C_{12}^+ Heavy Hydrocarbon

	EOM ppm
RFT 3144m 1 gal	22.8
RFT 3144m 2½ gal	28.5

EOM - Extractable Organic Matter

****

APPENDIX I

THEORY AND METHOD

1. PREPARATION OF SAMPLES

The samples provided for geochemical studies are firstly, where necessary, carefully air dried. Then they are crushed to 1/8" chips using a van Gelder jaw crusher, and finally they are crushed to 0.1mm using an NV Tema grinder.

2. TOC DETERMINATIONS

The total organic carbon value (TOC) was determined on the unextracted sediment sample. The value was determined by treating a known weight of sediment with dilute HCl to remove carbonate minerals, and then heating the residue to approximately 1700 ^{o}C (Leco Induction Furnace) in an atmosphere of pure oxygen. The carbon dioxide produced was absorbed on a "Carbosorb" tower. The weight of carbon dioxide produced was then used to calculate %TOC in the sediment.

3. ROCK-EVAL PYROLYSIS

Rock-Eval pyrolysis is carried out by placing approximately 100mg of the crushed sample into a crucible and then subjecting it to the following pyrolysis cycle:

Stage (i) - Sample purged with helium for 3.5 minutes outside of heated part of pyrolysis furnace;

Stage (ii) - Sample heated at 300^{o}C for 3 minutes to liberate free petroleum (S_1 peak);

Stage (iii)- Sample heated from 300^{o}C to 550^{o}C at 25^{o}C/minute to produce petroleum from kerogen (S_2 peak). The furnace is maintained at 550^{o}C for one minute. Carbon dioxide produced during this pyrolysis up to 390^{o}C (550^{o}C in the case of the carbonate-free sediment) is absorbed on a special column;

Stage (iv) - During cool-down period the carbon dioxide produced during pyrolysis is measured (S_3 peak).

The units used for Rock-Eval data are as follows:

S_1, S_2, S_3 = kg/tonne of rock
T_{max} = ^{o}C
Hydrogen Index = mg HC/g TOC
Oxygen Index = mg CO_2/g TOC

Rock-Eval data is most commonly used in the following manner:

(i) S_1 - indicates the level of oil and/or gas already generated by the sample.

(ii) S_1+S_2 - referred to as the genetic potential this parameter is used for source rock evaluation according to the following criteria:

<2	kg/tonne	Poor
2-6	kg/tonne	Moderate
>6	kg/tonne	Good

(iii) $S_1/(S_1+S_2)$ - this parameter is the production index which is a measure of the level of maturity of the sample.

(iv) T_{max} - the temperature corresponding to the S_2 maxima. This temperature increases with increasingly mature sediments.

(v) HI, OI - the hydrogen ($[S_2 x 100]/TOC$) and oxygen ($[S_3 x 100]/TOC$) indices when plotted against one another provide information about the type of kerogen contained in the sample and the maturity of the sample.

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APPENDIX NO. 11

BASIC HYDROCARBON SOURCE ROCK POTENTIAL ANALYSIS OF SELENE NO. 1 x CORE CHIPS AND CORE SAMPLES, GIPPSLAND BASIN, OFFSHORE AUSTRALIA

PHILLIPS 66

INTER-OFFICE CORRESPONDENCE / SUBJECT:
BARTLESVILLE, OKLAHOMA

March 8, 1983

Basic Hydrocarbon Source Rock Potential Analysis of PPCo Selene-1X Core Chips and Sidewall Core Samples, Gippsland Basin, Offshore Australia.
Project No. RA4057
EPS Report No. 2464L

BPS-042-83

O. J. Koop (r) N. C. Tallis
Perth Office

Summary and Conclusions

As telexed to your office February 28, 1983, no significant liquid hydrocarbon source rock potential is indicated at existing maturity levels in seven core chips and 13 sidewall core samples from the 2635-3526m interval of the captioned well. The section above 3151.8m is thermally immature for oil generation with vitrinite reflectance values ranging from Ro .44 to .49. The portion below 3157.55m is only in the marginal, very earliest stage of maturity for oil generation with Ro values ranging .50 to .51.

Two samples (3164m and 3305m), being in marginal early stage maturity, might have begun to generate oil, but certainly not of significant quantity. Also, sidewall core sample 3357m (from a coaly interval) has probably generated some biogenic gas unrelated to thermal alteration.

As indicated above, these samples have no significant source rock potential at their present maturity levels. It may be helpful, however, to consider the potential of these samples at hypothetical higher levels of maturity. Given greater depth of burial and thermal maturity in the peak range for oil generation (Ro .65 to 1.0), the following source rock potential would be indicated:

Core Spl. 3142.9m	Primary source rock potential for oil generation.
Sidewall Spl. 3305m	Secondary source rock potential for oil generation.
Core Spl. 3151.8m	Secondary source rock potential for oil generation.

Sidewall Spl. 3357m	Secondary source rock potential for oil generation.
Sidewall Spl. 3164m	?Secondary source rock potential for oil generation.

On the other hand, if this section were found in the peak gas generation maturity range (Ro 1.3 to 3.0), the previously generated oil would have converted to gas and condensate (unless it had migrated to a cooler regime) and the following additional potential would be indicated:

Sidewall Spl. 3357m	Significant source rock potential for gas and condensate generation.
Core Spl. 3142.3m	?Source rock potential for gas and condensate generation.

This work was requested in N. C. Tallis' telex to C. D. Davidson on February 8, 1983. Included in this report are a source rock plot and a pyrolysis data chart, in addition to printouts of individual kerogen and pyrolysis data. Our present pyrolysis plotting/reporting program only recognizes depths to the nearest foot or meter; therefore, the tenths of a meter were dropped on the pyrolysis printout.

Discussion

It is probable that the sidewall core samples (3164m and 3305m) mentioned in the summary as possibly generating insignificant liquid hydrocarbons have not generated sufficient quantities of oil to overcome the natural absorptivity of the rocks; therefore, it is unlikely that expulsion has occurred. It is probable, however, that the cut and fluorescence noted at these horizons on the lithology log result from this early stage generation.

Sidewall core sample 3357m is suggestive of a coal or coaly shale (as the lith log indicates), with a total organic carbon content of 19.97 wt.%. It should be noticed it also has an oil prone kerogen content of approximately 40% (see kerogen printout). This sample, therefore, has full maturity range source rock potential; a) biogenic gas generation by the anaerobic degradation of the dominantly abundant cellulosic gas prone kerogen, unrelated to thermal alteration, b) secondary source rock potential for oil generation if found in peak oil generation range thermal maturity, and c) significant source rock potential for gas and condensate generation where found in gas generation phase thermal maturity.

Four other samples have favorable visual kerogen parameters for liquid hydrocarbon source rock potential. Pyrolysis, however, precludes this interpretation. Core chip samples 3141.9m and 3148.35m, along with sidewall core samples 2834m and 3526m, have hydrogen index

alues well below 300 (see pyrolysis chart and printout). These lower values, when associated with thermal immaturity (or marginal maturity) nd favorable oil prone kerogen content, indicate the kerogen was probably oxidized prior to, or during, burial which destroyed its oil potential.

A note at 2895m on the lith log, states that "Soltex in mud auses cut flu" (cuttings fluorescence?). This fluorescence is due to the various asphaltic components of the Soltex mud additive (see rilling Specialties Company "Product Literature" catalog). That product is only about 75% water soluble; therefore, mud contamination (either from the mud cake or porosity invasion) is possible in these amples. The dull yellow fluorescence of Soltex could be easily confused with the dull yellow to orange fluorescence, seen at this maturity level, of the oil prone alginite and cutinite indigenous in these samples. This contamination would tend to slightly high grade ur evaluation of liquid hydrocarbon source rock potential. It is elieved, however, that contamination has not affected the source rock potential evaluation of these samples. The one exception is sidewall ore sample 3164m. Analyses on this sample indicate ?secondary source ock potential for oil generation if found at higher maturity levels. It would be downgraded to essentially no significant source rock otential if the above contamination is a factor.

Dennis R. Logan

Approved: E. A. Stanley
E. A. Stanley

RL/sjv

Attachments

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] NORMALIZED TO 100% DRY VOLUME [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] TOTAL [redacted] EXT
(LIQUID PHASE) (GAS PHASE) NO. OF ORGANIC [redacted]

SAMPLE I.D.	TYPE	TAI	EXI-NITE	ALGI-NITE	VITRI-NITE	INERTI-NITE	RO MEAN	STND. DEV	MODE	RANGE LOW	RANGE HIGH	VIT. READINGS	CARBON (WT %)	MA (P
2635 METERS	SW	2	10.	40.	20.	30.							0.47	
2800 METERS	SW	2	10.	60.	10.	20.							0.23	
2824 METERS	SW	2	5.	55.	20.	20.	0.44	0.05	0.44	0.35	0.59	66	0.38	
2834 METERS	SW		5.	55.	20.	20.							1.51	
2844 METERS	SW	2	15.	30.	30.	25.							0.29	
2865 METERS	SW	2	5.	65.	15.	15.							0.09	
2950 METERS	SW	2	10.	65.	15.	10.							0.20	
2998 METERS	SW	2	10.	10.	40.	40.	0.49	0.05	0.47	0.40	0.61	81	1.37	
3141.9METERS	C	2	15.	10.	35.	40.	0.49	0.03	0.48	0.41	0.59	94	1.64	
3142.3METERS	C	2	15.	35.	20.	30.							1.35	
3142.9METERS	C	2	20.	40.	20.	20.							2.71	
3149.3METERS	C	2	10.	15.	35.	40.							1.23	
3151.8METERS	C	2	15.	30.	25.	30.	0.49	0.02	0.49	0.45	0.55	71	2.72	
3153.9METERS	C	2	10.	40.	20.	30.							0.09	
3157.5METERS	C	2+	15.	10.	35.	40.	0.51	0.04	0.50	0.44	0.60	51	0.16	
3164 METERS	SW	2+	20.	40.	20.	20.	0.50	0.02	0.52	0.47	0.55	56	2.16	
3357 METERS	SW	2+	15.	25.	20.	40.	0.50	0.02	0.48	0.47	0.54	78	19.97	
3415 METERS	SW	2+	10.	20.	25.	45.							0.16	
3526 METERS	SW	2+	10.	20.	30.	40.	0.51	0.03	0.53	0.43	0.59	83	1.29	

TERMINOLOGY USED FOR SOURCE ROCK PLOT

TAI = THERMAL ALTERATION INDEX (SPORE COLOR) (1-2 YELLOW) (2-3 BROWN) (3-4 DARK BROWN) (5 BLACK)
EXINITE = POLLEN AND SPORE EXINE + PLANT CUTICLES + RESINS + OTHER STRONGLY FLUORESCENT ORGANIC MATERIALS + AMORPHOUS HERBACEOUS (IF RECOGNIZABLE AS FROM TERRESTRIAL SOURCE - IF NOT IT IS RECORDED UNDER ALGINITE)
ALGINITE = (ALGAL DEBRIS - CYSTS AND BODIES) + AMORPHOUS SAPROPEL
VITRINITE = WOODY TISSUE (ALTERED TO HUMIC COMPOUNDS) + NONFLUORESCENT STRUCTURED TRANSLUCENT MATERIAL
INERTINITE = COALY MATERIAL INCLUDING FUSINITE, SEMIFUSINITE, PSEUDOVITRINITE, MACRINITE, & INERTODETRINITE
* RATIO = EOM / (1.25 * TOC)

SELENE-1, GIPPSLAND BASIN, AUSTRALIA

EPS REPORT # 2464L
TABLE

PYROLYSIS DATA

DEPTH RANGE METERS	TOTAL ORGANIC CARBON WEIGHT %	S1 PEAK MG.HC/ G.ROCK	S2 PEAK MG.HC/ G.ROCK	PRODUCTION INDEX S1/(S1+S2)	TEH/TOC MG.HC/ G.ORG.C	HYDROGEN INDEX MG.HC/G.ORG.C		
2835	0.47	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFO
[illegible]	0.23	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFP
[illegible]	0.36	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFQ
[illegible]	1.51	0.040	0.180	0.18	2.6	11.9	SWC	EP83BFR
[illegible]	0.29	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFS
[illegible]	0.20	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFT
[illegible]	0.21	0.070	0.230	0.23	35.0	115.0	SWC	EP83BFU
[illegible]	1.37	0.060	1.240	0.05	4.4	90.5	SWC	EP83BFV
3141	1.64	0.150	3.390	0.04	9.1	206.7	COR	EP83BGB
3142	1.39	0.130	3.010	0.04	9.6	223.0	COR	EP83BGC
3143	0.71	0.220	0.270	0.03	8.1	305.2	COR	EP83BGD
3146	1.23	0.110	1.310	0.08	8.9	106.5	COR	EP83BGE
3152	2.70	0.210	6.640	0.03	7.7	244.1	COR	EP83BGF
3154	0.21	0.0	0.0	0.0	0.0	0.0	COR	EP83BGG
3158	0.21	0.0	0.0	0.0	0.0	0.0	COR	EP83BGH
3164	2.16	0.180	4.940	0.04	8.3	228.7	SWC	EP83BFW
3315	2.26	0.130	6.350	0.02	5.8	281.0	SWC	EP83BFX
3357	19.97	3.110	67.740	0.04	15.6	339.2	SWC	EP83BFY
3415	0.21	0.0	0.0	0.0	0.0	0.0	SWC	EP83BFZ
3426	1.29	0.220	1.490	0.13	17.1	115.5	SWC	EP83BGA

PE906315

This is an enclosure indicator page.
The enclosure PE906315 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906315 has the following characteristics:

ITEM_BARCODE	= PE906315
CONTAINER_BARCODE	= PE902605
NAME	= Pyrolysis Data
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Pyrolysis Data Plot for Selene-1
REMARKS	=
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

PE906316

This is an enclosure indicator page.
The enclosure PE906316 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906316 has the following characteristics:

ITEM_BARCODE	= PE906316
CONTAINER_BARCODE	= PE902605
NAME	= Thermal Alteration Data
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Thermal Alterationa and Source Rock Potential Plots for Selene-1
REMARKS	=
DATE_CREATED	= 10/07/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX NO. 12

LOG ANALYSIS

APPENDIX NO. 12

LOG ANALYSIS

Table 1 lists all the wireline logs run in Selene No. 1. The Phillips Computer Well Log Plot (CPI), a composite of log analysis for the interval 2550 metres to 3531 metres, indicates no potential hydrocarbon productive zones (Enclosure 5). The Schlumberger Global Log (2875 metres - 3530 metres), another computer processed interpretation, also indicates no potential hydrocarbon productive zones (Enclosure 6).

The primary water saturation parameters for the Phillips CPI are:

a Rw = 0.065 at 93°C (199°F)
where 'a' is the Formation Resistivity Factor Constant = 1

Cementation Exponent (m) = 1.9 (Sandstones)
Saturation Exponent (n) = 2.0

The Schlumberger Global Interpretation used the same parameters except the Cementation Exponent (m) = 2.0.

Lithological descriptions from several sources were used to choose the appropriate coding. However, the mud log, the lithology, the daily reports, and the sidewall core descriptions are not entirely consistent. Consequently, the lithology portrayed on the Phillips Computer Well Log Plot and the Schlumberger Global Interpretation may not exactly match the final interpretation on the Composite Log (Enclosure 4).

The Phillips CPI indicated residual hydrocarbons (% pore vol.) of between 2% and 7% in the interval approximately 2832 metres to 2840 metres. Additional residual hydrocarbons were indicated lower in the section by both the Phillips CPI and Schlumberger Global. These indications, however, were sporadic and generally 1% or less. All of the hydrocarbon indications are considered insignificant.

TABLE NO. 1

SELENE NO. 1 WIRELINE LOGS

TYPE	INTERVAL	SCALE
Suite 1, Run 1		
DIL-SLS-MSFL-GR-Cal	581m - 1268m	1:200, 1:500
Suite 2, Run 1		
GR-SP-DIL-SLS	1262m - 2879m	1:200, 1:500
Run 2		
GR-LDL-CNL	2550m - 2879m	1:200, 1:500
Run 3		
HDT	2550m - 2878m	1:200, 1:500
Suite 3, Run 1		
GR-SP-DIL-SLS	2871m - 3538m	1:200, 1:500
Run 2		
NGT-CAL-LDL-CNL	2871m - 3539m	1:200, 1:500
Run 3		
HDT	2871m - 3539m	1:200, 1:500
Run 4		
VSP	55 shots	
Run 5		
RFT	20 Pressure Measurements, 2 Samples from 1 zone.	

APPENDIX NO. 13

DIPMETER INTERPRETATION

APPENDIX NO. 13

DIPMETER ANALYSIS, SELENE NO. 1

The dipmeter was run over the interval from 2550 metres to 3539 metres in Selene No. 1. This interval includes the objective sedimentary sections of the Latrobe Group. Dipmeter analysis has helped in determining the main paleocurrent directions of the various units and their respective depositional environments. The formations studied are the Colquhoun, Gurnard and Flounder Formations of the Upper Latrobe Group and the Campanian to Maastrichtian/Paleocene (?) units of the Latrobe coarse clastics.

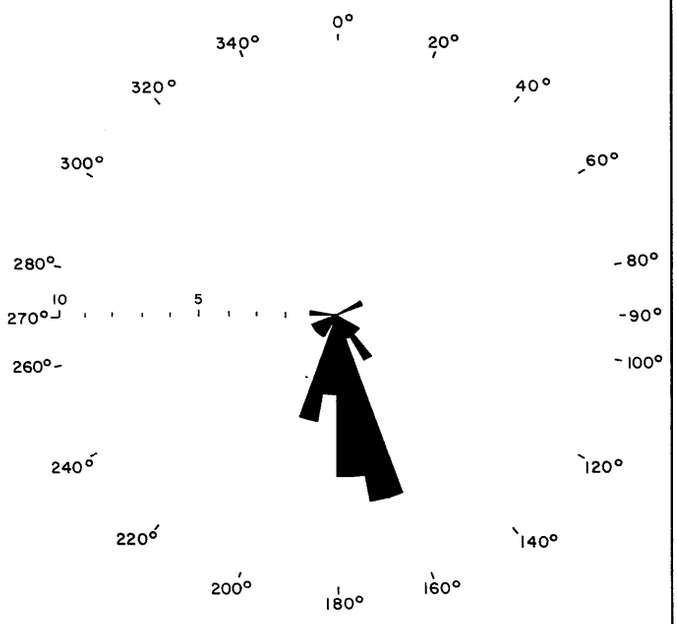
In order to study the sedimentary dips a correlation interval of 1 metre, step distance of 0.5 metre and search angle of 35 degrees was used. The standard removal of structural dip was not necessary as it remains at less than 3 degrees at an azimuth varying from southwest to west-northwest throughout the sedimentary section.

The condensed sequences at the top of the Latrobe Group, namely the Colquhoun, Gurnard and Flounder Formations, were studied as a whole because this is a dominantly-sandy section only 27 metres thick. The remainder of the Latrobe Group was studied in four units consisting of an upper sandstone from 2848 to 2925 metres, a massive sandstone from 2938 to 2986 metres, thin sandstones of the coal measures from 2986 to 3436 metres and basal sands below 3436 metres.

Polar plots were constructed to display depositional information which is unique for each situation. Three basic types of plots were made, namely, one including all dip values, another plotting dip values greater than or equal to a standard such as 5 or 10 degrees and lastly a plot based on confidence of dipmeter data. The polar plot which includes all dip values was used to determine the general sedimentary dip direction. The plot which uses dip values greater than or equal to a standard determined any trend in larger dip values which may be particularly relevant in fluvio-deltaic environments. Polar plots based on confidence of dipmeter data were used to eliminate data of poor quality which may be misleading or erroneous. Dip azimuths were grouped into 10 degree intervals for plotting purposes.

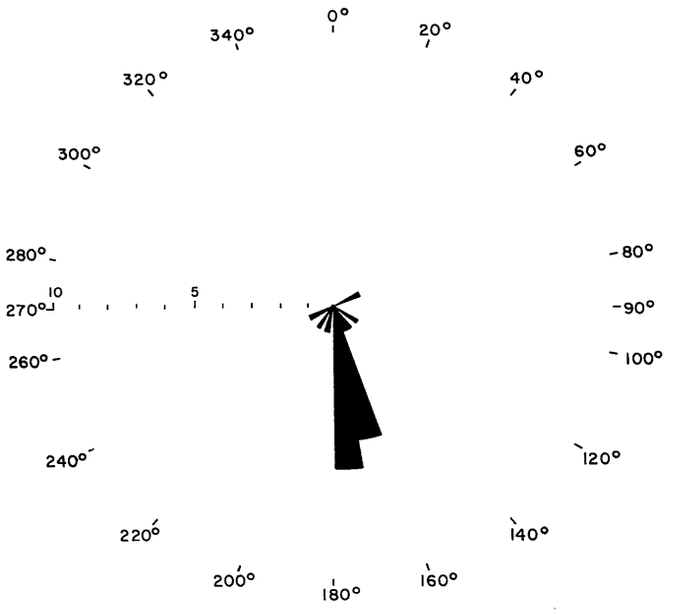
The Mid-to-Late Eocene condensed section at the top of the Latrobe Group extends from 2821 to 2848 metres and includes the Colquhoun, Gurnard and Flounder Formations. Glauconitic sandstone is the predominant sediment type except for the Colquhoun Formation (1.5m thick) which is a silty claystone. The environment of deposition changes with increasing depth going from intertidal to intertidal/estaurine/lagoonal to barrier/dune/lagoonal. Although each of these formations is separated by an unconformity the sedimentary dip direction does not change. Polar plots (Figure 1) indicate sedimentary dip is to the south, slightly southeast. Figure 1C indicates that 74.2% of all dips have a confidence level of C or higher (A is best, D is eliminated) which indicates good confidence in the data. Figure 1C also displays the percentage of all dips which are A dips, B dips and C dips. The data suggests that Eocene sediment supply was generally from the north.

ALL DIP ANGLES
n = 31



A.

DIP ANGLES ≥ 5°
n = 18

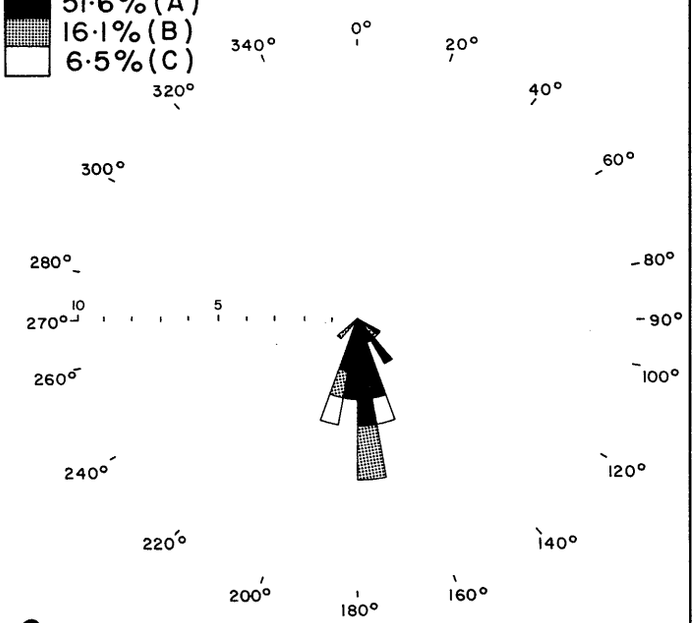


B.

CONFIDENCE LEVELS FOR ALL DIP ANGLES
n = 23

CONFIDENCE LEVEL 74·2%

51·6% (A)
16·1% (B)
6·5% (C)



C.

PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

COLQUHOUN, GURNARD AND FLOUNDER FORMATIONS
SELENE-1
2821m to 2848m

B.E.SEE MAY, 1983

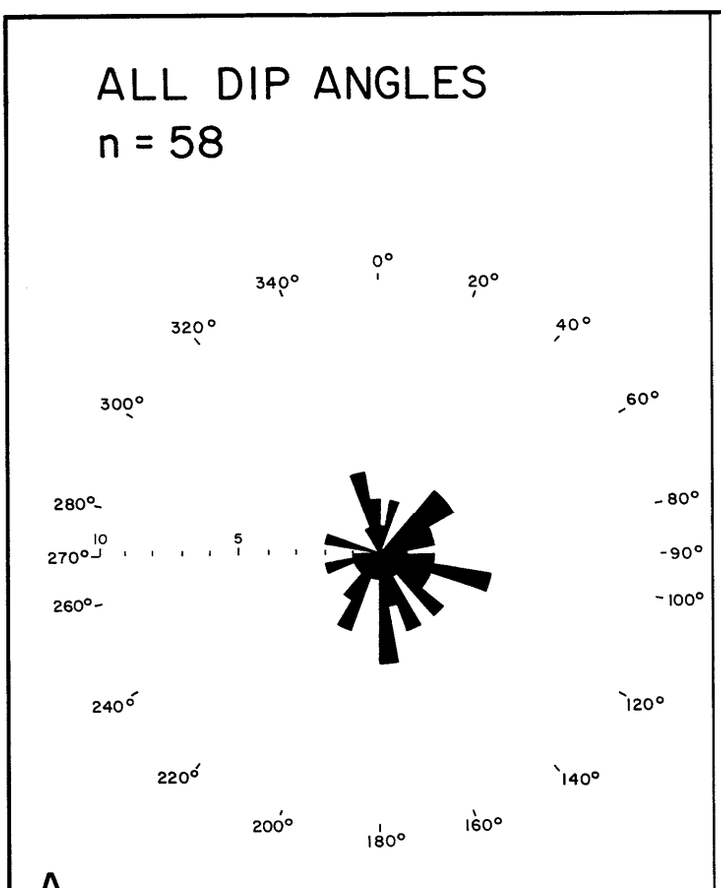
A-5756-10

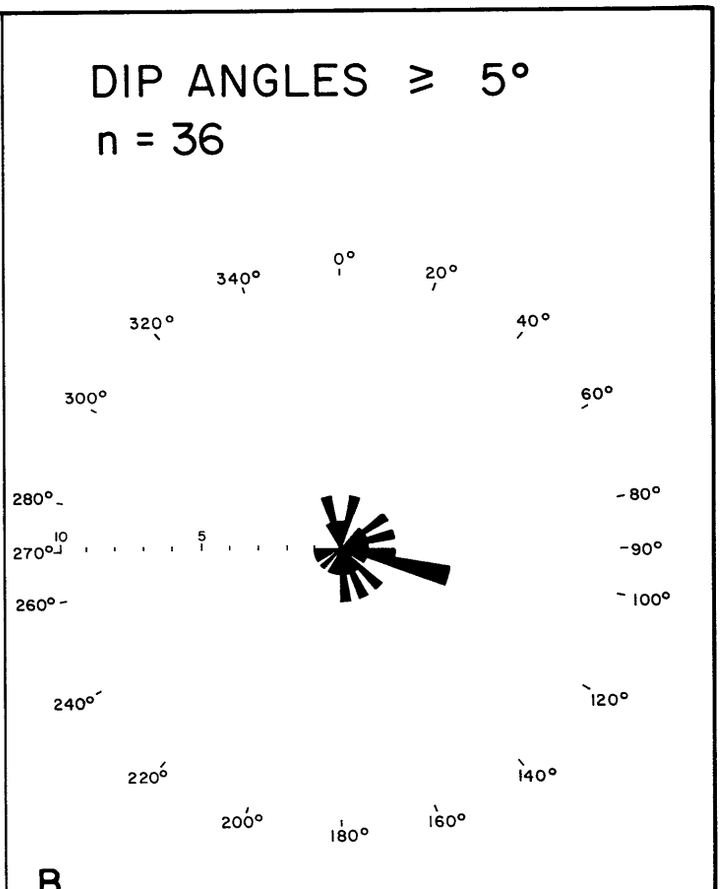
FIGURE 1

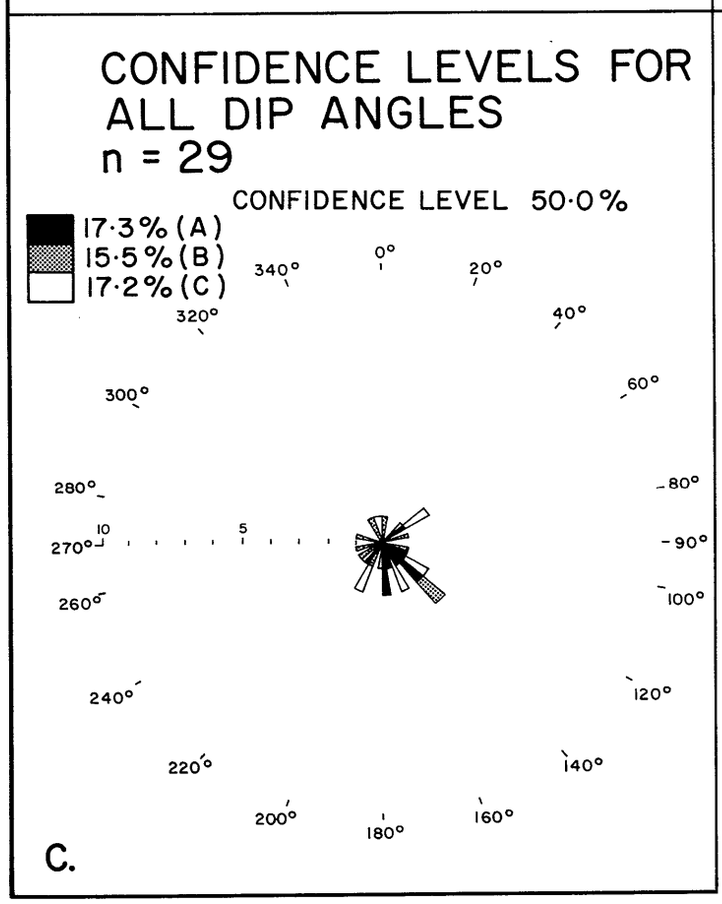
Sands of the Latrobe Coarse Clastics extend over the interval 2848 to 2925 metres in Selene No. 1. These sands are Maastrichtian to possibly Paleocene in age and are in beds from 7 to 22 metres thick. Dipmeter readings, when all dips are plotted (Figure 2A), indicate multiple sedimentary dip directions. When dips of 5° or greater are used (Figure 2B), the primary sedimentary dip direction is to the east southeast. The dipmeter confidence level plot (Figure 2C) indicates that sedimentary dip is generally to the southeast. The confidence level is only 50% and A type dips only account for 17.3% of the total. This indicates that the data is, at best, only fair.

Using paleontological data, log characteristics, lithology and dipmeter data, it is concluded that the sands between 2848 and 2925 metres represent offshore and barrier bars (Figure 6), deposited in shallower water, and probably occasionally reworked. Sediment supply was probably from the north-northwest with the shoreline running in a northeast-southwest direction. The reworking mentioned above most likely occurred during the marine transgression which drowned the barrier bars.

The massive sands of the Latrobe Group between 2938 and 2985 metres in Selene No. 1 are Maastrichtian in age and represent a true barrier island/beach strand line system. Although the dipmeter data is of questionable quality (confidence level = 37.9%), some inferences can be drawn. When all the dips are plotted (Figure 3A), the sedimentary dip is generally to the southwest with a secondary dip direction of north-northeast.







PHILLIPS AUSTRALIAN OIL COMPANY

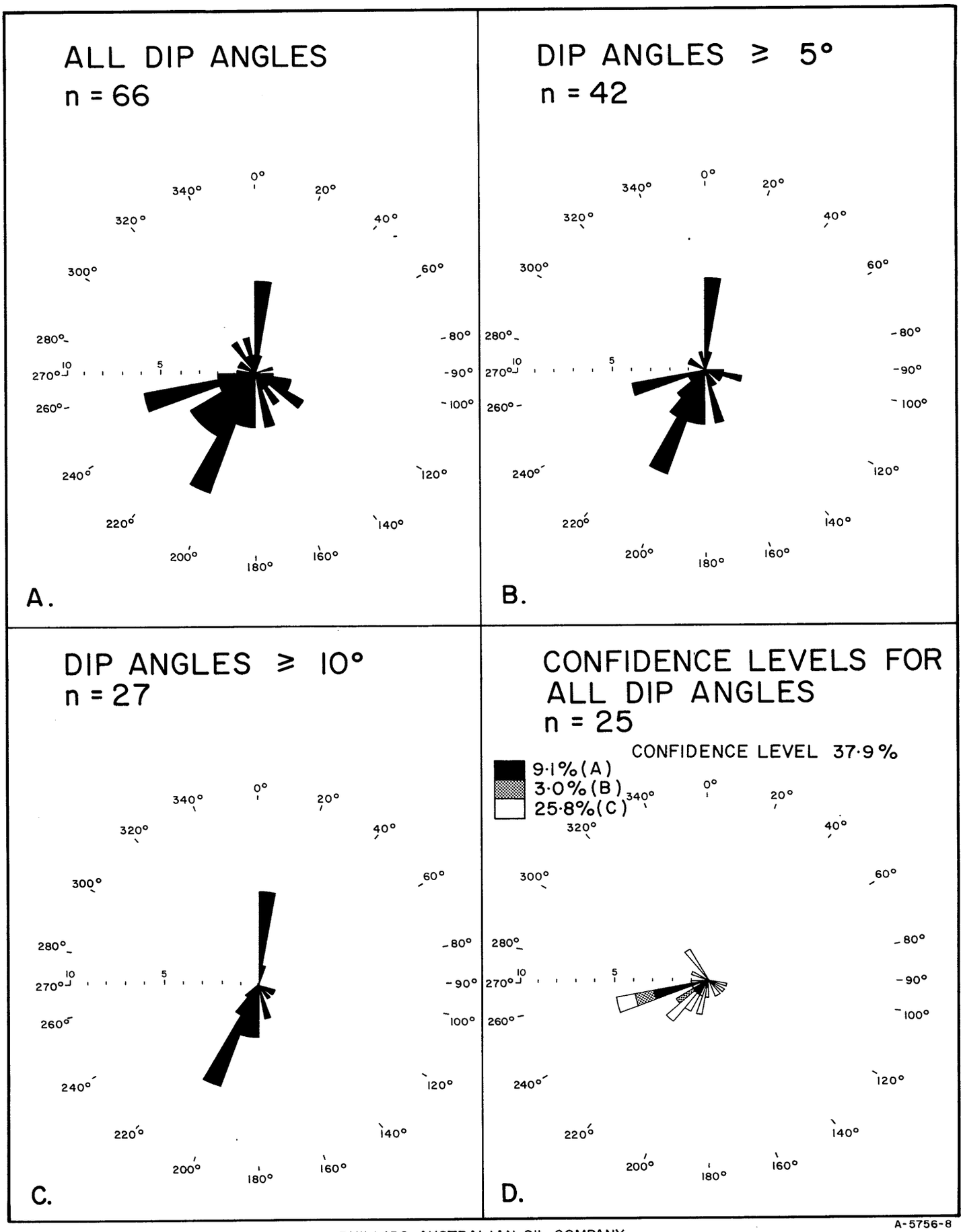
POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

LATROBE COARSE CLASTICS
SELENE-1
2848m to 2925m

B. E. SEE MAY, 1983

A-5756-7

FIGURE 2



PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA, SELENE-1

LATROBE GROUP MASSIVE SAND

2938m to 2986m

B.E.SEE MAY, 1983

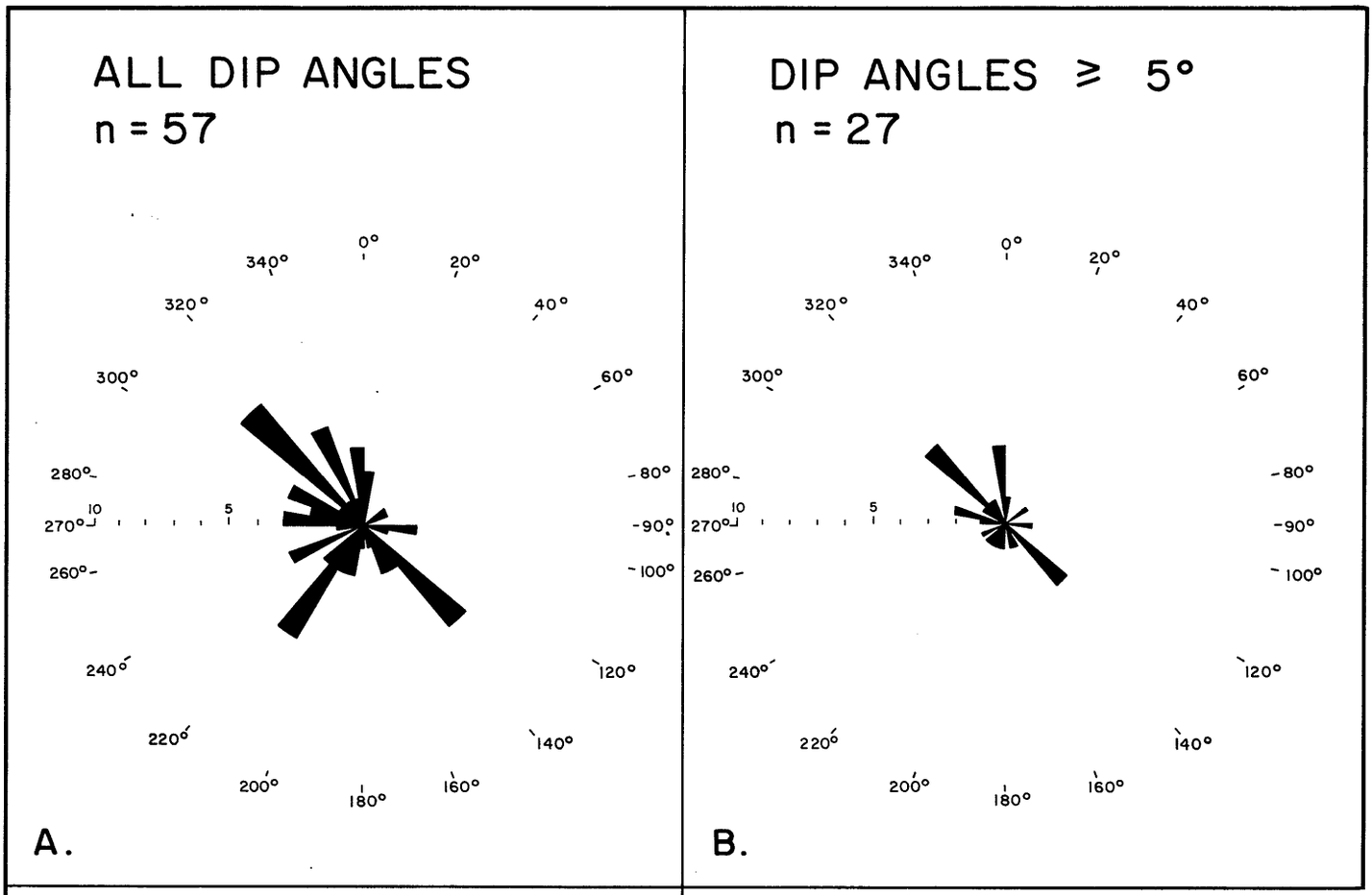
FIGURE 3

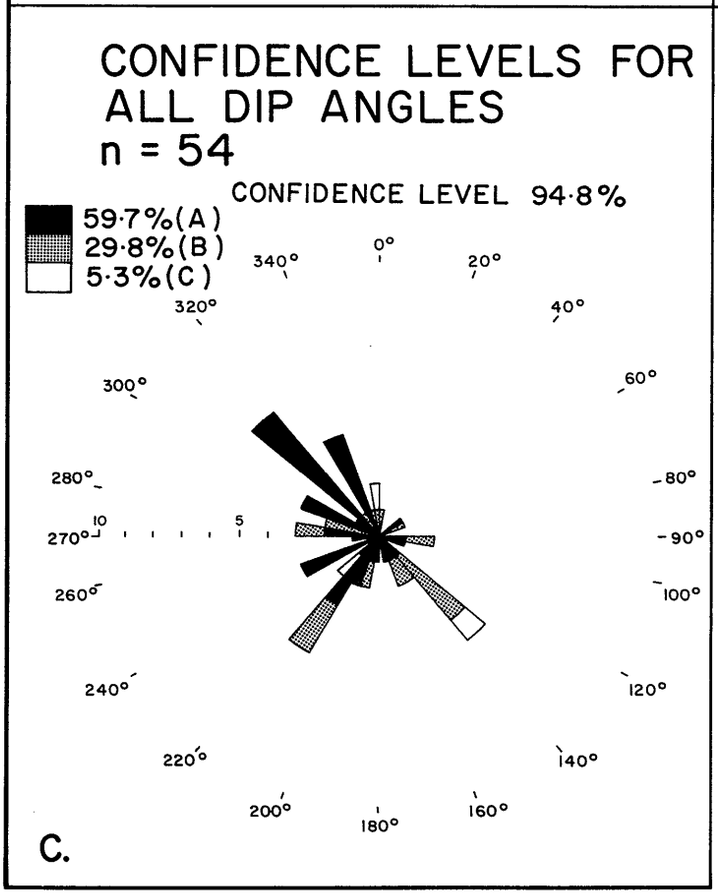
The bimodal dip is even more pronounced when dips of 5° or greater and 10° or greater (Figure 3B and C) are plotted. When D level plots are removed (Figure 3D), the confidence level plot reveals a southwesterly dip component. This indicates that most D level dips are greater than 10° (many are over 20°) and that several of these dips are to the north-northeast. It is possible that some of the north-northeasterly dips represent washover features on the lagoonal side of the barrier island.

Dip angles throughout most of the sand body decrease with depth (Figure 6) and are indicative of shoreface deposition. The high dip cycles also sugget deposition in a high energy environment. Beach and dune deposition are another possibility.

The dipmeter data, along with electric log and lithological data suggest that the sand body penetrated between 2938 and 2986 metres is a beach strand line system located on a barrier island. The barrier island system had a generally west-northwest to east-southeast orientation with sediment being deposited in a southwesterly direction. Sediment supply was from the north-northeast. This orientation differs from the orientation of the overlying barrier/offshore bar system indicating a shift in sediment supply direction.

The next group of sands studied using dipmeter techniques were those penetrated in the paludal swamp coal measures between 2986 and 3436 metres. These sands are generally thin (2-4 metres), fluvially deposited and carbonaceous. Dipmeter results are excellent in these sands and have a confidence level of 94.8% (Figure 4C). When all the dips are plotted a random series of dip directions are evident. Dips which equal or are greater than 5° also exhibit a random dip pattern (Figure 4B). The randomness of the sedimentary dip is attributed to deposition by a meandering river system that was continually changing flow direction.





PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA PALUDAL/MARSH SWAMP POINT BAR SANDS

SELENE-1

2986m to 3436m

B.E.SEE MAY, 1983

A-5756-9

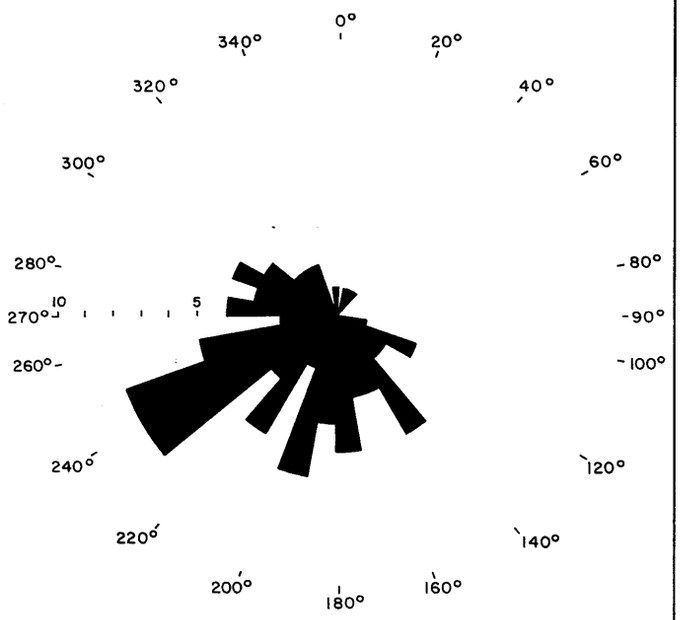
FIGURE 4

This depositional system may have also been influenced by tides which changed the flow regime and added further to the randomness of sedimentation. In Figures 4A and B northwest and southeast bimodal dip directions are indicated. These opposite dip directions (180° difference) are an excellent indication of tidal influence. The Campanian to Maastrichtian sand bodies penetrated between 2986 and 3436 metres were deposited as thin point bars in meandering tidal-influenced creeks and small tidal influenced rivers.

Although dip direction is random in this zone dip directions of northwest and southeast dominate. It is believed that these so called "tidal creeks and tidal rivers" flowed generally southeast and occasionally southwest into lagoons which were located between the mainland and an extensive barrier island system. This barrier island/lagoon system had a generally northeast to south-west trend during the Late Cretaceous in the Selene area with the source of sediment being a highland to the north.

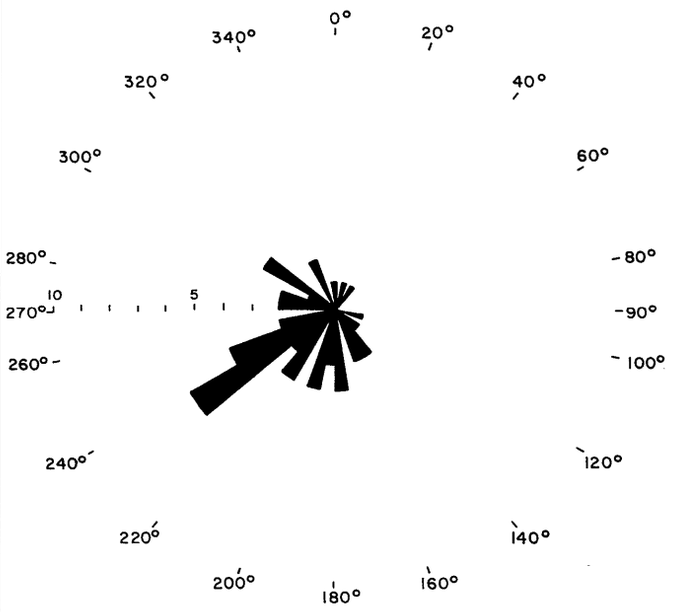
Dipmeter confidence level plots of the basal sands below 3436m in Selene No. 1 indicate a southwesterly dip with an 89% level of confidence (Figure 5C). This dip direction is also indicated when all dips are plotted and when dips of 5° or higher are plotted (Figures 5A and B). Electric logs and lithological data when used in conjunction with dipmeter plots indicate a fluvial environment of deposition. The basal sands in Selene No. 1 represent alluvium deposited by braided streams flowing in a southwesterly direction. Source of sediment was to the northeast of the Selene location.

ALL DIP ANGLES
n = 91



A.

DIP ANGLES ≥ 5°
n = 45

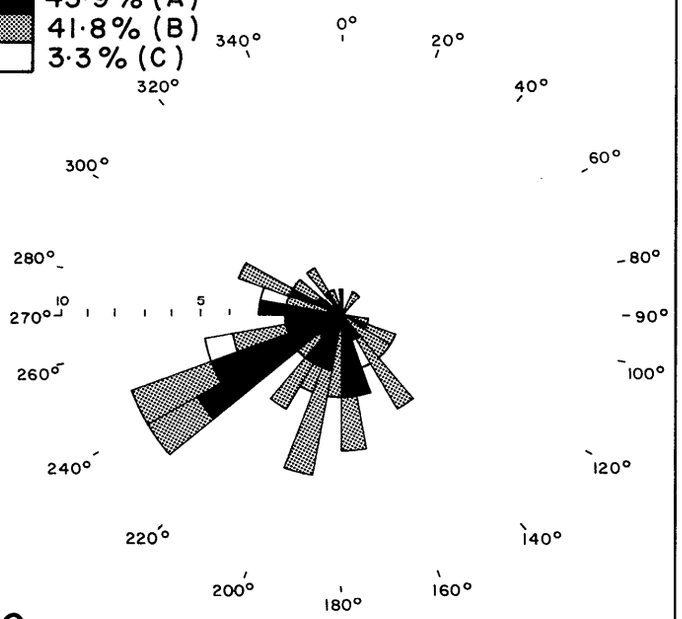


B.

CONFIDENCE LEVELS FOR ALL DIP ANGLES
n = 81

CONFIDENCE LEVEL 89·0%

43·9% (A)
41·8% (B)
3·3% (C)



C.

PHILLIPS AUSTRALIAN OIL COMPANY

POLAR PLOT OF PALEOCURRENTS MEASURED FROM DIPMETER DATA

BASAL SANDS SELENE-1
3436m to 3532m

B. E. SEE MAY, 1983

A-5756-6

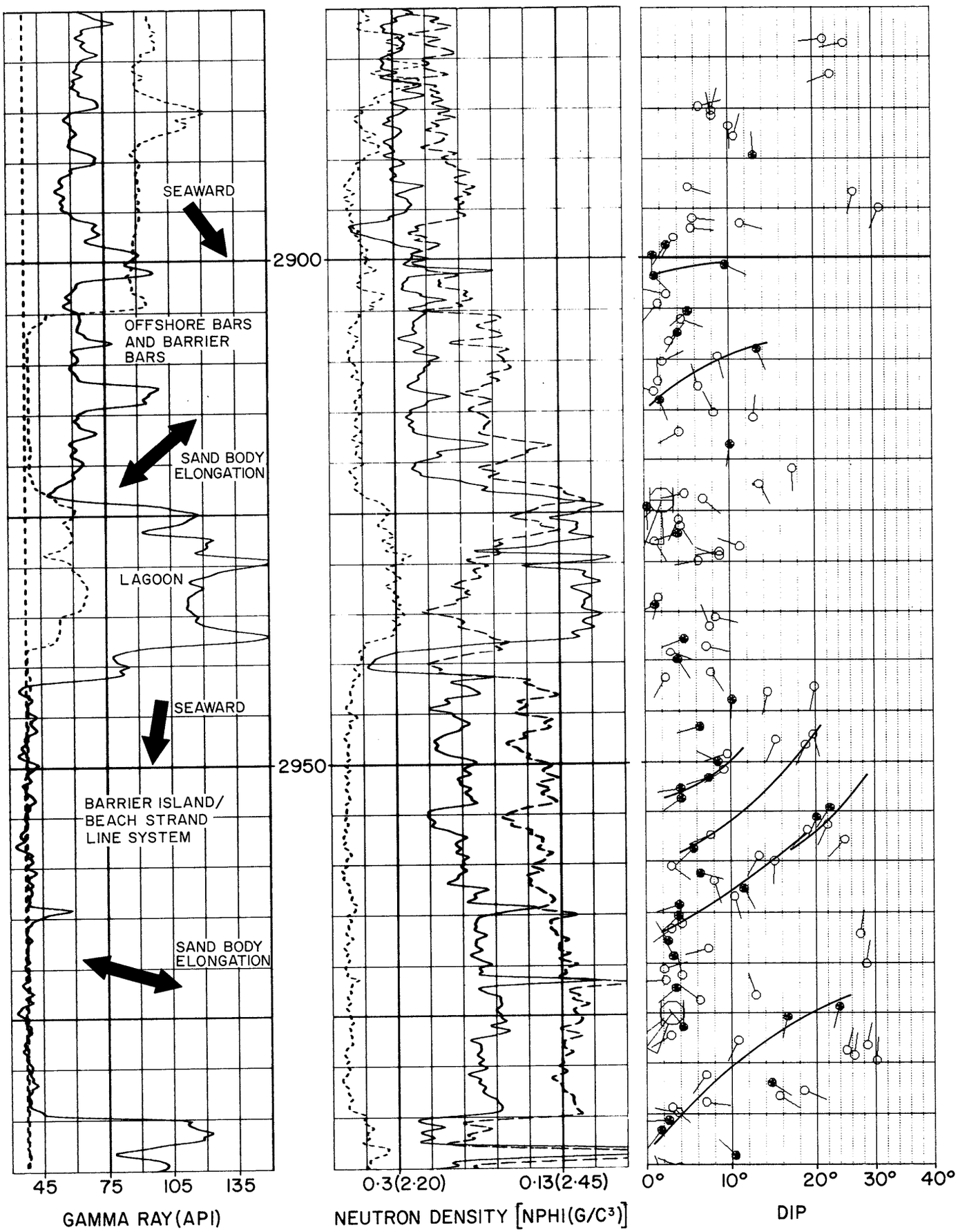
FIGURE 5

Figure 6 shows a barrier island/beach strand line system overlain by lagoonal deposits and offshore/barrier bars. The section is from the Maastrichtian Latrobe Group. The barrier island/beach strand line sand shows a smooth-to-slightly serrated cylindrical shape on the gamma-ray log, excellent porosity on the neutron-density combination and low-to-moderately high dip magnitudes with dip azimuths trending generally southwest. The cylinder shaped gamma-ray indicates a fairly uniform sand. Dip angles decrease with depth and indicate shoreface deposition. The relatively large spread on dip magnitudes indicates deposition in a fairly high energy environment. Sediment supply was from the north-northeast, with the seaward direction being to the south-southwest. The overlying offshore and barrier bars indicate a major change in depositional environment.

The lowermost bar (Figure 6), just above the lagoonal deposits, displays a slightly serrated bell shaped gamma-ray signature, good porosity on the neutron-density combination and scattered dips with a generally southeasterly dip azimuth. These factors are indicative of a marine transgression probably from the southeast. The seaward direction had changed to the southeast and sediment supply was from the northwest. These drastic environmental changes were probably related to the initial rifting of Antarctica from Australia.

Figure 7A shows small point bars deposited by meandering tidal creeks. The point bars display generally smooth bell shaped gamma-ray traces indicative of a fining upward sandstone, associated with a decrease in dip magnitude and depositional energy. Moderate-to-high dip azimuth scatter implies continuous changes in current direction. The neutron-density combination indicates good porosity.

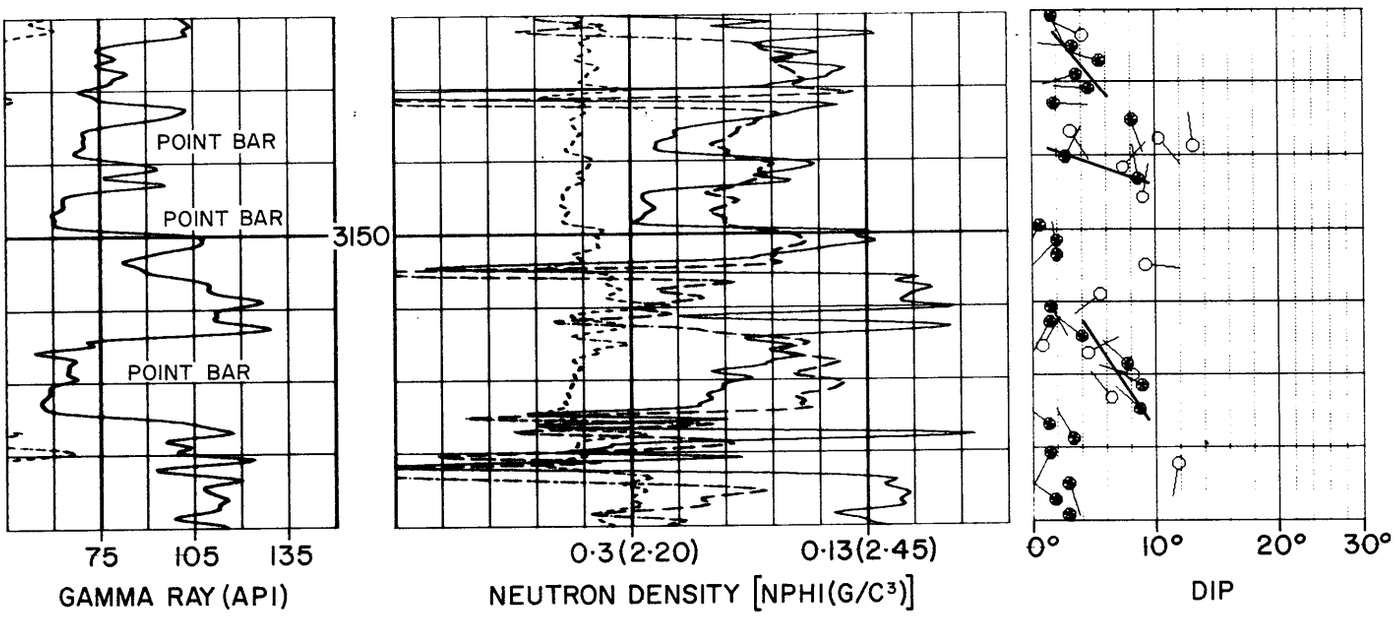
DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. SELENE-1



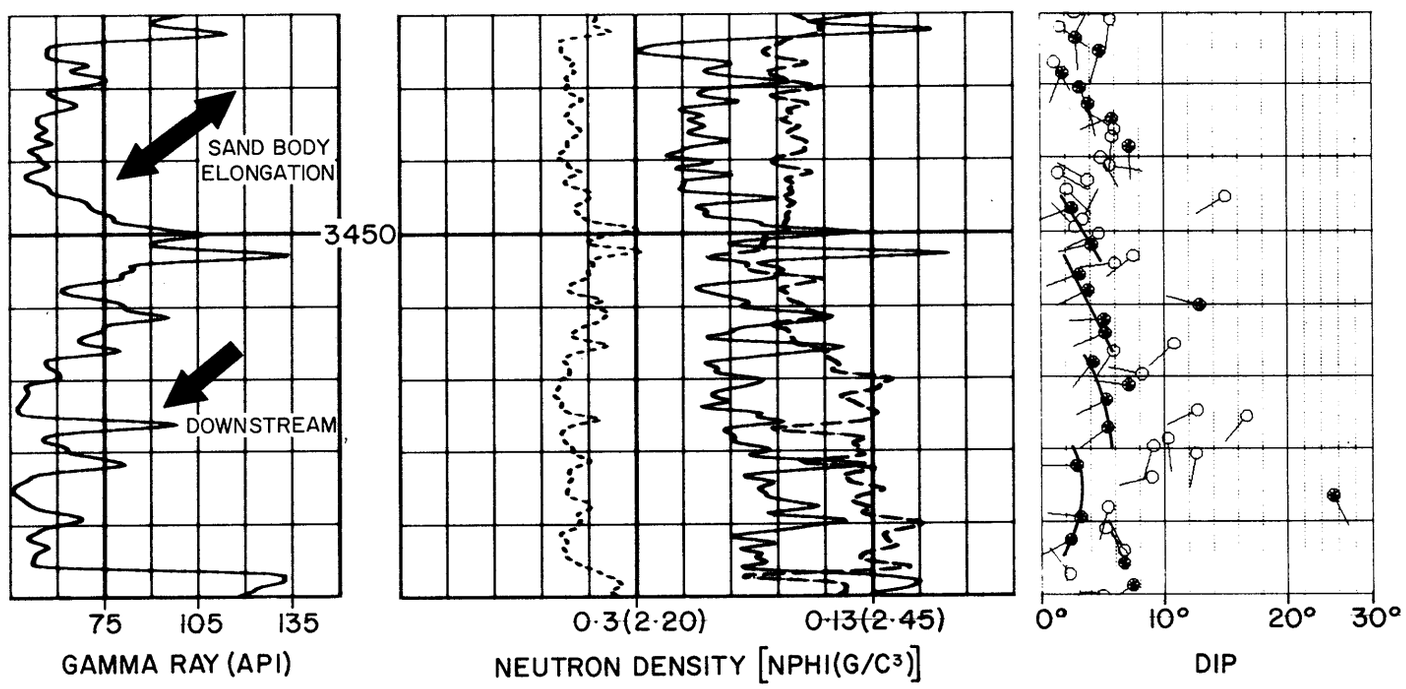
LATROBE GROUP OFFSHORE AND BARRIER BARS OVERLYING BARRIER ISLAND/BEACH STRAND LINE SYSTEM

FIGURE 6
A-5862

DIPMETER, GAMMA RAY LOG SHAPE AND POROSITY RELATIONSHIPS. SELENE-1



A. LATROBE GROUP TIDAL CREEK POINT BARS



B. LATROBE GROUP BRAIDED STREAM ALLUVIUM

FIGURE 7
A-5863

Figure 7B shows braided stream alluvium of the Latrobe Group penetrated near the base of Selene No. 1. The sands display a moderately-serrated series of bell shapes on the gamma-ray log which indicates a fining upward sequence. Dip magnitudes are generally low and have a fairly constant azimuth of southwest. This implies current flow to the southwest. Excellent porosity is indicated by the neutron-density combination.

Dipmeter Summary and Environmental Interpretation

Dipmeter data, when used with wireline log and lithological information has proved useful in environmental interpretation in Selene No. 1. The environmental history is as follows:

1) During the Campanian the Selene area had an alluvial environment dominated by braided steam deposition which flowed to the southwest.

2) Later in Campanian time, due to the beginnings of a marine transgression, the environment changed from a braided stream to a paludal swamp type of environment dominated by coal swamps which were dissected by tidal creeks and small tidal streams. These small streams emptied into lagoons located between the mainland and an extensive barrier island system. The barrier islands paralleled the coast in a northeast-southwesterly trend. Sediment supply was from the north. This environment continued into the Maastrichtian.

3) Later in Maastrichtian time the environment in the Selene area changed from the paludal swamp/tidal stream environment, described above, to lagoonal. The lagoonal environment was located between barrier islands and the mainland. These lagoonal sediments were overlain by the massive sands of a barrier island-beach strand line system which continued to parallel the coast in a west-northwest to east-southeast direction with sediment supply from the north. These environmental interpretations are further evidence of a continued marine transgression.

4) In latest Maastrichtian to perhaps Early Paleocene time, as the marine transgression continued, the environment again changed from the barrier island/beach strand line system to a near shore marine system in which sediments were deposited between offshore/barrier bars and barrier islands. By this time the source of sediment supply to the north was being rapidly eroded and inundated by the marine transgression. The trend of the shoreline was rapidly changing from a northwest-southeast orientation to a west-northwest to east-southeast orientation. This change in orientation is represented by the Top Latrobe Coarse Clastics, overlying the near shore marine/lagoonal deposits, and are offshore and barrier bars with a northeast-southwest depositional trend.

5) An unconformity separates the majority of the Latrobe Group from the formations of the condensed section at the top of the group. The Colquhoun, Gurnard and Flounder Formations represent intertidal, estaurine, lagoonal and barrier/dune deposits with sediment supply again from the north. These formations are separated by unconformities which represent unstable conditions due to the breakup of Antarctica and Australia.

6) The Latrobe Group overall from T.D. to 2848 metres represents a prograding, wave dominated, depositional system which was constrained by an overriding marine transgression. The result was a deltaic system that appears upside down sedimentologically.

PE902606

This is an enclosure indicator page.
The enclosure PE902606 is enclosed within the container PE902605 at this location in this document.

The enclosure PE902606 has the following characteristics:

ITEM_BARCODE	= PE902606
CONTAINER_BARCODE	= PE902605
NAME	= Operation Summary
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= REPORT
DESCRIPTION	= Operation Summary
REMARKS	=
DATE_CREATED	= 1/03/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE601308

This is an enclosure indicator page.
The enclosure PE601308 is enclosed within the container PE902605 at this location in this document.

The enclosure PE601308 has the following characteristics:

ITEM_BARCODE	= PE601308
CONTAINER_BARCODE	= PE902605
NAME	= Masterlog Geological Evaluation (enclosure from WCR) for Selene-1
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Masterlog geological evaluation
REMARKS	=
DATE_CREATED	= 5/02/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= GEOSERVICES
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL CO.

(Inserted by DNRE - Vic Govt Mines Dept)

PE601309

This is an enclosure indicator page.
The enclosure PE601309 is enclosed within the container PE902605 at this location in this document.

The enclosure PE601309 has the following characteristics:

ITEM_BARCODE	= PE601309
CONTAINER_BARCODE	= PE902605
NAME	= Lithologic Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Lithologic Log
REMARKS	=
DATE_CREATED	= 27/12/82
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE601312

This is an enclosure indicator page.
The enclosure PE601312 is enclosed within the container PE902605 at this location in this document.

The enclosure PE601312 has the following characteristics:

ITEM_BARCODE	= PE601312
CONTAINER_BARCODE	= PE902605
NAME	= Composite Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= COMPOSITE_LOG
DESCRIPTION	= Composite Log
REMARKS	=
DATE_CREATED	= 5/02/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE601310

This is an enclosure indicator page.
The enclosure PE601310 is enclosed within the container PE902605 at this location in this document.

The enclosure PE601310 has the following characteristics:

ITEM_BARCODE	= PE601310
CONTAINER_BARCODE	= PE902605
NAME	= Well Log Plot
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Well Log Plot
REMARKS	=
DATE_CREATED	= 28/04/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE601311

This is an enclosure indicator page.
The enclosure PE601311 is enclosed within the container PE902605 at this location in this document.

The enclosure PE601311 has the following characteristics:

ITEM_BARCODE	= PE601311
CONTAINER_BARCODE	= PE902605
NAME	= Global Interpretation
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Global Interpretation
REMARKS	=
DATE_CREATED	= 6/02/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE902607

This is an enclosure indicator page.
The enclosure PE902607 is enclosed within the container PE902605 at this location in this document.

The enclosure PE902607 has the following characteristics:

ITEM_BARCODE	= PE902607
CONTAINER_BARCODE	= PE902605
NAME	= Convential Core Analysis
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Convential Core Analysis
REMARKS	=
DATE_CREATED	= 1/02/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= Selene-1
CONTRACTOR	= Phillips Australian Oil Co
CLIENT_OP_CO	= Phillips Australian Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

PE906317

This is an enclosure indicator page.
The enclosure PE906317 is enclosed within the container PE902605 at this location in this document.

The enclosure PE906317 has the following characteristics:

ITEM_BARCODE	= PE906317
CONTAINER_BARCODE	= PE902605
NAME	= Time-Depth Curve
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time-Depth Curve (basic) for Selene-1
REMARKS	=
DATE_CREATED	= 28/02/83
DATE_RECEIVED	= 11/07/83
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)

PE900804

This is an enclosure indicator page.
The enclosure PE900804 is enclosed within the container PE902605 at this location in this document.

The enclosure PE900804 has the following characteristics:

ITEM_BARCODE	= PE900804
CONTAINER_BARCODE	= PE902605
NAME	= Planktonic Assemblages
BASIN	= GIPPSLAND
PERMIT	= VIC/P18
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Summary Planktonic Foraminiferal Biostratigraphy of Gippsland Basin (Enclosure 9)
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W795
WELL_NAME	= SELENE-1
CONTRACTOR	=
CLIENT_OP_CO	= PHILLIPS AUSTRALIAN OIL COMPANY

(Inserted by DNRE - Vic Govt Mines Dept)