WCR
BARRACOUTA-4
(W688)

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

2 encl

OIL and GAS DIVISION

WELL COMPLETION REPORT

BARRACOUTA-4

GIPPSLAND BASIN

VICTORIA CONFIDENTIAL

~~CARDED~~

CONFIDENTIAL

Cored

BARRACOUTA-4

CONTENTS

APPENDICES

ENCLOSURES

I Structure Map Top of M-1 Oil Sand

II Well Completion Log, Barracouta-4 ~~(to be forwarded later)~~

III Time Depth Curve, Barracouta-4 ✓

IV Sonic Calibration Curve, Barracouta-4 ✓

V Hewlett-Packard Pressure Records ✓ (ATTACHMENT)

VI Extended Service Well Report, Barracouta-4 ✓ (ATTACHMENT)

VII Structure Cross Section, P.asperopolus & M.diversus zones, ✓ Barracouta Field

ESSO STANDARD OIL (AUSTRALIA) LTD.

COMPLETION REPORT

I WELL DATA RECORD

Date May 1977

LOCATION

WELL NAME	STATE	PERMIT or LICENCE	GEOLOGICAL BASIN	FIELD
Barracouta-4	Victoria	Vic L/2	Gippsland	Barracouta

CO-ORDINATES				MAP PROJECTION	GEOGRAPHICAL DESCRIPTION
	Lat.	Long.	X Y		
Surface	38°17'20.789"S	147°42'03.184"E	561 294mE 5761 860mN	AMG Zone 55	1.57 miles ENE from Barracouta 'A' platform
Bottom Hole	Straight hole				

ELEVATIONS & DEPTHS

ELEVATIONS	WATER DEPTH	TOTAL DEPTH	
Ground Sea Level		M.D. 4783' KB	Avg.Angle Straight hole
KB 83'	153'	T.V.D.	
RT	PLUG BACK DEPTH	REASONS FOR P.B.	
Braden Head	350'	Abandonment	
Top Deck Platform			

DATES

MOVE IN	RIG UP	SPUDDED
27 March 1977	29 March 1977	30 March 1977
RIG DOWN COMPLETE	**RIG RELEASED**	**PROD.UNIT - Start Rigging Up**
27 April 1977	27 April 1977	
PROD.UNIT - Rig Down Complete	**I.P. ESTABLISHED**	
	None	

MISCELLANEOUS

OPERATOR	PERMITTEE or LICENCEE	ESSO INTEREST	OTHER INTEREST
Esso Australia Ltd.	Hematite/Esso	50%	Hematite 50%

CONTRACTOR	RIG NAME	EQUIPMENT TYPE
Australian Odeco Ltd.	Ocean Endeavour	Semi-submersible drilling vessel

TOTAL RIG DAYS	DRILLING AFE NO.	COMPLETION NO.	TYPE COMPLETION
30.9	115101		

LAHEE WELL CLASSIFICATION		
	Before Drilling	Stepout
	After Drilling	Confirmation well for N-1 gas and M-1 oil reservoirs

S.D. Giles
Geologist

WELL BARRACOUTA-4

II	INITIAL PRODUCTION TEST		NOT APPLICABLE		
Date	WELL COMPLETION AS: Oil Well _____		Gas Well _____	Dry Hole _____	
Choke size, inch			Calculated P.I.		
Length of Test			Calculated A.O.F.		
Oil, BPD			Perforations		
Water, BPD			Shut-In BHP		
Gas, MCFD			Flowing BHP		
Gas Liquids, BPD			Shut-In Tubing Press		
Gas-Oil Ratio			Flowing-Tubing Press		
Gravity, API			Flowing Temperature		

III	PERFORATING RECORD (Prod. test, Completion, DST, FIT)					
INTERVAL	HPF	TOTAL SHOTS	SERV. CO.	DIFF. PRESS.	PERFORATION FLUID	SIZE AND TYPE GUN

Engineer

IV CASING - LINER - TUBING RECORD

Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
Pile Joint	24"	670 #	-	CC	1	34.91	262.9
Cross Over	20"	129 #	X-52	JV-CC	1	44.42	307.3
Conductor Casing	20"	91 #	X-52	JV	7	304.24	611.6
Float Joint	20"	91 #	X-52	JV	1	45.23	656.8
Casing Hanger	13-3/8"	-	-	-	1	2.30	230.3
D.V. Collar	13-3/8"	-	-	Butt	1	3.30	233.6
Surface Casing	13-3/8"	54.5 #	K-55	Butt	72	2873.67	3107.3
Float Collar	13-3/8"	-	-	Butt	1	1.70	3109.0
Float Joint	13-3/8"	54.5 #	K-55	Butt	1	36.77	3145.7
Float Shoe	13-3/8"	-	-	Butt	1	2.00	3147.7

V CEMENT RECORD

String	20" Conductor Csg.		13-3/8" Surface Csg.		
Type of Cement	Aust. 'N' Neat 12% Gel	Aust. 'N' Neat 2% $CaCl_2$	Aust. 'N' Neat	Aust. 'N' Neat 12% Gel	
Number of FT^3	708	413	380	1796	
Average weight of slurry	12.1	15.6	15.6	12.1	
Cement Top	Seafloor		2200'		
Casing Tested with	500 psi		1500 psi		
Number of Centralizers	6		11		
Number of Scratchers	-		-		
Stage Collar etc.	-		Bypass Baffle-top of float collar Shut off Baffle-top of collar 2nd joint		
Remarks	-		-		

G.W. WEYBURY
Engineer

IV CASING - LINER - TUBING RECORD

Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
Setting Sleeve	10-3/4"	-	-	SFJ-P	1	0.85	2669.2
Crossover Sub.	10-3/4"	-	-	-	1	1.70	2670.9
Flapper Valve Ass	10-3/4"	-	-	-	1	1.45	2672.4
Hanger	10-3/4"	-	-	-	1	7.22	2679.6
Liner	10-3/4"	45.5	K-55	SFJ-P	39	1519.28	4198.8
Landing Collar	10-3/4"	-	-	SFJ-P	1	0.95	4199.8
Baffle Collar	10-3/4"	-	-	SFJ-P	1	1.12	4200.9
Liner	10-3/4"	45.5	K-55	SFJ-P	1	39.62	4240.5
Set Shoe	10-3/4"	-	-	SFJ-P	1	3.46	4244.0

V CEMENT RECORD

String	10-3/4" Liner		
Type of Cement	Aust. 'N' Neat 0.3% HR-4		
Number of FT^3	1357		
Average weight of slurry	15.6 ppg		
Cement Top	2670'		
Casing Tested with	1500 psi		
Number of Centralizers	-		
Number of Scratchers	-		
Stage Collar etc.	-		
Remarks	-		

G.W. WEYBURY
Engineer

VI SUBSURFACE COMPLETION EQUIPMENT

NOT APPLICABLE DATE COMPLETED ______

Schematic	Equipment Description	Length	Depth

NOT APPLICABLE

WELL BARRACOUTA-4

VII SAMPLES, CONVENTIONAL CORES, SW CORES

INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
			Conventional Cores		
710'-2000'	5 sets of washed and dried and 1 set of unwashed cuttings samples	30' intervals	4568-4595*	Core #1	19' (70%)
2000-2800'		20' intervals	4595-4636*	Core #2	21' (51%)
3200-4783'		10' intervals	4636-4669*	Core #3	22' (67%)
			4669-4703*	Core #4	34'(100%)
710-4783	One sealed set of unwashed composited cuttings samples	100' intervals	*depths adjusted to FDC log run		
			Sidewall Cores		
			3200- 929	CST #1	28 of 30
			3054- 758	CST #2	29 of 30
			4006-3220	CST #3	30 of 30
			4780-4250	CST #4	30 of 30

VIII WIRELINE LOGS AND SURVEYS (Incl. FIT)

Type & Scale	From To	Type & Scale	From To
ISF/Sonic; 2" & 5"		HDT; 10" monitor	
Run 1 (ISF/Sonic/GR)	2930'- 650' (GR to 140')	Run 1	4000'-3147'
Run 2	3194'-2500'	Run 2	4782'-4241'
Run 3	4020'-3147'	Velocity Survey	
Run 4	3930'-3147'	1 (26 levels)	3930'-2000'
Run 5	4229'-4040'	2 (10 levels)	4700'-3927'
Run 6	4777'-4241'	FIT #1	4635'
		FIT #2	4649'
FDC/CNL; 2" & 5"		FIT #3	4646'
Run 1 (FDC/GR)	3201'- 656'	RFT #1-16	4745'-4634'
Run 2	4026'-3147'	HRT	
Run 3	3935'-3148'	Run 1	3053'-1500'
Run 4	4230-3880'	Run 2	2130'- 300'
Run 5	4783-4241'	Run 3	3027'-1750'
		Run 4	4540'-2600'
		CBL	
		Run 1	3023'-2000'

S.D. Giles
Geologist

IX(a) STRAITIGRAPHIC TABLE

FORMATION/HORIZON	AGE	ZONE	DEPTH - KB (SUBSEA) FEET	
Seafloor			236	(153)
GIPPSLAND LIMESTONE	Pliocene-Recent	A	236-1343	(153-1260)
	Miocene	B	1343-2078	(1260-1995)
		C	2078-2400	(1995-2317)
		D_1	2400-2490	(2317-2407)
		D_2	2490-2707	(2407-2624)
		E_1	2707-3171	(2624-3088)
		E_2	3173-3193	(3088-3110)
		* F	3205-3247	(3122-3164)
		* H_2	3193-3205	(3110-3122)
		I_1	3247-3343	(3164-3260)
LAKES ENTRANCE FM	Oligocene	J_1/ P.tuberculatus	3343-3416	(3260-3333)
LATROBE GROUP	Eocene	M.N.asperus - U.M.diversus	3416-4783	(3333-4575)
Gurnard Formation	Eocene	M.N.asperus	3416-3452	(3333-3369)
Top Latrobe Coarse Clastics			3452	(3369)
Top N-1 Reservoir			3452	(3369)
N-1.1	Eocene	M.N.asperus	3452-3503	(3369-3420)
Top N-1.2			3503	(3420)
Gas Water Contact		L.N.asperus	3503-4251?	(3420-4168)
			3860	(3777)
		P.asperopolus	4251?-4631	(4168-4548)
Top M-1 Reservoir			4631	(4548)
		U.M.diversus	4631-4783	(4548-4700)
Present oil-water contact			4647	(4564)
Original oil-water contact			4658	(4575)

*Zones F and H_2 are inverted. This appears to be due to canyon-cutting and slumping within the Miocene channelling. See Pal. Rept. 1977/14 Appendix 7.

IX(b) DESCRIPTION OF LITHOLOGIC UNITS

Depth (feet, KB)	
236-710	No samples, returns to seafloor.
710-1790	Calcarenite, buff to medium grey, silt to fine-grained, friable to hard, silt and clay matrix, very calcareous, minor pyrite and glauconite. Moderate to abundant skeletal fragments of bryozoa, molluscs, occasional coral and common foraminifera.
1790-2010	Calcareous siltstone, medium to dark grey, friable to firm, silt and clay matrix, very calcareous, minor pyrite and glauconite. Common skeletal fragments of bryozoa and abundant foraminifera.
2010-2650	Calcarenite to calcareous siltstone, medium to dark grey, silt to very fine grained, soft to hard, clay matrix, very calcareous, minor pyrite and glauconite. Occasional skeletal fragments of bryozoa, common to abundant foraminifera.
2650-3100	Sandstone, buff, very fine to very coarse, very friable to loose, subrounded to rounded, poor sorting, very calcareous, minor glauconite. Poor porosity, no shows. Note: While drilling at 2951', lost circulation was experienced. No returns were made below 2800' sample depth to 3201' All descriptions through this interval are based on sidewall core descriptions.
3100-3343	Calcareous siltstone/claystone, light to medium grey, firm, very calcareous, glauconite absent to abundant, fossilifer ous (mainly planktonic foraminifera, with bryozoa and benthonic foraminifera).
3343-3416	Calcareous siltstone/claystone, buff to light grey, firm, very calcareous, moderately glauconitic, moderately pyritic, trace of quartz grains, loose, white, very fine to medium.
3416-3452	Siltstone, green to brown, firm, rarely slightly calcareous, abundantly glauconitic and pyritic, some quartz grains, fine to coarse, very weak to weak blue-white fluorescence in lower part.
3452-4055	Sandstone, with minor siltstone and coal. Sandstone, buff to light grey, fine to coarse, soft to unconsolidated, poorly to well sorted, subangular to subrounded, occasionally argillaceous, carbonaceous, micaceous. Generally good porosity. Rare dolomitic cement when sandstone becomes hard. Siltstone, dark brown, soft, micaceous and carbonaceous. Coal, black to dark brown, soft to firm, occasionally shaley, bleeding gas.
4055-4305	Coal and sandstone with minor siltstone. Coal, black, clean to silty, firm to brittle. Sandstone, buff to light grey, fine to coarse, as above. Siltstone, dark brown, soft, micaceous and carbonaceous.
4305-4783 T.D.	Sandstone with minor coal and siltstone. Siltstone and coal as above, sandstone as above except over the interval 4631'-4658' where it had strong bright yellow fluorescence with fast blue-white cut.

X. GEOLOGICAL AND GEOPHYSICAL ANALYSIS

A. PREDRILL

I. GEOPHYSICAL

Barracouta Field is a northeast-southwest trending faulted anticline. Two commercial reservoirs are present - the N-1 gas reservoir at the Latrobe unconformity and the intra-Latrobe M-1 oil reservoir. Based on several generations of seismic shooting and re-appraisal, the top of the N-1 Reservoir was predicted at the Barracouta-4 location at 3340 feet subsea. The crest of the underlying M-1 structure, offset some 1,000 feet to the south of the N-1 structural axis was predicted at this location at 4495 feet subsea.

II. GEOLOGICAL

The N-1 reservoir is divided into two units which can be correlated across the field. The N-1.1 and the N-1.2 both consist of good to excellent quality braided stream sands with interbedded coals and siltstones.

The M-1 reservoir was also deposited under fluviatile conditions as point-bar and braided stream sands with minor interbedded shale. The seal to the M-1 reservoir is a very continuous shale and coal sequence some 30 feet thick. The well was planned to be completed using subsea facilities as an M-1 oil producer.

B. POSTDRILL

I. GEOPHYSICAL

The top of the N-1 Reservoir was encountered at 3369 feet subsea, 29 feet low to prediction, due to minor variations in lag and conversion factor. The top of the M-1 reservoir was 53 feet low to prediction at 4548 feet subsea. The error was due to the VNMO prediction which was some 100 ft/sec slow. The slow velocity nose previously mapped from the north has proved incorrect, and its removal has caused the whole eastern end of the structure to be depressed.

II. GEOLOGICAL

While drilling the Gippsland Formation at 2951 feet, circulation and returns were lost. Drilling continued to 3201 feet with no returns, with hole losing about 60 barrels of mud per minute to the formation. Sidewall cores and wireline logs indicate the lithology over this section is a coarse-grained unconsolidated sandstone which was deposited in Miocene channels. Although this section has been observed in other wells on the field, lost circulation has not been encountered.

Between 3416 feet and 3452 feet, a tight glauconitic and pyritic sandy siltstone was described from cuttings and sidewall cores. Palynological dating and lithological correlations indicate that this interval represents Gurnard Formation, which is recognized for the first time on the structure. Re-examination of previous wells suggest the Gurnard Formation is, in fact, widespread at Barracouta.

The top of the N-1 Reservoir was encountered at 3369 feet subsea (3452 feet KB), 29 feet low to prediction. 408 feet of gross gas sands were intersected to a gas-water contact at 3777 feet subsea (3860 feet KB), and no movement of the contact due to production was observed. However, the contact was intersected in a poor-quality reservoir section.

The thick coal in the interval 4055-4116 feet KB created bad hole conditions and minor loss of circulation. As a result, it was not possible to run certain logs over the interval 4230 to 4000 feet KB.

The M-1 Reservoir was encountered at 4548 feet subsea (4631 feet KB), 53 feet low to prognosis, and the 16 feet of remaining net oil sand was considered to be insufficient to justify the proposed subsea completion and the well was plugged and abandoned . The oil-water contact had risen from 4575 feet subsea to 4566 feet subsea leaving a 9 feet residual oil zone. Further, the top of the reservoir was lower at Barracouta-4 than at Barracouta A-4, which will therefore be able to produce all the oil from the eastern end of the field. 96 feet of excellent quality sands were intersected in the M-1 section (4631-4735 feet KB), being divided into two intervals by a shale from 4658 feet to 4666 feet KB.

APPENDICES

1. Sample descriptions
2. Sidewall core descriptions
3. Core descriptions
4. (a) Formation interval tests
   (b) Repeat formation tests
5. Log analysis
6. Velocity survey
7. Foraminiferal sequence, Barracouta #4
8. Palynological analysis, Barracouta-4, Gippsland Basin

APPENDIX I

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
710-740	50	Skeletal limestone - unconsolidated fragments, bryozoans, planktonic and benthonic forams, branch coral
	50	Calcarenite - very fine to medium grain size, some glauconite inclusions, hard, trace cement cavings
740-770	80	Skeletal limestone - unconsolidated fragments, mainly bryozoa and branch coral, forams
	20	Calcarenite - very fine to fine grain size, minor glauconite, moderate sorting, hard
	Tr	Cement cavings
770-800	60	Skeletal limestone - unconsolidated fragments, as above
	40	Calcarenite - buff to light grey, very fine to fine grain size, subrounded, equant grains, moderate sorting, hard to friable, minor glauconite inclusions
	Tr	Cement cavings
800-830	60	Calcarenite - buff to light grey, very fine to fine grain size, subrounded, equant grains, moderate sorting, silt/clay cement/matrix, hard, minor glauconite inclusions
	40	Skeletal limestone - unconsolidated fragemnts, mainly coral and bryozoa, some forams
830-860	70	Calcarenite - as above, very calcareous
	30	Skeletal limestone - as above
	Tr	Cement cavings
860-890	70	Calcarenite - as above
	30	Skeletal limestone - as above, some fragments pyritised
890-920	70	Calcarenite - buff to light grey, very fine to fine grained, subrounded equant grains, silt/clay matrix/cement, very calcareous hard, glauconite inclusion
	30	Skeletal fragments - mainly bryozoa and branch coral, some forams, some pyritised fragments up to 2mm
	Tr	Cement cavings
920-950	80	Calcarenite - as above
	20	Skeletal fragments - as above
	Tr	Cement cavings
950-980	85	Calcarenite - as above
	15	Skeletal fragments - as above, mainly bryozoa
	Tr	Cement cavings.
980-1010	85	Calcarenite - buff, very fine to fine, subrounded equant grains, silt/clay matrix/cement, hard to friable, very calcareous, minor glauconite inclusions
	15	Skeletal fragments - unconsolidated, mainly bryozoa and coral, minor forams and shell fragments
	Tr	Pyrite
1010-1040	90	Calcarenite - as above
	10	Skeletal fragments - as above
1040-1070	90	Calcarenite - as above, tends to grade to Calcareous Siltstone
	10	Skeletal limestone - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
1070-1100	75	Calcarenite - buff, very fine to fine, subangular to subrounded equant grains, silt/clay matrix/cement, very calcareous, hard, minor glauconite inclusions
	25	Skeletal limestone - unconsolidated fragments, mainly bryozoa and coral, some forams
1100-1130	80	Calcarenite - as above
	20	Skeletal limestone - as above
1130-1160	85	Calcarenite - as above, grades to calcareous siltstone in parts.
	15	Skeletal limestone - as above
	Tr	Pyrite
1160-1190	90	Calcarenite - buff, very fine to fine, subangular to subrounded equant grains, silt/clay matrix/cement, hard to friable, very calcareous, glauconite inclusions, minor pyrite
	10	Skeletal limestone - unconsolidated fragments, mainly bryozoa and coral, some forams
1190-1220	90	Calcarenite - as above, silt to fine grain size, poor to moderate sorting
	10	Skeletal limestone - as above
1220-1250	90	Calcarenite - as above
	10	Skeletal limestone - as above
1250-1280	100	Calcarenite - buff to light grey, silt to fine, subangular to subrounded equant grains, silt/clay matrix/cement, very calcareous minor glauconite, moderate sorting
	Tr	Skeletal fragments - mainly bryozoa, coral, some forams
1280-1310	100	Calcarenite - as above, grades in part to calcareous siltstone
	Tr	Skeletal fragments - as above
1310-1340	90	Calcarenite - as above
	10	Skeletal fragments - as above
1340-1370	100	Calcarenite - buff to light grey, silt to fine subangular to subrounded equant grains, silt/clay matrix/cement, hard to friable, very calcareous, glauconite inclusions
	Tr	Skeletal fragments - mainly bryozoa, minor forams, shell fragments
1370-1400	90	Calcarenite - as above, leached grains infilled by glauconite
	10	Skeletal fragments - as above
1400-1430	100	Calcarenite - as above, 5% medium to dark grey
	Tr	Skeletal fragments - as above
1430-1460	90	Calcarenite - buff to light grey, some medium to dark grey, silt to fine subangular to subrounded equant grains, silt/clay matrix /cement, hard to friable, very calcareous, glauconitic inclusions
	10	Skeletal fragments - mainly bryozoa, some forams
1460-1490	90	Calcarenite - as above, glauconite replaces some grains
	10	Skeletal fragments - as above
1490-1520	100	Calcarenite - as above
	Tr	Skeletal fragments - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
1520-1550	90	Calcarenite - buff to light grey, some medium grey, silt to fine subangular to subrounded equant grains, mainly very fine grain size, hard to semi friable, very calcareous, minor glauconite and pyrite
	10	Skeletal fragments - mainly bryozoa, some forams and shell fragments, up to 1.5mm
1550-1580	80	Calcarenite - as above
	20	Skeletal fragments - mainly bryozoa, as above
		Depth Correction - 71.42'. Error in pipe tally made by driller on first tower.
1520-1550 (a) D.C.	90	Calcarenite - buff to light grey, some medium grey, silt to fine subangular to subrounded equant grains, mainly very fine grain size, hard to semi friable, silt/clay matrix, minor glauconite, very calcareous
	10	Skeletal fragments - buff, mainly bryozoa, some forams and shell fragments
1550-1580 (b) D.C.	90	Calcarenite - as above, grades in part to calcareous siltstone
	10	Skeletal fragments - as above
1580-1610	85	Calcarenite - as above
	15	Skeletal fragments - as above
1610-1640	90	Calcarenite - buff to light grey with some grains medium grey, silt to fine subangular to subrounded equant grains, mainly very fine, moderate sorting, silt/clay matrix/cement, hard to friable, minor pyrite and glauconite, very calcareous
	10	Skeletal fragments - buff, mainly bryozoa, some forams and shell fragments
	Tr	Quartz - individual grains, medium to very coarse, angular, clear
1640-1670	90	Calcarenite - as above, buff to medium grey
	10	Skeletal fragments - as above
		NOTE: Really a skeletal calcarenite - very coarse skeletal fragments set in a very fine calcarenite matrix
1670-1700	90	Calcarenite - as above, saccharoidal texture, no effective porosity or permeability
	10	Skeletal fragments - as above
1700-1794	90	Calcarenite - as above
	10	Skeletal limestone - as above
1794-1824	90	Calcareous siltstone - graded from calcarenite above, medium grey, silt to very fine subangular to subrounded equant grains, fair sorting, silt/clay matrix, hard to friable, minor pyrite and glauconite, very calcareous
	10	Skeletal fragments - buff to cream, mainly bryozoa, some forams
1824-1854	90	Calcareous siltstone - as above
	10	Skeletal fragments - bryozoa and forams
1854-1884	90	Calcareous siltstone - as above, firm to semi friable
	10	Skeletal fragments - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
1899	-	C.O. Pump slug. Run TOTCO. Tension anchors and pull rig over hole. 0.75° hole deviation. Trip Gas: 0 units. Strap pipe as tripped to 20" shoe DEPTH CORRECTION: + 94'
1880-1910	90	Calcareous siltstone - medium to dark grey, silt to very fine subangular to subrounded equant grains, fair sorting, silt/clay matrix, firm to semi friable, very calcareous
	10	Skeletal fragments - buff to cream, bryozoa and forams
1910-1940	100	Calcareous siltstone - as above, grades in part to buff calcarenite
	Tr	Skeletal fragments - as above
		2.4.77
1940-1970	100	Calcareous siltstone - medium grey, silt to very fine, subangular to subrounded equant grains, silt/clay matrix, firm to semi friable, minor glauconite, very calcareous, poor sorting
	Tr	Skeletal fragments - buff to cream, bryozoa and forams
1970-2000	60	Calcareous siltstone - as above
	40	Calcarenite - buff to light grey, silt to fine subangular to subrounded equant grains, silt/clay matrix, hard to friable, minor glauconite, poor sorting, very calcareous
	Tr	Skeletal fragments - as above
2000-2020	60	Calcareous siltstone - as above
	40	Calcarenite - as above, minor pyrite
	Tr	Skeletal fragments - as above
2020-2040	70	Calcareous siltstone - medium grey, silt to very fine subangular to subrounded equant grains, silt/clay matrix, firm to semi friable, some soft, poor sorting, very calcareous, minor glauconite and pyrite
	30	Calcarenite - buff to light grey, silt to fine subangular to subrounded equant grains, silt/clay matrix/cement, hard to semi friable, poor sorting, very calcareous, minor glauconite and pyrite
	Tr	Skeletal fragments - bryozoa and forams
2040-2060	70	Calcareous siltstone - as above
	30	Calcarenite - as above
	Tr	Skeletal fragments - as above
2060-2080	60	Calcareous siltstone - as above
	40	Calcarenite - as above
	Tr	Skeletal fragments - as above
2080-2100	80	Calcareous siltstone - medium to dark grey, silt to very fine subangular to subrounded equant grains, silt/clay matrix, firm, some soft, poorly sorted, very calcareous, minor glauconite and pyrite
	20	Calcarenite - buff to light grey, silt to fine subangular to subrounded equant grains, silt/clay matrix/cement, hard to semi friable, poorly sorted, very calcareous, minor glauconite and pyrite
	Tr	Skeletal fragments - buff to cream, bryozoa and forams
2100-2120	90	Calcareous siltstone - as above
	10	Calcarenite - as above
	Tr	Skeletal fragments - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
2120-2140	70	Calcarenite - buff to light grey, silt to fine subangular to subrounded equant grains, hard, silt/clay matrix/cement, very calcareous, minor glauconite and pyrite
	30	Calcareous siltstone - medium grey, silt to very fine subangular to subrounded equant grains, firm to slightly soft, silt/clay matrix, very calcareous
	Tr	Skeletal fragments - buff to cream, bryozoa and forams
2140-2160	90	Calcarenite - as above
	10	Calcareous siltstone - as above
	Tr	Skeletal fragments - as above
2160-2180	100	Calcarenite - as above
	Tr	Calcareous siltstone - as above
	Tr	Skeletal fragments - as above
2180-2200	100	Calcarenite - buff to light grey, silt to medium grained, subangular to subrounded equant grains, mainly very fine, hard to semi friable, silt/clay matrix, very calcareous, glauconite and pyrite, no effective porosity and permeability
	Tr	Calcareous siltstone - medium to dark grey, silt to very fine, subangular to subrounded equant grains, firm to soft, silt/clay matrix, very calcareous, minor glauconite and pyrite
	Tr	Skeletal fragments - buff to cream, bryozoa and forams
2200-2220	80	Calcarenite - as above, tends to be softer
	20	Calcareous siltstone - as above
	Tr	Skeletal fragments - as above
2220-2240	70	Calcareous siltstone - as above
	30	Calcarenite - as above, firm to slightly soft
	Tr	Skeletal fragments - as above
2240-2260	100	Calcareous siltstone - medium to dark grey, silt/very fine subangular to subrounded equant grains, firm to soft, clay matrix/cement , minor glauconite and pyrite, very calcareous, poorly sorted, some grades to very fine to fine calcarenite
	Tr	Skeletal fragments - buff to cream, bryozoa and forams
2260-2280	100	Calcareous siltstone - as above, grades in clay end to marl
	Tr	Skeletal fragments - as above
2280-2300	100	Calcareous siltstone - as above
	Tr	Skeletal fragments - as above
	Tr	Rare quartz grain - coarse to very coarse, angular, clear
2300-2320	100	Calcareous siltstone - medium to dark grey, soft to very fine, subangular to subrounded equant grains, clay matrix, firm to soft, fair sorting, very calcareous, minor glauconite
	Tr	Skeletal fragments - buff to light grey, bryozoa and forams
2320-2340	100	Calcareous siltstone - as above, minor fraction grades to very fine calcarenite
	Tr	Skeletal fragments - as above, rare quartz grains
2340-2360	100	Calcareous siltstone - as above, grading to calcarenite
	Tr	Skeletal fragments - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
2360-2380	100	Calcareous siltstone - medium grey, very fine to silt, subangular to subrounded equant grains, clay matrix, firm to soft, minor glauconite, grades in part to calcarenite, very calcareous
	Tr	Skeletal fragments - buff to light grey, bryozoa and forams, rare quartz grains
2380-2400	100	Calcareous siltstone - as above
	Tr	Skeletal fragments - as above
2400-2420	100	Calcareous siltstone/calcarenite - silt to very fine, as above
	Tr	Skeletal fragments - as above; Rare
		Quartz grains - medium to very coarse, angular, clear
2420-2440	100	Calcarenite - medium grey, silt to very fine, subangular to subrounded equant grains, clay matrix, hard to semi friable, graded from calcareous siltstone above, glauconite, pyrite, very calcareous
	Tr	Skeletal fragments - as above
2440-2460	100	Calcarenite - as above
	Tr	Skeletal fragments - mainly forams, some bryozoa
2460-2480	100	Calcarenite - as above
	Tr	Skeletal fragments - as above
2480-2500	100	Calcarenite - as above
	Tr	Skeletal fragments - as above
2500-2520	100	Calcarenite - medium grey, silt to very fine, subangular to subrounded equant grains, clay matrix, firm to soft, very calcareous, poor sorting, minor glauconite and pyrite
	Tr	Skeletal fragments - buff to light grey, mainly forams, some bryozoa; rare quartz grains - medium to very coarse, angular, clear to translucent.
2520-2540	100	Calcarenite - medium grey, silt to very fine subangular to subrounded equant grains, clay matrix, firm to soft, very calcareous, glauconite and pyrite inclusions, poor sorting
	Tr	Skeletal fragments - bryozoa and forams; rare quartz grains - medium to very coarse, angular, equant, clear
2540-2560	100	Calcarenite - as above
	Tr	Skeletal fragments - as above
1560-1580	100	Calcarenite - as above
	Tr	Skeletal fragments - as above
2580-2600	100	Calcarenite - as above
	Tr	Skeletal fragments - as above; rare quartz grains
		2655' - Drilling break 180 → 850; stop and check for flow - no flow. Drill ahead.

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
2600-2620	100	Calcarenite - medium to grey, silt to medium subangular to subrounded equant grains, clay matrix, firm to semi friable, very calcareous, minor glauconite and pyrite, poor sorting
	Tr	Skeletal fragments - buff to light grey, forams, bryozoa
	Tr	Quartz grains - medium to very coarse, subrounded, equant grains, milky
2620-2640	100	Calcarenite - as above
	Tr	Skeletal fragments and quartz - as above
2640-2660	70	Calcarenite - as above, buff to cream, some medium grey, glauconitic
	30	Sandstone - loose quartz grains, medium to very coarse, some very pebbly, subrounded to rounded equant grains, clear to milky, no show, very high porosity and permeability
	Tr	Skeletal fragments - as above
2660-2680	60	Calcarenite - buff to cream, fine to medium subangular equant grains, hard to friable, very calcareous
	40	Sandstone - loose quartz grains, as above, subangular to rounded
	Tr	Skeletal fragments - as above
2680-2700	75	Sandstone - all loose quartz grains, as above, generally well rounded, no show
	25	Calcarenite - as above
2700-2720	60	Sandstone - as above
	40	Calcarenite - as above
	Tr	Skeletal fragments - as above
2720-2740	50	Sandstone - loose quartz grains, medium to very coarse, subangular to well rounded, equant grains, clear to milky, quartz grains held in calcarenite matrix
	50	Calcarenite - buff to cream, very fine to medium grained, vuggy porosity, firm to friable, very calcareous, glauconite infills vugs
2740-2760	70	Calcarenite - as above
	30	Sandstone - loose quartz, as above
2760-2780	60	Calcarenite - as above
	40	Sandstone - loose quartz, as above
	Tr	Skeletal debris
2780-2800	70	Calcarenite - buff to cream, very fine to medium subangular to subrounded equant grains - commonly leached giving vuggy porosity firm to friable, very calcareous, glauconite infills vugs
	30	Sandstone - loose quartz, medium to very coarse, subangular to well rounded, generally well rounded, equant grains, clear to milky, no show
		Lost circulation, no returns at 2952'. 100' samples in hole - 1100 hrs, 2.4.77. Lost 290 bbls mud, kept pumping 80 SPM of seawater to keep fluid level, about 40' below RT. Ran ISF-Sonic-GR at 657-2939', GR to 147' (includes +7' Depth Correction, 3.4.77). Tied Barracouta-4 with Barracouta-1, 4-15' lower than 1. Drilling ahead at 0330, 3.4.77 with seawater, WOB 2000-5000lbs, continued lost circulation, no returns. Pump strokes 240 SPM (2 pumps) 30 bbls/min lost to formation.

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
		Bit dropped about 38' at 2952 before hitting bottom. Harder formation at about 3005' - ROP 50'/hr. Drilled to 3200' without returns, Added about 1000 bbls mud. Adding seawater at 60 SPM through kill line whilst logging.
		Sample from bit:
	75	Quartz - loose grains, very fine to very coarse, subrounded to rounded, clear to milky
	25	Marl - buff, clay grain size, very calcareous
3200-3220	30	Siltstone - light grey, firm, very calcareous, slightly sandy
	40	Quartz sand - fine to very coarse, clear to frosted, subangular to subrounded
	20	Glauconite - dark green, peellets, fine to very coarse
	10	Pyrite aggregates
3225'		Circulation BU, Run PIT - pressure to 385 psi, drop to 345 psi after 30 mins. BOB 0540 hrs, 8.4.77. Drill at 20-25M WOB 115 RPM, approx. 50'/hr.
3225-3230'	100	Marl - light grey, gumbo, very calcareous, abundant glauconite, pellets, dark green, very fossiliferous (forams), common quartz, fine to coarse, subrounded to rounded, trace pyrite aggregates
3230-3240'	80	Marl - as above
	20	Siltstone - light grey, soft, glauconite, very calcareous, slightly sandy
3240-3250	80	Marl - as above
	20	Siltstone - as above
3250-3260	100	Marl - as above
	Tr	Siltstone - as above
3260-3270	100	Marl - as above
	Tr	Siltstone - as above
3270-3280	30	Marl - as above) Sample washed more than before
	70	Siltstone - as above)
3280-3290	100	Marl - as above
	Tr	Siltstone - as above
3290-3300	60	Marl - as above
	40	Siltstone - as above
3300-3310	-	Sample description missing
3310-3320	100	Marl - light grey, very sticky, silty, abundant glauconite
	Tr	Quartz - medium, subangular to subrounded, translucent
	Tr	Fossils - forams
	Tr	Siltstone - calcareous, light grey to light brown
3320-3330	100	Marl - as above, abundant glauconite
	Tr	Quartz, siltstone, forams - as above
3330-3340	100	Marl - as above, abundant glauconite
	Tr	Quartz, siltstone, forams - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
3340-3350	100	Marl - as above, glauconite abundant
	Tr	Quartz, siltstone, forams - as above
3350-3360	100	Marl - light grey to brown, sticky
	Tr	Siltstone - light brown, soft to firm
	Tr	Glauconite
3360-3370	100	Marl - as above, very fossiliferous
	Tr	Siltstone - as above
	Tr	Glauconite
3370-3380	100	Marl - as above
	Tr	Siltstone - as above
	Tr	Glauconite
3380-3390	100	Marl - as above
	Tr	Siltstone - as above
	Tr	Glauconite
3390-3400	100	Marl - as above
	Tr	Siltstone - as above
	Tr	Glauconite
3400-3410	100	Marl - light grey, gumbo, slightly sandy, very calcareous, trace glauconite
	Tr	Sandstone - fine, soft, light brown, calcareous (mineral fluorescence) poor porosity
	Tr	Siltstone - light grey, soft, fossiliferous
3410-3420	100	Marl - as above
	Tr	Sandstone - as above
	Tr	Siltstone - as above
3420-3430	100	Marl - as above, abundant glauconite, very dark green to black
	Tr	Sandstone - as above
	Tr	Siltstone - as above
3430-3440	50	Quartz - clear, milky, pale yellow, subangular to well rounded, equant, poorly sorted, medium to coarse and very coarse, some frosted
	40	Marl - light brown to cream, containing abundant glauconite. Probably matrix to quartz grains
	10	Loose glauconite with pyrite.
	Tr	Forams
		Mineral fluorescence only
		Bottom Sample:
3446'	55	Quartz - as above
	30	Marl - as above
	10	Glauconite
	5	Pyrite
	Tr	Forams
3440-3450	70	Quartz - clear, translucent, milky, subangular to well rounded, equant, moderate sorting, mainly coarse to very coarse, some medium
	30	Marl - very soft and sticky, light brown to cream, containing glauconite and pyrite. No shows.

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
3450-3460	100	Quartz - as above, clean, no shows
	Tr	Marl - as above
3460-3470	90	Quartz - clear, translucent, milky, honey yellow, well sorted (medium) coarse and very coarse grained, mainly well rounded, no shows, unconsolidated
	10	Siltstone - dark brown to grey, very micaceous, carb., firm
3470-3480	95	Quartz - very coarse, well rounded, equant grains, trace pyrite and glauconite associated
	5	Coal - grading to very carbonaceous siltstone, micaceous
3480-3490	50	Coal - grading to siltstone, brown to black, very carbonaceous, micaceous. Bleeding gas
	50	Quartz - as above
3490-3500	80	Coal - bleeding gas
	20	Quartz - clear to milky, well rounded, equant grains, medium to very coarse
	Tr	Glauconite, pyrite
3500-3510	100	Quartz - clear, translucent, milky, very well sorted, coarse to very coarse grained, well rounded, clean; rare brown coating on grains, rare glauconite, pyrite
	Tr	Coal
3510-3520	100	Quartz - as above
3520-3530	100	Quartz - as above
3530-3540	100	Quartz - clear, translucent to pale yellow-brown, very coarse to granular, subangular to mainly well rounded, equant grains
3540-3550	100	Quartz - as above, mainly light honey colour
3550-3560	95	Quartz - as above
	5	Coal
3560-3570	95	Quartz - with dolomite cement, clear, translucent, milky, poorly sorted, medium to coarse to very coarse to gritty grains, subangular to rounded, equant
	5	Coal
		Trip for new bit
		Circulating at 3573'
3573'	95	Sandstone - loose quartz, as above, with common dolomite cement
	5	Coal - as above
3573-3580	100	Quartz sand - clear to translucent, occasional tan grains, medium to granular, many grains fractured, (subangular) to rounded, loose, trace dolomite cement
	Tr	Coal - black, shaley
	Tr	Siltstone - dark brown, carbonaceous, soft
3580-3590	100	Quartz sand - medium to granular grains, 2-5% dolomitic cement
	Tr	Coal - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
3590-3600	100	Quartz sand - medium to coarse, trace fluorescence, br. yellow and blue white cut, trace dolomite cement, very well sorted, rounded
3600-3610	100	Quartz sand and Sandstone - fine to medium to coarse, abundant dolomite cement (lightly cemented only), 80% sample sandstone, well sorted , generally fine to medium, subangular, trace fluorescence and cut - as above (1-2 grains only).
3610-3620	100	Quartz sand (+ Sandstone) - fine to medium, trace dolomite cement, fair to well sorted, subangular, no shows
	Tr	Coal - black, brittle
3620-3630	60	Quartz sand - as above, no shows
	40	Sandstone - as above, hard, dolomite cement, no shows
	Tr	Coal - black, brittle, slightly pyritic
3630-3640	80	Quartz sand - as above (fine to medium)
	20	Sandstone - as above (fine to medium)
	Tr	Coal - as above
3640-3650	100	Sand - white, fine to medium, loose, very well sorted, rounded.
	Tr	Sandstone - white, fine to medium, hard, dolomite cement, grains well sorted, subangular to subrounded, poor porosity, rare yellow fluorescence and blue-white cut
	Tr	Coal - as above
3650-3660	100	Sand - white, very fine to fine to medium, loose, well sorted, subangular to rounded, no shows
	Tr	Sandstone - white, fine to medium, hard, dolomite cement, as above, no shows
3660-3670	100	Sand - white, fine to medium, loose, well sorted, subangular to subrounded to rounded, no shows
3670-3680	100	Sand - fine to medium, and coarse to granular (70/30), loose, bimodal but well sorted, subangular to subrounded, no shows, white
3680-3690	100	Sand - fine to medium to coarse, and very coarse to granular (50/50), as above
	Tr	Coal - black, brittle, slightly pyritic
3690-3700	100	Sand - fine to medium to coarse, as above
3700-3710	100	Quartz sand - white, fine to medium to coarse, loose, well sorted, trace dolomitic sandstone, subangular to subrounded, excellent porosity, no shows
3710-3720	100	Quartz sand - white, fine to medium to coarse, loose, very well sorted, subangular to rounded, excellent porosity, no shows
3720-3730	100	Quartz sand - white, fine to medium to coarse, loose, well sorted, subangular to rounded, excellent porosity, no shows
3730-3740	100	Quartz sand - white, fine to medium to coarse, loose, well sorted, subangular to rounded, excellent porosity, no shows
3740-3750	100	Quartz sand - white, fine to medium to coarse, loose, very well sorted, subangular to rounded, excellent porosity, no shows

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
3750-3760	100	Quartz sand - white, fine to medium-(coarse), loose, well sorted, subangular to rounded, excellent porosity, no shows
3760-3770	100	Quartz sand - white, fine to medium-(coarse), loose, well sorted, subangular to rounded, excellent porosity, no shows
3770-3780	100	Quartz sand - white, fine to medium-(coarse), loose, well sorted, subangular to subrounded, excellent porosity, no shows
3780-3790	100	Quartz sand - clear, translucent, medium to very coarse, loose, subangular to well rounded, equant, excellent porosity, some grain aggregates with dolomite cement
3790-3800	100	Quartz sand - white, fine to medium to coarse, loose, subangular to rounded, fairly sorted, trace dolomite cement
3800-3810	100	Quartz sand - white, medium to granular, loose, subangular to rounded, poor to fair sorting, trace dolomite cement
	Hvy Tr	Siltstone - very carbonaceous, soft, very micaceous, sandy → coal, black, brittle
3810-3820	100	Quartz sand - medium to very coarse, loose, subrounded to rounded, equant, trace dolomite cement
3820-3830	100	Quartz sand - clear to translucent, coarse to gritty, mainly subangular to subrounded, some well rounded, equant, excellent porosity, trace dolomite, no shows
3830-3840	70	Quartz sand - medium to granular, subangular to subrounded, fairly sorted, excellent porosity, no shows
	30	Siltstone - black to very dark brown, very carbonaceous, laminated, soft to firm grading to coal, black, silty - bleeding gas, trace fluorescence from scattered vitrinite
3840-3850	80	Siltstone - carbonaceous → coal, as above
	20	Quartz sand - medium to granular, as above
3850-3860	90	Quartz sand - medium to granular, as above
	10	Siltstone - carbonaceous → coal, as above
	Tr	Siltstone - medium brown, slightly carbonaceous, micaceous, soft
3860-3870	80	Quartz sand - clear, translucent, milky, medium-coarse and very coarse, subangular to subrounded, equant, well sorted, no shows excellent porosity
	20	Siltstone - brown to black, very micaceous, bleeding gas - grading to coal
3870-3880	100	Quartz sand - clear to translucent, occasionally pink, medium to granular (coarse), subangular to subrounded, fairly sorted, trace dolomitic cement, no shows, excellent porosity
	Hvy Tr	Siltstone/Coal - as above
3880-3890	100	Quartz sand - medium to coarse to granular, as above
	Tr	Siltstone/Coal - as above
3890-3900	100	Quartz sand - medium to coarse, to very coarse, as above, trace dolomitic cement
3900-3910	100	Siltstone - dark brown, soft, very carbonaceous → coal, brown to black, very silty
	Tr	Quartz sand - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
3910-3920	70	Quartz sand - medium to coarse, as above
	30	Siltstone → coal (more coal) - as above
3920-3930	90	Quartz sand - medium to coarse, white, clear to translucent, well sorted, subangular to rounded, loose, excellent porosity, no shows
	10	Siltstone/Coal - coal, black, clean to silty, brittle
3930-3940	100	Quartz sand - medium to coarse to granular, white (clear to translucent), fairly sorted, subangular to subrounded, loose, excellent porosity, no shows, trace dolomite
		Thin coal at 3945' (3 units).
3940-3950	100	Quartz sand - white, medium to very coarse, clear to translucent, well sorted, subangular to subrounded, loose, excellent porosity, no shows, trace dolomite
3950-3960	100	Quartz sand - white, medium to very coarse, clear to translucent, well sorted, subangular to subrounded, loose, excellent porosity, no shows, trace dolomite
3960-3970	100	Quartz sand - medium to very coarse, as above
	Tr	Coal
3970-3980	100	Quartzose Sandstone - loose, medium to very coarse grained, as above, no shows
	Tr	Coal
3980-3990	100	Quartz sand - white, medium to very coarse, loose, no shows
	Tr	Coal
3990-400	100	Quartz sand - as above
	Tr	Coal and Siltstone
		Coal at 4008'
4000-4010	100	Quartz sand - as above
	Tr	Coal and Siltstone - as above
4010-4020	90	Coal - carbonaceous siltstone
	10	Quartz sand - as above
4020-4030	90	Quartz sand - as above
	10	Coal - carbonaceous siltstone, as above
4030-4040	90	Quartz sand - white, medium to very coarse, loose, subangular to subrounded, well sorted, loose, excellent porosity, no shows,
	10	Coal - carbonaceous siltstone, dark brown to black, soft, very carbonaceous
4040-4050	95	Quartz sand - as above
	5	Coal - carbonaceous siltstone, as above
4050-4060	100	Coal - carbonaceous siltstone, darb brown to black, micaceous, soft
4060-4070	100	Coal
4070-4080	100	Coal

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
4750-4760	100	Quartz sand - as above, medium to very coarse (medium to coarse).
	Tr	Coal, pyrite and siltstone
4760-4770	95	Quartz sand - as above, medium to very coarse (medium to coarse).
	5	Coal - black, bright, generally clean
	Tr	Pyrite, siltstone
	Tr	Claystome - white, clean, soft to firm
4770-4780	95	Quartz sand - as above, medium to granular (coarse to very coarse).
	5	Coal
	Tr	Pyrite, siltstone and claystone
4780-4783	95	Quartz sand - as above, medium to granular (very coarse)
	5	Coal
	Tr	Pyrite, siltstone and claystone
		T.D. POH to log.

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
4520-4530	100	Quartz sand - white, medium to granular (very coarse), loose, angular to subrounded, fairly sorted, excellent porosity, no shows
	Tr	Coal - black, brittle, as above
	Tr	Siltstone - brown, slightly carbonaceous, slightly laminated, soft to firm, as above
	Tr.	Claystone - white to cream, soft, clean, non-calcareous
4530-4540	100	Quartz sand - white, medium to granular (very coarse), as above, grains fractured
	Tr	Coal - as above
	Tr	Siltstone - as above
	Tr	Claystone - as above
4540-4550	100	Quartz sand - as above
	Tr	Coal - as above
	Hvy Tr	Siltstone - as above
4550-4560	95	Quartz sand - as above
	5	Coal - as above
	Tr	Siltstone - as above
4560-4570	90	Quartz sand - as above
	10	Coal - as above
	Tr	Sandstone - buff to brown, very fine, dolomitic, hard, tight, no shows
	Tr	Siltstone - as above
	Tr	Claystone - white to buff, soft
		POH, cut cores 1-4, 4566-4702'
4702-4710	100	Quartz sand - white, medium to coarse, clean, loose, well sorted, angular to subrounded, excellent porosity, rare single grains with good yellow fluorescence, instant milky blue/white cut.
	Tr	Siltstone - light brown, slightly carbonaceous, slightly micaceous, soft to firm, platy fractured.? cavings
	Tr	Coal - black
	Tr	Dolomitic sandstone - very fine, buff, very hard, tight, no shows
4710-4720	100	Quartz sand - as above, very rare fluorescence
	Tr	Siltstone, coal and dolomitic sandstone - as above
4720-4730	80	Quartz sand - as above, no fluorescence, no shows
	20	Coal - black, clean to shaley
4730-4740	60	Quartz sand - white, medium to very coarse (coarse), clean, loose, moderately sorted, angular to subrounded (fractured grains), trace pyritic cement, excellent porosity, no shows
	40	Coal - black, bright to dull, clean to shaley and slightly pyritic
	Tr	Siltstone - light brown, slightly carbonaceous, slightly micaceous, firm
4740-4750	90	Quartz sand - as above
	10	Coal - as above
	Tr	White mica
	Tr	Siltstone - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
4380-4390	100	Quartz sand - as above
4390-4400	100	Quartz sand - white, medium to granular (coarse to very coarse), loose, angular to subrounded, fairly sorted, excellent porosity, no shows
	Tr	Siltstone - buff to brown, firm, argillaceous to sandy
	Tr	Pyrite
	Tr	Coal
4400-4410	100	Quartz sand - as above
	Tr	Coal - as above
4410-4420	100	Quartz sand - as above
4420-4430	100	Quartz sand - as above
	Hvy Tr	Coal - black, clean, brittle
4430-4440	100	Quartz sand - as above
	Hvy Tr	Coal - black, clean, brittle
	Tr	Siltstone - buff, sandy, slightly carbonaceous
4440-4450	100	Quartz sand - as above
	Tr	Coal
4450-4460	100	Quartz sand - white, medium to granular (coarse to very coarse), loose, angular to subrounded, fairly sorted, excellent porosity, no shows
	Tr	Coal - black, brittle
	Tr	Sandstone - very fine, buff, dolomitic to siltstone, sandy
4460-4470	100	Quartz sand - as above
	Tr	Coal
	Tr	Siltstone - brown, micaceous, carbonaceous, soft to firm
4470-4480	100	Quartz sand - medium to granular (coarse to very coarse), as above
	Tr	Coal - as above
4480-4490	100	Quartz sand - as above
	Tr	Coal - as above
	Tr	Siltstone - medium brown, argillaceous, soft to firm, slightly micaceous
4490-4500	70	Coal - as above, trace fluorescence, vitrinite and siltstone associated with coal, no cut except with crushing
	30	Quartz sand - as above
4500-4510	80	Quartz sand - as above
	15	Coal - as above with vitrinite, trace associated white to buff siltstone, trace fluorescence, as above
	5	Siltstone - medium brown, slightly sandy, slightly micaceous, firm, slightly laminated
4510-4520	90	Quartz sand - as above
	10	Coal - as above
	Hvy Tr	Siltstone - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
4080-4090	100	Coal
4090-4100	100	Coal
4100-4110	100	Coal
4110-4120	100	Coal
	Tr	Sand - very fine to fine grained, subangular to rounded, loose, no shows, fair to good sorting
4120-4130	95	Coal - as above
	5	Sand - very fine to coarse grained, mostly fine grained, sub-angular to rounded, loose, fair sorting, good porosity, no shows
4130-4140	95	Coal
	5	Sand - as above, no shows
4140-4150	60	Coal - as above
	40	Siltstone - dark brown to black, very carbonaceous, coaly, firm, grading in part to coal
	Tr	Sandstone - as above
4150-4160	80	Coal - as above
	20	Siltstone - as above
	Tr	Sandstone - as above
4160-4170	50	Coal
	30	Siltstone - as above
	20	Sandstone - loose, fine to very coarse grained, subangular to rounded, poor to fair sorting, clear quartz, fair porosity, no shows, trace dolomite cement
4170-4180	80	Coal - as above, with trace amber
	10	Siltstone - as above
	10	Sandstone - very fine to coarse grained, mostly very fine to fine grained, as above, no shows
4180-4190	70	Coal - as above
	30	Sandstone - fine to coarse grained, mostly medium grained, loose, well sorted, clear to white, subangular to rounded, very good porosity, no shows
4190-4200	70	Coal - as above
	30	Sandstone - fine to very coarse grained, mostly coarse grained, as above, no shows
4200-4210	60	Coal - as above
	40	Sandstone - coarse grained, subangular to subrounded, as above, no shows, trace dolomite cement
4210-4220	60	Sandstone - loose, clear to white, medium to very coarse grained, mostly coarse to very coarse, subangular to subrounded, well sorted, very good porosity, no shows
	40	Coal - as above
4220-4230	100	Coal
	Tr	Sandstone - as above

SAMPLE DESCRIPTIONS

BARRACOUTA-4

DEPTH	%	DESCRIPTION
		Drill to 4232'. POH log. Drill to 4240 POH log. U/ream to 15". Run 10-3/4" liner, POH with liner. Drill to 4254', POH. Run and cement liner. Drill to 4274'. Run PIT - 11.2 MW, 530 psi over - 13.5 MWE. Drill
4250-4260	100	Cement
	Tr	Coal
4260-4270	100	Coal - black, slightly silty
	Tr	Siltstone - dark brown, carbonaceous, soft
	Tr	Cement
4270-4280	100	Coal - black, slightly silty to siltstone, some interlaminations in sandstone, very fine, argillaceous, tight, no shows
	Tr	Siltstone - as above
	Tr	Sandstone - very fine, buff, dolomite to dolomite, sandy
4280-4290	100	Coal - as above
	Tr	Sandstone - as above
4290-4300	100	Coal - as above
	Tr	Sandstone - as above
	Tr	Siltstone - as above
4300-4310	80	Coal - as above
	20	Sandstone - fine to medium, white, loose, angular, poor to fair sorting, no shows, excellent porosity
	Tr	Sandstone - buff, very fine, argillaceous, tight, no shows
4310-4320	70	Sand - quartzose, white, medium to coarse, loose, angular to subrounded, fair sorting, no shows, excellent porosity
	5	Sandstone - buff, very fine, argillaceous, dolomitic, tight, no shows
	25	Coal - as above
4320-4330	90	Sand - quartzose, as above
	10	Coal - as above
	Tr	Sandstone - buff, very fine, as above
	Tr	Siltstone - medium brown, firm, carbonaceous
	Tr	Pyrite aggregates
4330-4340	100	Quartz sand - white, medium to very coarse, as above
	Tr	Coal
	Tr	Sandstone - very fine, as above
4340-4350	95	Quartz sand - as above, many grains fractured
	5	Coal - as above
	Tr	Sandstone - very fine, buff, dolomitic, as above
4350-4360	100	Quartz sand - as above, medium to granular (<u>very coarse</u>)
	Tr	Coal, pyrite, dolomite/sandstone
4360-4370	100	Quartz sand - as above, fine to very coarse (<u>coarse</u>)
	Tr	Coal, pyrite, dolomitic sandstone
4370-4380	100	Quartz sand - as above, fine to very coarse (<u>medium to coarse</u>)
	Tr	Coal, dolomitic sandstone
	Tr	Siltstone - brown, firm, sandy, dolomitic

APPENDIX II

APPENDIX 2

SIDEWALL CORE DESCRIPTIONS

PAGE 1 OF 2

ATT 60 REC 57

DATE 4.4.77

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 1 SWC RUN NO 2

WELL BARRACOUTA-4

GEOLOGIST R.G. BELLIS

SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
1	3200	1½	Calc. clyst	Tr.fine mica	v	lt.gn -gy.	soft	clay	-	-	70%										NS		Impermeable
2	3181	1½	Calcn	Glauc., fine mica	v	lt.gy	firm-semi friab.	slt-v.f.	p.	sa-sr	60										NS		Appears leached but impermeable
3	3164	1 3/8	Calcn.	Glauc.,fine mica,mottled cream,fine calc streaks v.c.ang.cal.	v	cm-lt gy.	soft	slt-v.f.	p.	sa-sr	60										NS		
4	3140	1½	Calcn	wh.speckled calcite (fos-sil) in dk. matrix.	v	lt.gn -gy	firm	slt-v.f.	p.	sa-sr	60										NS		
5	3120	1½	Calcn	Spotty with glauc.	v	buff-cream	firm-semi friab	slt-m.	p.	sa-sr	40										NS		
6	3100	3/4	Limey sst.	Glauc.	v	cream	v.fri	vf-vc	vp.	sr-r.	10										NS		Loose qtz grains in a cream calc clay /silt matrix
7	3084	½	Limey sst.	Gran. qtz. & glauc. cemented by weak calc cly/slt flour.	v	buff-cream	v.fri-uncon solid.	vf-vc	vp.	sr-r.	10										NS		
8	3060	3/8	Limey sst.	Gran.qtz & glauc + rare bryozoa in calc flour matrix.	v	buff-cream	v.fri-uncon solid.	vf-vc	vp.	sa-r	10										NS		Most of sample washed out.
9	2938	NR	-	-	-	-	-	-	-	-	-										-		Misfire
10	2922	1/8	Limey sst.	Loose qtz & glauc.weakly cemented by calc flour	v	buff-cream	v.fri-uncon solid.	vf-vc	vp.	r-sr.	10										NS		Sample washed badly.

FORM R 257 3.78

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL ... GEOLOGIST R.G. BELLIS ... SERVICE CO SCHLUMBERGER ... IES RUN NO 2 ... SWC RUN NO 1 ... DATE 4.4.77 ... ATT 60 ... REC 57

NO.	DEPTH	REC	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
11	2897	3/8	Limey sst.- Calc. slst.	Loose qtz, glauc., cemented by calc flour.	v	buff-cream	firm-friab	f-vc	vp	sa-r	10%										NS		Sample badly washed. Slst may be contamination.
12	2872	NR	-	-	-	-	-	-	-	-	-										-		Misfire
13	2820	1/8	Calc. slst	Bryozoa, qtz.	v	m-gy bn	hard	slt-v.f.	vp.	sa-sr	20										NS		
14	2803	7/8	Sandy calcn	Loose qtz & glauc. in a gran. carb.	v	cream -wh.	v.fri -uncon solid	slt-m.	p.	sa	30										NS		Qtz. & glauc. in a fri. carb. vf-m flour.
15	2762	1½	Clean calcn	Glauc., rare qtz.	v	buff-cream	v.fri	slt-vc.	vp.	sa	30										NS		Friable carbonate sand.
16	2706	2	Dirty calcn	Qtz., glauc. & vc carbonate grains.	v	m.gy-bn.	firm-semi friab	slt-vc	vp.	sa-sr	60										NS		Dirty calcarenite.
17	2663	1¼	Dirty calcn	Glauc., rare qtz.	v	m.gy-bn.	firm-semi friab	slt-vc	vp.	sa-sr	60										NS		
18	2654	1½	Calc. Slst	-	v	lt.gn-gy	firm	slt-vf	p.	sa-sr	60										NS		
19	2608	1½	Calc. slst	-	v	lt.gn-gy	firm	slt-vf	p.	sa-sr	60										NS		
20	2566	1 3/4	Calcn.	-	v	m.gn-gy	firm	slt-f	p.	sa-sr	60										NS		Calcarenite leaching giving a vuggy porosity.
21	2520	1¼	Calcn.	-	v	m.gn-gy.	firm	slt-vf	p.	sa-sr	60										NS		
22	2480	1 3/8	Calc. slst clyst	-	v	m.gn-gy.	hard-firm	cly-vf	p.	sa-sr	60										NS		
23	2435	1 5/8	Calc. slst.	F.wh.carb. flour.	v	m.gn-gy	firm	slt-vf	p.	sa-sr	60										NS		

FORM R 257 3-72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL BARRACOUTA-4 | PAGE ... OF ...
GEOLOGIST R.G. BELLIS | ATT 60 REC 57
SERVICE CO SCHLUMBERGER | DATE 4.4.77
IES RUN NO ... 2 ... SWC RUN NO 1 & 2

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
24	2395	1 3/4	Calc. slst/ clyst.	Wh.carb. flour-speckled	v	dk.gy	firm	cly/ slt.	p.	-	75										NS		
25	2341	1 3/8	Calc. clyst	-	v	dk.gy	firm	clay	-	-	60										NS		Shows some fissility trend - calc. shale.
26	2300	1 1/8	Calc. slst	-	v	lt.gy	firm	slt	f.	sa-sr	60										NS		
27	2260	1 3/8	Calc. slst.	-	v	lt.gn-gy.	firm	silt	f.	sa-sr	60										NS		
28	1181	1 3/8	Calcn	Bryozoa	v	gn-gy	firm-semi friab	vf-m	p	sa-sr	60										NS		
29	1042	2	Calcn	Bryozoa, forams.	v	gn-gy	firm-friab	vf-c	p.	sa-sr	60										NS		
30	929	2 1/4	Calcn.	Lge.carb. grains in v. f.carb.cemt	v	gn-gy	firm-friab	slt-c	vp	sa-sr.	60										NS		Speckled - wh.carb. spots in dk.matrix.
31	3054	1/2	Limey sst.	Qtz.grains in carb.flour matrix/cemt.	v	cream	hard-friab	vf-vc	vp	sa-r.	20										NS		
32	2930	1 3/4	Calcn.	Rare qtz.	v	m.gy	firm-semi friab	slt-c	vp	sa-sr	50										NS		
33	2884	1/8	Calcn.	Qtz.- loose c.grains.	v	dk gy	hard	slt-vf	f	sa-sr	60												
34	2730	1	Limey sst.	Loose qtz. & glauc. in carbonaceous matrix.	v	cream -buff	hard-friab	slt-vc	vp	sa-sr	20												Well rounded qtz. & glauc.
35	2218	1	Calc. slst.	-	v	lt.gn-gy	firm	silt	f.	-	60%										NS		
36	2166	NR	-	-	-	-	-	-	-	-	-										-		

FORM R 257 3 72

PAGE ... OF ...

ATT 60 REC 57

DATE 4.4.77

SWC RUN NO 2

IES RUN NO 2

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

WELL BARRACOUTA-4

GEOLOGIST R.G. BELLIS

SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROD PROD 22	REMARKS - GAS 23
37	2117	2¼	Calc. clyst	Glauc.,v.f. wh. carb.	v	dk gy	soft	clay	-	-	70%										NS		
38	2088	2	Calc. clyst /shale	Forams, wh. carb.	v	dk.gy	soft-firm	clay	-	-	70										NS		Slightly fissile
39	2050	2¼	Fossil-ifer. shale	Brozoans, forams.	v	dk.gy	firm	clay	-	-	70										NS		Fissile; fossils ~~give speckled app.~~
40	2000	2¼	Calcn	Bryozoa	v	dk.gy	firm	clay	-	-	70										NS		Speckled.
41	1950	½	Calcn	Grain qtz. & glauc. + carbonaceous grains.	v	buff-cream	hard-semi friab	slt-vc	vp.	sa-r.	20										NS		Nil effective porosity & permeabilit ?channel Miocene fill.
42	1900	2¼	Calc. clyst	Wh.carb., ? fossils	v	dk.gy	firm-hard	clay	-	-	70										NS		
43	1860	1½	Calcn	-	v	lt.gn-gy	firm	slt-m.	vp.	sa-sr	60										NS		
44	1816	1⅜	Calcn.	-	v	buff-gn.gy	sl.fm -sft.	slt-f.	vp	sa-sr	60										NS		
45	1764	2	Calcn.	-	v	gn-gy	hard-firm	slt-f.	vp.	sa-sr	60										NS		
46	1715	1⅞	Calc. clyst	Skeletal frags,, c. carb. grains.	v	dk.gn -gy	semi friab	clay	-	-	70										NS		Gritty feel due to incl. carb. grains
47	1668	2	Skel. calc/ Clyst.	Carb.skeletal debris & f.-c. carb. grains.	v	dk.gn-gy	firm	clay	-	-	70										NS		
48	1632	2	Calcn	Forams,fos-sil debris.	v	m.gn-gy	firm	slt-m.	vp.	sa-sr	60										NS		
49	1600	2⅛	Calcn	Skeletal frags.	v	gn-gy	firm	slt-m	vp.	sa-sr	60										NS		

FORM R 257 3 72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL ..... PAGE ..... OF .....
GEOLOGIST R.G. BELLIS ATT 60 REC 57
SERVICE CO SCHLUMBERGER DATE 4.4.77
RUN NO 2 SWC RUN NO 2

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
50	1576	2	Calcn.	Skeletal fragments.	v	gn-gy	firm	slt-m.	vp.	sa	60%										NS		
51	1533	1½	Calcn.	C.-vc angl. carb.frags.	v	lt.gy	friab	slt-vc.	vp	sa-sr	40										NS		
52	1493	2	Calcn	Skeletal frags.,glauc	v	lt.gy-buff	friab	slt-m.	vp.	sa-sr	40										NS		Granular.
53	1452	2	Calcn.	Skeletal, glauc.	v	Lt.gy-buff	friab	slt-m.	vp	sa-sr	40										NS		Granular
54	1405	1¾	Calcn	Carb.,skeletal,glauc. grains in buff carb. cement.	v	buff-cream	firm-friab	slt-m.	vp.	sa-sr	60										NS		
55	1362	2	Calcn	-	v	buff-lt.gn	firm	slt-vf	p.	sa-sr	60										NS		
56	1320	1⅝	Calc. slst.	-	v	buff-lt.gn	firm	slt.	f.	sa-sr	60										NS		
57	1252	2	Calcn	V.f.glauc.	v	buff	firm	slt-vf	p.	sa-sr	60										NS		
58	1138	2	Calcn	Glauc.,skeletal ?,frags glauc.	v	buff	semi-firm-soft	slt-vf	p.	sa-sr	60										NS		
59	1088	2	Calcn	Glauc.,skel. frags.	v	gn-gy	semi-fm.	slt-vf	p.	sa-sr	60										NS		
60	758	2¼	Calcn	Glauc.,mica skeletal frags.	v	gn-gy	semi-firm-soft	silt-v.f.	p.	sa-sr	60										NS		

FORM R 257 3.72

BARRACOUTA-4

Sidewall Core Descriptions

Runs 1 & 2, Detail

SWC No.	Depth	Description
14	2803'	Sandstone - light grey, medium to coarse grained, calcareous, very friable, excellent porosity, very fossiliferous (forams), occasional glauconite. Grains are subangular to well rounded, fine sorting, common silty matrix.
13	2820'	Siltstone - medium grey, calcareous, calcite veining and large fossiliferous material (echinoid spines, bryozoa), occasional quartz grains (medium sized), soft to firm.
33	2884	Siltstone - as above, occasional forams, no large fossils, trace pyrite veins.
11	2897	Sandstone - white, medium grains, very friable, slightly calcareous, well rounded grains, fine to good sorting, trace glauconite. Siltstone - medium grey, as above.
10	2922	Sand - white, coarse to very coarse grained, unconsolidated, well rounded grains, good sorting, trace glauconite, not valid wall rock.
32	2930	Siltstone - medium grey, very sandy, very calcareous tending to calcarenite, firm.
31	3054	Sandstone - white, medium grained, very calcareous, firm, low porosity, abundant clay matrix, poor porosity.
8	3060	Sandstone - white, coarse to very coarse grained, firm to hard, calcareous cement, low porosity, argillaceous, poor sorting, grains are angular to subrounded, trace glauconite, trace limestone.
7	3084	Sandstone - white to light grey, very fine to fine and coarse to very coarse grained, firm, calcareous, bimodal, argillaceous, poor porosity, glauconitic, subrounded to rounded.
6	3100	Sandstone - white, very fine to very coarse grained, bimodal (very fine to fine, coarse to granular), friable, calcareous, argillaceous, poor porosity, glauconitic, lime-pyrite, coarse fractions, subangular to subrounded.
5	3120	Siltstone - medium grey, firm, very calcareous with abundant calcarenite material, abundant glauconite, abundant small fossils.
4	3140	Siltstone - medium grey, soft to firm (slightly plastic), very calcareous, argillaceous, abundant calcareous material.
3	3164	Siltstone - medium grey, soft to firm, very calcareous, abundant calcarenite and abundant coarse to very coarse fossil material.
2	3181	Siltstone - medium grey, firm, very calcareous, abundant planknotic (and benthonic) forams, common glauconite pellets, slight laminations (light to dark).
1	3200	Claystone - light grey, firm, very calcareous, occasional coarse fossils (echinoid spines).

PAGE 1 OF 3

ATT 30 REC 30

DATE 12.4.77

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 5 SWC RUN NO 3

WELL BARRACOUTA-4

GEOLOGIST G.ILES/ATKINS.

SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
61	4006	1¼	Slst	sdy,carb,	-	m.-dk.	sft-	slt-m	-	-	sl												
				mic.		brn.	firm																
62	3948	1½	Sst.	slty,arg.	v.sl	bf-lt	sft-	vf-cs	v.pr	sa-	m	-	40	strky	f.	yellow	str	lt bl	wk	clr			
						brn	firm			sr													
63	3912	1	Sst.	Sl.mic,arg.	-	lt gy	firm	vf	f.	sa	m												
64	3858	1½	Sst.	v. arg.	-	dk bn	sft	f-cs	v.p.	sa	abd						v.wk	v.lt.					
																		bl.					
65	3841	1½	Sst.	v.arg, mic.	-	bn.	sft.	f-cs	v.p.	sa	abd						v.wk.	v.lt.					
				sl. carb.														bl					
66	3834	1	Slst.	sl. mic.,sl.	-	buff	sft.	slt.	-	-	abd						v.wk.	v.lt.					
				carb.														bl.					
67	3797	1	Sst.	v. arg.	-	dk bn	firm	f-m	p.	sa	abd						wk	v lt					
																		bl.					
68	3734	1	Sst	arg.	-	dk bn	v.sft	f-m	f.	sa-	m												
										sr													
69	3704	1¼	Shale	carb,sl.mic	-	gy-bn	firm										f.	wh-bl					
				sl.sdy.																			
70	3642	1½	Sst.	arg, slty,	-	gy	firm	v.f.	f.	sa	abd												
				sl. mic.																			
71	3605	3/4	Sst.	sl. carb.	m	lt.gy.	sft.	f.	f-w	sa-	sl												
										sr													
72	3594	3/4	Sst.	sl.calc.	sl	buff-	sft.	f-m	f.	sa	sl												
						lt gy																	
73	3506	3/4	Sst*	friable	-	buff	sft.	cs-v.	f.	sa-	sl												*Probably qtz.
								cs.		wr													grains in mudcak
74	3482	1½	Sst.	sl.mic.,arg	-	bn.	fri.	f-v.	p.	sa-	abd												
								cs.		wr													

FORM R 257 3/72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL BARRACOUTA-4 PAGE 2 OF 3
GEOLOGIST GILES/ATKINS ATT 30 REC 30
SERVICE CO SCHLUMBERGER DATE 12.4.77
IES RUN NO 5 SWC RUN NO 3

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
75	3468	1 3/4	Sst.	sl.mic, carb	-	brn	fri.	f-grn	p-f	sa-	m												
				argil.						wr													
76	3460	1½	Sst.	mic,sl.arg.	-	lt gy	fri.	vf-f	g.	sa	sl				wk.	wh-bl							
77	3456	1½	Sst.	-	-	lt gy	fri	vf-f	f.	sa	sl				v.wk	bl-wh							
78	3454	1½	Sst.	sl,glauc,arg	-	gy.	fri.	f-cs	p.	sa.	m												
79	3450	2	Slst	abd glauc,	sl	gy-bn	fm				m				wk	bl-wh							
				abd. pyr,																			
				tr qtz.																			
80	3447	2	Slst	abd.glauc,	-	gy-bn	fm				m				wk	bl-wh							
				abd. pyr,																			
				tr.qtz.																			
81	3443	2	Slst	abd.glauc,											v.wk	bl-wh							
				abd. pyr,																			
				tr. qtz.																			
82	3438	2	Slst	abd.glauc,	-	brn-	fm				m												
				pyr, tr.		green																	
				coarse qtz.																			
83	3430	2	Slst	abd.glauc,	sl	gr-gn	fm.				abd.												
				pyr, tr. m-																			
				cse qtz.																			
84	3412	2	Marl	mod.glauc,	very	buff	fm				abd.												
				pyr.																			
85	3400	2	Slst	v.calc., tr.	v.	buff-	fm				abd.												
				glauc, pyr.		lt gy																	
86	3386	1 3/4	Slst/	tr.glauc,	v.	buff.	fm																
			Marl	pyr, forams																			
87	3377	1½	Marl	tr.pyr,mica	v.	buff-	fm				abd.												
						gy																	

FORM R 257 3/72

PAGE 3 OF 3

ATT 30 REC 30

DATE 12.4.77

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 5 SWC RUN NO 3

SERVICE CO SCHLUMBERGER

GEOLOGIST GILES/ATKINS

WELL BARRACOUTA-4

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
88	3323	1½	Slst.	abd.glauc,	v.	gy-gn	fm.				abd.												
				fossils																			
89	3272	2	Marl/	homog. tr	mod	gy	fm				abd												
			Clyst	fossils																			
90	3214	2	Slst	abd.glauc,	v.	gy	fm				abd.												
				forams																			

FORM R 257 3/72

PAGE 1 OF 2 ATT 30 REC 30 DATE 23.4.77

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

IES RUN NO 4 SWC RUN NO

WELL BARRACOUTA-4
GEOLOGIST J. DAVIS
SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROD PROD 22	REMARKS - GAS 23
91	4780	1	Sst.	Qtz , carb.	-	lt gy	sft,	vf	w	sr											NS		Abundant carb.
							friab																laminae
92	4776	3/4	Sst.	Qtz.	-	m-olive	sft,	m-vc	p	sr-											NS		
						brn.	friab			sa													
93	4756	3/4	Slst	Qtz, argil.	-	lt gy	sft	silt	-	-											NS		Pyrite nodules
94	4753	1¼	Clyst	Carb.	-	lt gy	sft														NS		Puggy/carbonaceous
						-brn																	crumbly.
95	4739	3/4	Clyst	Mica, carb.	-	m gy-	soft														NS		Crumbly.
						brn																	
96	4655	1½	Sst.	Qtz.	-	lt gy	fri,	m-c	m	sr-	15%		5%	Spty	fnt	white	fnt.	white					
							soft			sa													
97	4653	1½	Sst.	Qtz.	-	lt ol	fri,	m-vc	m	sr-											NS		
						grey	soft			sa													
98	4651	1¼	Sst.	Qtz, mica	-	lt gy	fri,	m-c	m	sr-	25%		40%	ev	fnt	white	fnt	white					
							soft			sa													
99	4648	1¼	Sst.	Qtz.	-	lt ol	fri,	m-vc	m-p	sr-	10-	clear	90%	ev	bri	white	bri	white	tr	clear	0	Oil	
						grey	soft			sa	15%												
100	4646	1½	Sst.	Qtz, mica	-	lt ol	fri,	m-c	m	sr-	15-	clear	25%	spty	dull	white	dull	white	tr	clear	0	Oil	
						gry	soft			sa	20%												
101	4644	1¼	Sst.	Qtz,rk.frag.	-	lt gy	fri,	m-vc	p	sr-	25-	clear	80%	ev.	bri.	white	bri.	white	tr	clear	0	Oil	
							soft			sa	30%												
102	4642	1	Sst.	Qtz.	-	lt gy	fri,	f-vc	p	sr-	>30%	clear	80%	ev	bri	white	bri	white	tr	Clear	0	Oil	
							soft			sa													
103	4640	1½	Sst	Qtz.	-	lt ol	soft	m-vc	p	sr-	5-	clear	90%	ev	bri	white	bri	white	tr	clear	0	Oil	
						grey				sa	10%												
104	4638	1½	Sst.	Qtz.	-	lt ol	soft	m-vc	p	sr-	10%	Clear	40%	spty	bri	white	bri	white	tr	clear	0	Oil	Sediment washed by
						grey				sa													filtrate. Good porosity.
105	4636	1½	Sst.	Qtz,rk.frag	-	lt ol gy	soft	m-vc -gran	p	sr- sa	10% ↑ % of original porosity.	clear	90%	ev	bri	white	bri	white	tr	clear	0	Oil	

FORM R 257 3/72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL BARRACOUTA-4 | PAGE 2 OF 2
GEOLOGIST J. DAVIS | ATT 30 REC 30
SERVICE CO SCHLUMBERGER | DATE 23.4.77
IES RUN NO 4 | SWC RUN NO

NO. 1a	DEPTH 1	REC 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
106	4634	1½	Sst.	Qtz.	-	lt gy	soft	m-vc	m-p	sr-	10%	clear	60%	ev	bri	white	bri	white	tr	clear	0	Oil	
										sa													
107	4632	1¼	Sst.	Qtz.	-	lt gy	soft	f-m	w	sr-	10-	clear	25%	spty	dull	white	dull	white	tr	clear	0	Oil	
							fri			sa	15%												
108	4550	3/4	Sst/	Qtz, arg,	-	lt gy	soft	ss-	w	sr											NS		Carb. laminae
			Slst.	carb.				vf															
109	4516	1½	Clyst	-	-	lt gy	firm														NS		Puggy/plastic,
																							v.little carb.
110	4511	1¼	Clyst	-	-	lt gy	firm														NS		Plastic, v. littl
																							organic material
111	4489	1	Clyst/	Carb.	-	lt gy	firm														NS		Laminated grey
			Slst.			-m brn																	Slst. & brn. carb Clyst.
112	4459	3/4	Slst/	Qtz, carb.	-	lt gy	fri-	ss-vf													NS		Carb. laminae
			v.f.sst			-m brn	firm																
113	4384	3/4	Clyst	Carb.	-	buff-	firm														NS		Pyrite nodules, v fine carb. debris
						m brn																	
114	4382	1½	Sst.	Qtz.	-	m-ol.	fri.	vf-vc	p	sr-	5-										NS		Bimodal v.cse.
						brn				sa	10%												sand framework,
																							v.f. sand matrix
115	4308	3/4	Slst.	Argillaceous	-	lt gy	firm														NS		V. Clayey Slst.
116	4306	1½	Clyst	Micaceous	-	lt gy	firm														NS		
117	4274	3/4	Slst	Arg, carb.	-	buff-	firm														NS		Laminated
						m brn																	
118	4264	1¼	Sst.		-	buff-	fri.	f	w	sr-											NS		Laminated
						lt gy				sa													
119	4251	1	Slst	Carb.	-	lt gy	firm														NS		Carb. laminations
120	4250	1¼	Sst.	Clayey	-	lt gy	firm-	vf	w	sr											NS		Minor carb.
							fri.																laminae.

FORM R 257 3/72

APPENDIX III

APPENDIX 3

CORE DESCRIPTIONS

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 1

WELL: BARRACOUTA-4

Interval Cored 4568-4595* **ft., Cut** 27 **ft., Recovered** 19 **ft., (** 70 **%) Fm.** Latrobe

Bit Type C-22 **, Bit Size** 8-15/32 **in., Desc. by** J. Davis **Date** 21.4.77

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8			4568-4568'4"	SANDSTONE: poorly consolidated, poorly sorted. Medium sand - granule grades, mainly very coarse sand. Almost entirely quartz. 1-2% fresh and altered white mica, good porosity
			4568'4"-4569'	SANDSTONE: moderately consolidated, poorly sorted. Medium sand to granule grades, mainly very coarse sand - granules. Mainly quartz. 1-2% felspar and rock fragments. Subrounded to subangular. Grains are strongly cemented by fine quartz and clay. Trace pyrite.
			4569'-4569'3"	SANDSTONE: moderately consolidated. Poorly sorted. Mainly medium grained, subangular to subrounded. Strongly cemented by fine quartz and minor clay. Subparallel bedding with a few shale laminae.
			4569'3"-4569'6"	SHALE: light to mid-grey, subhorizontal laminations, few thin laminae of quartz sand and light grey claystone.
			4569'6"-4571'6"	SANDSTONE: moderately consolidated. Mainly medium to coarse grained with minor fine, very coarse and granule grades, poorly sorted, subangular to subrounded. Mostly quartz with traces of weathered felspars and rock fragments. Cemented by very fine quartz and clay, good porosity.
			4571'6"-4573'	SANDSTONE: poorly consolidated, poorly sorted, subangular to subrounded, medium sand to granule grades. Almost entirely quartz with minor rock fragments and altered felspar. Prominent amount of clay in the rock which is probably original cement. Trace of pyrite cement.
			4573'-4575'	SAND: unconsolidated. Poorly sorted, subangular to subrounded. Fine sand to granule grades - mainly medium to coarse sand. Almost entirely quartz. Minor clay balls.
			4575'-4576'9"	SANDSTONE: moderately consolidated. Poorly sorted. Mainly coarse sand to granule grades. Appears to be bimodal in parts with coarse mode of coarse sand - granules and fine mode of very fine quartz sand and clay matrix/cement. Mainly quartz, minor rock fragments. Very minor shale/coal clasts.

REMARKS:

* Core adjusted to Run-5 FDC log (up 7')

...Continued over...

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 1 (Cont'd)

WELL:

Interval Cored ft., Cut ft., Recovered ft., (%) Fm.

Bit Type, Bit Size in., Desc. by Date

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
			4576'9"-4583'6"	SAND: Unconsolidated apart from 3 two inch beds. Very poorly sorted. Fine sand to granule grades. Mainly very coarse sand to granules. Subangular to subrounded. Mainly quartz with minor rock fragments.
			4583'6"-4584'9"	SAND: unconsolidated. Mainly moderately sorted, medium to coarse quartz sand. Grades into poorly sorted medium sand - granules over top 6". Subangular to subrounded quartz. Promiment clay cement.
			4584'9"-4586'	SANDSTONE: moderately sorted. Moderately consolidated Very friable due to weak clay cement. Medium to coarse grained. Almost entirely quartz.
			4586'-4587'	SAND/SANDSTONE: unconsolidated sand with a few lumps of poorly consolidated sandstone. Moderately sorted. Medium to coarse grained. Subangular to subrounded. Mainly quartz with abundant clay cement. Minor clay streaks in sandstone lumps.
			4587'-4595'	NO RECOVERY.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

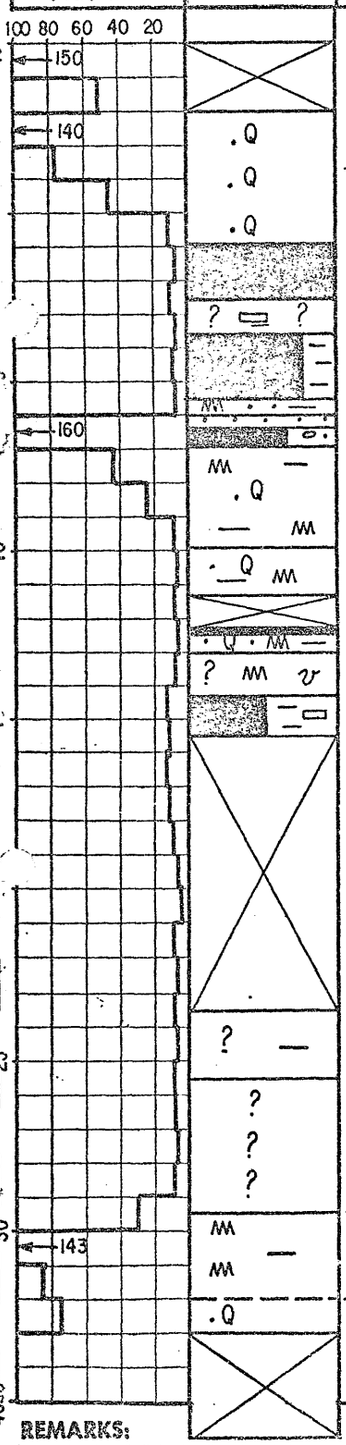
CORE DESCRIPTION

Core No. 2

WELL: BARRACOUTA-4

Interval Cored 4595-4636* ft., Cut 41 ft., Recovered 27 ft., (66 %) Fm. Latrobe

Bit Type C-22, Bit Size 8-15/32 in., Desc. by S.D. Giles Date 21.4.77



Interval (ft.)	Descriptive Lithology
4595'-4597'	NO RECOVERY.
4597'-4598'6"	SANDSTONE: white to buff, fine to granular (coarse), quartz, poorly sorted, subangular to subrounded, moderately argillaceous, friable, good porosity, no shows.
4598'6"-4599'	SANDSTONE: grey, medium grained, quartzose, slightly micaceous, slightly lithic, slightly argillaceous, moderately sorted subangular, firm, good porosity, no shows
4599'-4601'	SANDSTONE: brown (drill mud), very coarse to granular, quartzose, moderately sorted, subangular to subrounded, friable, excellent porosity, no shows.
4601'-4602'6"	COAL: black to brown, dirty, woody, fractured.
4602'6"-4603'6"	CLAYSTONE: medium brown, slightly carbonaceous, slicken sides (30°).
4603'6"-4605'6"	COAL: black, very silty, pyritic, woody, soft; interlaminated with shale, very carbonaceous, grading to coal (0.5 to 2.0cm).
4605'6"-4606'	CLAYSTONE: grading down to siltstone, medium brown, carbonaceous, micaceous, soft to firm
4606'-4606'2"	SANDSTONE: brown, medium to granular (very coarse), quartzose, moderately clean, poorly sorted, subangular, friable, excellent porosity, no shows.
46-6'2"-4606'9"	COAL: black, very dirty, very micaceous (large flakes of white mica), woody fragments; interlaminated with sandstone, white, medium to coarse, argillaceous, carbonaceous, dirty, poorly sorted, subangular to subrounded, no hsows.
	SILTSTONE: light brown, sandy, carbonaceous (0.1-1.0cm).
4606'9"-4609'9"	SILTSTONE/SANDSTONE interlaminated 0.05-0.1cm 80:20 Wavy and ripple bedded, slightly burrowed (0.1cm subvertical, filled with sandstone). SILTSTONE: medium grey, carbonaceous, micaceous, abundant plant remains on partings. SANDSTONE: white to very light grey, very fine grained, slightly argillaceous, firm, poor porosity, no shows, slightly pyritic.
4609'9"-4611'3"	SILTSTONE/SANDSTONE: as above, 60:40

REMARKS:

Samples for palaeo at 4601', 4608', 4610'5", 4619' and 4622'.

Waxpack: 4629'6" - 4633'0"

*Cores adjusted to Run-5 FDC log (with alteration for No Recovery intervals)

....Continued over...

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 2 (Cont'd)

WELL:

Interval Cored ft., Cut ft., Recovered ft., (%) Fm.

Bit Type , Bit Size in., Desc. by Date

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0			4611'3"-4612'3"	NO RECOVERY.
			4612'3"-4612'5"	COAL: black to brown, silty, dirty.
			4612'5"-4613'	SILTSTONE/SANDSTONE: As above, 30:70
			4613'-4614'3"	CLAYSTONE/SILTSTONE: wavy interlaminations 0.05-0.5 cm, 50:50. Burrows and roots 0.1-1.0cm, subvertical; very pyritic, especially in burrows. CLAYSTONE: dark brown, very carbonaceous. SILTSTONE: light brown, slightly carbonaceous.
			4614'3"-4615'6"	COAL: black, bright, clean at top, grading to SHALE: black, very carbonaceous, at base.
			4615'6"-4623'6"	NO RECOVERY.
			4623'6"-4625'6"	CLAYSTONE: very light grey to green, puggy, rare carbonaceous rootlets, conch. fractures
			4625'6"-4629'6"	CLAYSTONE: light grey to breen, firm, occasional rootlets, pyrite aggregates (1-2cm)
			4629'6"-4632'2"	SILTSTONE: light grey to buff, carbonaceous, abundant clay matrix, weakly laminated. Weak yellow fluorescence, moderately sorted, slow streaming white cut.
			4632'2"-4633'	SANDSTONE: light grey, fine to medium grained, quartz with minor mica, trace lithic, trace pyrite, clay matrix, thin coaly laminae. Moderately sorted, poor porosity, strong yellow fluorescence, streaming white cut.
			4633'-4636'	NO RECOVERY.

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

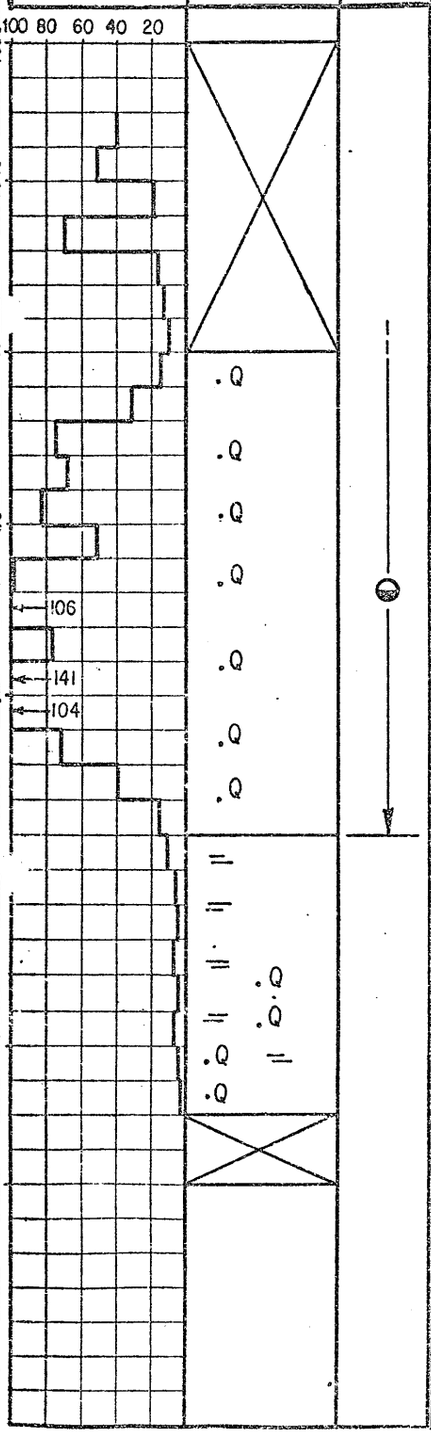
CORE DESCRIPTION

Core No. 3

WELL: BARRACOUTA-4

Interval Cored 4636-4669* ft., Cut 33 ft., Recovered 22 ft., (67 %) Fm. Latrobe

Bit Type C-22, Bit Size 8-15/32 in., Desc. by S.D. Giles Date 21.4.77



Interval (ft.)	Descriptive Lithology
4636'-4645'	NO RECOVERY.
4645'-4645'6"	~~SANDSTONE: white, medium to granular (coarse to very~~ coarse), quartzose, moderately sorted, white argillaceous matrix, rare thin carbonaceous laminae, poorly sorted, angular to subrounded friable, excellent porosity, strong petroliferous odour, strong yellow-white fluorescence, especially in matrix, inst. blue-white cut.
4645'6"-4646'3"	SANDSTONE: As above, loose.
4646'3"-4647'	SANDSTONE: As above, friable and clean
4647'-4650'6"	SANDSTONE: As above, moderately argillaceous matrix, loose
4650'6"-4651'	SANDSTONE: white, fine to granular (medium to coarse) quartz, slightly micaceous, clean, moderately sorted, angular to subrounded, friable, excellent porosity, strong petroliferous odour, streaky yellow-white fluorescence, inst. blue-white cut.
4651'-4655'	SANDSTONE: white, medium to granular (very coarse) grading to fine to coarse (medium) at base, quartzose, clean, moderately to well sorted, subangular to subrounded, friable, excellent porosity, strong petroliferous odour, medium to strong fluorescence, inst. blue-white cut.
4655'-4656'	SANDSTONE: white, medium to coarse, loose, as above.
4656'-4659'	SANDSTONE: white, medium to very coarse (medium), quartz, clean, medium to well sorted, subangular to subrounded, friable, excellent porosity, strong petroliferous odour, good fluorescence, except moderate fluorescence in last foot, inst. blue-white cut.
4659'-4667'	SHALE grading to SANDSTONE at approx. 4666'. SHALE: light grey, very slightly micaceous, rare rootlets, firm to hard, blocky fracture. SANDSTONE: light grey, very fine, argillaceous, moderately sorted, tight, no shows.
4667'-4669'	NO RECOVERY.

REMARKS: Interval 4645'-4659'; 4665'-4667' wax packed except where loose.

*Core adjusted to Run-5 FDC log (up 1').

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 4

WELL: BARRACOUTA-4

Interval Cored 4669-4703* ft., Cut 34 ft., Recovered 34 ft., (100 %) Fm. Latrobe

Bit Type C-22, Bit Size 8-15/32 in., Desc. by J. Davis Date 22.4.77

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 2 4 6 8				
4670'			4669'-4671'	SANDSTONE: light grey, fine, moderately to well sorted clay cement, consolidated but friable. Shallow angle, small scale cross beds and ripple beds. Bedding and cross bedding laminations clearly outlined by carbonaceous debris and mica flakes, strong petroliferous/H_2S smell when first cut but no fluorescence or cut, few nodules of pyrite.
			4671'-4673'	SANDSTONE: light grey, fine to medium grained, moderately sorted, abundant clay cement, grades from unit above but duffers in having only shallow angle medium scale cross beds and rare carbonaceous debris. No ripple bedding, higher energy environ. than above.
5'			4673-4675'	SANDSTONE: light grey, very clayey, fine grained, mainly quartz, with common mica and carbonate fragments. Pyrite nodules common - maybe related to burrows or roots. Horizontal to subhorizontal laminations and minor low angle ripple beds outlined by carbonaceous fragments.
90'			4675'-4677'3"	SANDSTONE: light grey, mainly fine grained, some medium, consolidated, friable, clayey. Similar bedding features to 4670-4672', abundant subhorizontal bedding planes outlined by carbonaceous fragments over lower 6". Several large nodules of pyrite - maybe related to organic activity.
			4677'3"-4683'6"	SAND/SANDSTONE: loosely consolidated lumps of soft friable sandstone and unconsolidated clayey sand, light to mid-grey, moderately sorted mainly medium grained, some coarse. Common carbonaceous streaks. Sand is mainly quartz but also contains common mica and carbonaceous fragments. Abundant weak white clay cement.
			4683'6"-4688'6"	SANDSTONE: consolidated but very soft and friable, light to mid-grey, mainly medium grained, as above, but with a few thin beds of coarse grained sandstone, grades into coarse sandstone over lower 18", moderately sorted, mainly subrounded quartz with minor rock fragments, mica and carbonaceous flakes. Abundant weak clay cement. Bedding mainly subhorizontal with minor shallow angle medium scale crossbeds. Carbonaceous fragments outline some bedding planes, pea sized pyrite nodules.

REMARKS:

*Core adjusted to Run-5 FDC log (down 1')

...Continued over...

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 4 (Cont)

WELL:

Interval Cored ft., Cut ft., Recovered ft., (%) Fm.

Bit Type , Bit Size in., Desc. by Date

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0			4688'6"-4689'6"	SANDSTONE: mid-grey, consolidated but friable, poorly sorted, mainly coarse grained to nodule grade (up to -3mm). Mainly subangular to subrounded, quartzose. Minor rock fragments, mica and carbonaceous fragments. White clay cement. Pyrite nodules commong.
			4689'6"-4695'6"	SAND: with minor lumps of loosely consolidated SANDSTONE: mid to dark grey/brown, moderately sorted, coarse to very coarse grained, subangular to subrounded quartz with minor mica, carbonaceous fragments, etc. Abundant white clay cement.
				All sediments from 4669' to 4695'6" had strong petroliferous/H_2S odours when freshly cut. However, none showed any fluorescence or cut.
			4695'6"-4703'	SAND and loosely consolidated very friable SANDSTONE: as above, coarse to very coarse with minor granules, moderate to poor sorting, light grey to mid brown/grey. Mainly subangular to subrounded quartz. Clayey cement but not as abundant as above, sediments minor carbonaceous fragments. No odour.

REMARKS:

APPENDIX IV

APPENDIX 4

FORMATION TESTING

(a) FORMATION INTERVAL TESTS

(b) REPEAT FORMATION TESTS

APPENDIX 4(a)

F.I.T. RECORD

GEOLOGIST S. GILES

WELL: BARRACOUTA-4 F.I.T. No. 1 @ 4635 ft. (G.R. Depth) DATE April 23, 1977

VALID TEST : Yes/~~No~~

FIRING METHOD Normal CHOKE SIZES 1 X 0.020"

TIMES : Tool Set 1931 Tool Open 1933 Min. Open 16 min Full After 14 min

Shaped Charge Shot: ~~Yes~~/No at -

Segregator Open 1949 Mins. Open 4 Full After 5 sec.

Tool Closed 1952 Tool Off 1954

MUD DATA :

Rmf 0.691 @ 74 °F, Equiv. Cl^- 4100 ppm (Resistivity)

Cl^- 4000 ppm NO^-3 160 ppm (Titration)

SAMPLE TAKEN AT END OF LAST CIRCULATION

RECOVERY - MAIN CHAMBER

120 p.s.i. SURFACE PRESSURE	- cc WATER
4.48 cft. GAS	1300 cc MUD
18,700 cc. OIL	Trace cc SAND

PROPERTIES - MAIN CHAMBER

GAS	C_1	C_2	C_3	C_4	C_5	C_6	
	45.4	2.1	0.5	0.3/0.3	0.1/0	0.02	M
	93.3	4.2	1.0	0.7/0.6	0.2	0.04	%

OIL 64 °API @ 72 °F; Pour Point ____ °F

Lt. Brn. Colour; Milky bl. wh. Fluorescent Colour

38 G.O.R.

WATER Rrf ____ @ ____ °F, Equiv. Cl^- ____ ppm (Resistivity)

Cl^- ____ ppm NO_3^- ____ ppm (Titration)

PRESSURES - MAIN CHAMBER

	Schlumberger	Amerada	Agnew	Amerada		Hewlett Packard*
Sampling (psi)	2000	1949				1945
Final Shut-in (psi)		2018				2016.49
Hydrostatic (psi)	2500	2500				2508.8

Sampling Time (Min) 16 (14)

Shut-in Time (Min) (2)

(*Corrected for Atmospheric pressure)

TEMPERATURES : (max recorded) 172 °F, 174 °F

MAX. DEPTH TOOL REACHED: 4700 Ft.

TIME SINCE CIRCULATION : 25.5 Hrs.

REMARKS : Successful oil test.

F.I.T. SEGREGATOR REPORT

GEOLOGIST GILES

WELL : _____ F.I.T. No. 1 @ 4635 ft.(G.R. Depth) DATE 23/4/77

SEGREGATOR TYPE _____ NUMBER 16 DATE OPENED _____

RECOVERY - SEGREGATOR

_____ p.s.i. SURFACE PRESSURE _____ cc WATER

_____ cft. GAS _____ cc MUD

_____ cc. OIL _____ cc SAND

PROPERTIES - SEGREGATOR

GAS	C_1	C_2	C_3	C_4	C_5	H_2S

OIL _____ °API @ _____ °F; Pour Point _____ °F

_____ Colour; _____ Fluorescent Colour

_____ G.O.R.

WATER Rrf _____ @ _____ °F, Equiv. Cl^- _____ ppm (Resistivity)

Cl^- _____ ppm NO_3^- _____ ppm (Titration)

PRESSURES - SEGREGATOR

	Schlumberger	Amerada	Agnew _____ Amerada _____	Hewlett Packard*
Sampling (psi)				
Final Shut-in (psi)				
Hydrostatic (psi)				
Sampling Time (Min)	5 sec.			
Shut-in Time (Min)	4 min.			

(*Corrected for Atmospheric pressure)

REMARKS : Segregator retained unopened.

F.I.T. RECORD

GEOLOGIST S. GILES

WELL: BARRACOUTA-4 F.I.T. No. 2 @ 4649 ft. (G.R. Depth) DATE April 23, 1977

VALID TEST : Yes/~~No~~

FIRING METHOD Normal CHOKE SIZES 0.020"

TIMES : Tool Set 2200 Tool Open 2202 Min. Open 21 Full After 21

Shaped Charge Shot: ~~Yes~~/No at -

Segregator Open 2223 Mins. Open 9 Full After 2

Tool Closed 2232 Tool Off 2235

MUD DATA :

Rmf 0.691 @ 74 °F, Equiv. Cl^- 4100 ppm (Resistivity)

Cl^- 4000 ppm NO^-3 160 ppm (Titration)

SAMPLE TAKEN AT END OF LAST CIRCULATION

RECOVERY - MAIN CHAMBER

0 p.s.i. SURFACE PRESSURE	20,000 cc WATER
0 cft. GAS	- cc MUD
Heavy scum cc. OIL	- cc SAND

PROPERTIES - MAIN CHAMBER

GAS	C_1	C_2	C_3	C_4	C_5	H_2S

OIL ____ °API @ ____ °F; Pour Point ____ °F

____ Colour; ____ Fluorescent Colour

____ G.O.R.

WATER Rrf ____ @ ____ °F, Equiv. Cl^- ____ ppm (Resistivity)

Cl^- 2000 ppm NO_3^- 180 ppm (Titration)

PRESSURES - MAIN CHAMBER

	Schlumberger	Amerada	Agnew Amerada	Hewlett Packard*
Sampling (psi)	1000	883		954 → 865
Final Shut-in (psi)		1949		-
Hydrostatic (psi)	2550	2497		2537.8
Sampling Time (Min)	21			
Shut-in Time (Min)	0			

(*Corrected for Atmospheric pressure)

TEMPERATURES : (max recorded) ____ °F, ____ °F

MAX. DEPTH TOOL REACHED: 4700 Ft.

TIME SINCE CIRCULATION : 28 Hrs.

REMARKS : Open tool and sample to main chamber for 21 minutes.
Open segregator after 21 minutes with main chamber full,
starting to build up. HP gauge failed after segregator opened.

F.I.T. SEGREGATOR REPORT

GEOLOGIST GILES

WELL : _____ F.I.T. No. 2 @ 4649 ft.(G.R. Depth) DATE 23/4/77

SEGREGATOR TYPE _____ NUMBER _____ DATE OPENED _____

RECOVERY - SEGREGATOR

_____ p.s.i. SURFACE PRESSURE _____ cc WATER

_____ cft. GAS _____ cc MUD

_____ cc. OIL _____ cc SAND

PROPERTIES - SEGREGATOR

GAS	C_1	C_2	C_3	C_4	C_5	H_2S

OIL _____ °API @ _____ °F; Pour Point _____ °F

_____ Colour; _____ Fluorescent Colour

_____ G.O.R.

WATER Rrf _____ @ _____ °F, Equiv. Cl^- _____ ppm (Resistivity)

Cl^- _____ ppm NO_3^- _____ ppm (Titration)

PRESSURES - SEGREGATOR

	Schlumberger	Amerada	Agnew Amerada	Hewlett Packard*
Sampling (psi)	50			30 → 150
Final Shut-in (psi)	2000			Tool failed
Hydrostatic (psi)	2550			
Sampling Time (Min)	1.5			
Shut-in Time (Min)	8			

(*Corrected for Atmospheric pressure)

REMARKS :

F.I.T. RECORD

GEOLOGIST S. GILES

WELL: BARRACOUTA-4 F.I.T. No. 3 @ 4646 ft. (G.R. Depth) DATE April 24, 1977

VALID TEST : Yes/~~No~~

FIRING METHOD Normal CHOKE SIZES 1 X 0.020"

TIMES : Tool Set 0121 Tool Open 0123 Min. Open 16 Full After 13

Shaped Charge Shot: ~~Yes~~/No at -

Segregator Open 0139 Mins. Open 13 Full After 0

Tool Closed 0152 Tool Off 0156

MUD DATA :

Rmf 0.74 @ 82 °F, Equiv. Cl^- 4100 ppm (Resistivity)

Cl^- 4000 ppm NO^-3 160 ppm (Titration)

SAMPLE TAKEN AT END OF LAST CIRCULATION

RECOVERY - MAIN CHAMBER

100 p.s.i. SURFACE PRESSURE	- cc WATER
4.1 cft. GAS	250 cc MUD
19,500 cc. OIL	Trace cc SAND

PROPERTIES - MAIN CHAMBER

GAS

C_1	C_2	C_3	C_4	C_5	C_6
132.0	28.8	60.2	42.3/41.0	15.6	2.9 M

OIL .63 °API @ 55 °F; Pour Point ____ °F

Brown Colour; Bl-wh Fluorescent Colour

33 G.O.R.

WATER Rrf ____ @ ____ °F, Equiv. Cl^- ____ ppm (Resistivity)

Cl^- ____ ppm NO_3^- ____ ppm (Titration)

PRESSURES - MAIN CHAMBER

	Schlumberger	Amerada	Agnew Amerada	Hewlett Packard*
Sampling (psi)	2050	1935		1948-1942
Final Shut-in (psi)		2009		2021
Hydrostatic (psi)	2530	2488		2512
Sampling Time (Min)	16 (13)			
Shut-in Time (Min)	(3)			

(*Corrected for Atmospheric pressure)

TEMPERATURES : (max recorded) 178 °F, 179 °F

MAX. DEPTH TOOL REACHED: 4700 Ft.

TIME SINCE CIRCULATION : 30 Hrs.

REMARKS : Successful oil test

F.I.T. SEGREGATOR REPORT

GEOLOGIST GILES

WELL : _____ F.I.T. No. 3 @ 4646 ft.(G.R. Depth) DATE 24/4/77

SEGREGATOR TYPE _____ NUMBER _____ DATE OPENED _____

RECOVERY - SEGREGATOR

_____ p.s.i. SURFACE PRESSURE _____ cc WATER

_____ cft. GAS _____ cc MUD

_____ cc. OIL _____ cc SAND

PROPERTIES - SEGREGATOR

GAS	C_1	C_2	C_3	C_4	C_5	H_2S

OIL _____ °API @ _____ °F; Pour Point _____ °F

_____ Colour; _____ Fluorescent Colour

_____ G.O.R.

WATER Rrf _____ @ _____ °F, Equiv. Cl^- _____ ppm (Resistivity)

Cl^- _____ ppm NO_3^- _____ ppm (Titration)

PRESSURES - SEGREGATOR

	Schlumberger	Agnew Amerada _____	Amerada _____	Hewlett Packard*
Sampling (psi)	2000			
Final Shut-in (psi)	2150			
Hydrostatic (psi)	2550			
Sampling Time (Min)	5 sec.			
Shut-in Time (Min)	17 min.			

(*Corrected for Atmospheric pressure)

REMARKS : Segregator retained unopened

APPENDIX 4(b)

REPEAT FORMATION TESTS

		Formation Pressure psi	Hydrostatic Pressure psi
Run 1			
RFT-1	4745'	2069 (Schl) 2065.4 (HP)	2646 (Schl) 2593.4 (HP)
RFT-2	4695'	2051 (Schl) 2046.5 (HP)	2571 (Schl) 2566.0 (HP)
RFT-3	4678'	2046 (Schl) 2040.7 (HP)	2561 (Schl) 2555.8 (HP)
RFT-4	4649'	2034 (Schl) 2028.2 (HP)	2545 (Schl) 2539.4 (HP)
RFT-5	4648'	2042 (Schl) 2027.9 (HP)	2546 (Schl) 2537.8 (HP)
RFT-6	4647'	2037 (Schl) 2027.0 (HP)	2545 (Schl) 2535.6 (HP)
RFT-7	4646'	2037 (Schl) 2027.0 (HP)	2546 (Schl) 2536.0 (HP)
RFT-8	4635'	2034 (Schl) 2023.2 (HP)	2544 (Schl) 2529.9 (HP)
Run 2			
RFT-9	4648'	2044 (Schl) 2015.7 (HP)	2550 (Schl) 2531.7 (HP)
Run 3			
RFT-10	4722'	tight test tight test	2554 (Schl) 2524.7 (HP)
RFT-11	4722'	2054 (Schl) 2032.7 (HP)	2557 (Schl) 2552.1 (HP)
RFT-12	4693'	2041 (Schl) 2034.0 (HP)	2534 (Schl) 2565.8 (HP)
RFT-13	4654'	seal failed	2511 (Schl) 2551.4 (HP)

		Formation Pressure psi	Hydrostatic Pressure psi
RFT-14	4655'		
		2025 (Schl)	2596 (Schl)
		2027.4 (HP)	2559.5 (HP)
RFT-15	4648.5'		
		2023 (Schl)	2586 (Schl)
		2025.9 (HP)	2562.0 (HP)
RFT-16	4634'		
		2022 (Schl)	2500 (Schl)
		2021.7 (HP)	2551.0 (HP)

Recoveries were attempted on RFT-5, 6, 7, 8, 9 & 16;
all failed due to flowline plugging.

APPENDIX V

APPENDIX 5

LOG ANALYSIS

M-1 Oil Reservoir

Interval		Porosity	Water Saturation	Remarks
4630.5-4647	(16.5)	26.8-28	16-17	Oil productive
4647-4656	(9)	28.3-29.5	71-74	Water productive
4669-4675	(6)	23.5-24.7	100	Slightly shaly
4675-4683	(8)	26.8-28	100	Water
4689-4703	(14)	24.7-25.9	100	Water

N-1 Gas Reservoir

Final log analysis for the N-1 Reservoir will be made available at a later date.

R.B. King

Log Analyst

APPENDIX VI

APPENDIX 6

VELOCITY SURVEY
BARRACOUTA-4

T.D. CURVE

SONIC CALIBRATION CURVE
AS ENCLOSURES

Well .... BARRACOUTA - 4 .....

Basin .... GIPPSLAND .....

INTRODUCTION

Esso personnel .... C. CARTY AND M. LYNN .....

Contractor .... VELOCITY DATA PTY. LTD. .....

Supplied (1) Instruments

(2) Personnel

Seismic Observer ..... B. POTTER

Marine Shooter ..... R. DOYLE

Dynamite ..... ----

(3) Seismic Souce

Gas Gun

Gas Pressures .. 2:1 Ratio ....

Oxygen ..... 90 PSI .....

Propane ..... 45 PSI .....

(3) Licenced Shooting Boat

name .....

date loaded .....

date released .....

Agent .....

.....

amount of powder ..... lbs

size of cans ..... lbs

number of cans .....

number of caps .....

number of boosters .....

Personnel and Instruments

assembled at . Melbourne ..... date .. 9.4.77 .....

boarded (rig) .. Ocean Endeavour ... date .. 10.4.77 .....

date of survey ... 12.4.77 .....

casing depth ... 3,147' K.B. (when shot)

T.D. when shot .. 4,240' K.B. ..... FTD 4,783' K.B.

water depth .... 153' K.B. 83' .....

SURVEY PROCEDURE

Weather: sea .... Slight .....

rig movement .... Slight .....

rig noise .... Considerable .....

Hydrophones: number .... Three .....

depth below sea level ..... 40 ..... ft

position .... 1 Moonpool .....

2 on Gas Gun .....

Shot Positioning and Charges:

marker buoys (number .....

(distance .....

(direction .....

charge depth ..... ft

number of shots ..... charge size ..... lbs.

number of shots ..... charge size ..... lbs.

number of misfires .....

amount of powder used ..... lbs

Gas gun

Number of pops per level .... Average 2 .....

amount of powder dumped .....lbs.

Well-phone positioning :

T-bar .....

number of depths .....28.....

Time: first shot ...06.05 hrs.....

last shot ....10.35 hrs.....

rig time .....5½ hrs.....

RESULTS

Quality of records (good ..40.....
(fair ..21.....
(poor ...3.....
(not used ..1.....

Comparison of Interval Times with sonic log

/Δ/average .....20.4....microsec/foot

/Δmax/ .....44.4....microsec/foot

CONCLUSION

Reliability of T-D curve .....good.....

COMMENTS:

The gas gun was positioned as usual between the aft and port side cassions using the port side crane. The first two shallowest depths (2,820' and 3,100' K.B.) were shot in casing at 0605 and 0613 hrs. The tool was then lowered to total depth (3,927' K.B.) and this level was shot at 0627 hrs. Successive levels were shot as the tool was brought out of the hole.

At various random depths, the noise level was considerable; possibly due to gas bubbling in the hole and formations.

Since the measurement error of the velocity tool is $\pm$ 1 millisec. and the checkshot interval is predominantly very small (e.g. 20') the error in microseconds per foot is notably large and large variations in interval velocity occur for small changes in checkshot interval times.

Shothole information:- Elevation, Distance & Direction from Well

Company: ESSO EXPLORATION AUSTRALIA INC.

Well: BARRACOUTA - 4

Elevation (Derrick Floor): 83'

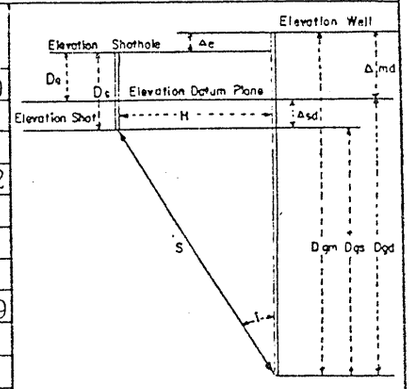
Total Depth: 4,783' (K.B.)

LOCATION

Coordinates: 38°17' 21.667"S 147°42' 4.015"E DATUM : M.S.L.

Section, Township, Range County Area or Field: GIPPSLAND BASIN, VICTORIA

Record Number	Shothole Number	Time of Shot	Dgm	Ds	tus	tr	T Reading	T Polarity	T Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
1		06.05	2820	40	.008	.030	.342	D	G	2697	150	.0556	.9985	.342	40	.008	.350	.350	2737				7820
2		06.06	2820	40	.008	.030	.342	D	G	2697	150	.0556	.9985	.342	40	.008	.350			280	.028	10000	
																							7982
3		06.13	3100	40	.008	.031	.370	D	G	Offset not significant							.378	.378	3017				
4		06.14	3100	40	.008	.030	.369	D	G								.377						
5		06.15	3100	40	.008	.031	.371	D	G								.379			130	.013	10000	
																							8049
64		10.34	3230	40	.008	.030	.383	D	G								.391	.391	3147				
65		10.35	3230	40	.008	.030	.383	D	G								.391			150	.020	7500	
																							8022
61		10.24	3380	40	.008	.030	.403	D	F								.411	.411	3297				
62		10.25	3380	40	.008	.031	.402	D	P								.410						
63		10.26	3380	40	.008	.031	.402	D	P								.410			72	.008	9000	
																							8041
58		10.04	3452	40	.008	.030	.411	D	G								.419	.419	3369				
59		10.05	3452	40	.008	.030	.411	D	F								.419						
60		10.06	3452	40	.008	.031	.411	D	F								.419			18	.003	6000	
																							8026
56		09.52	3470	40	.008	.031	.414	D	F								.422	.422	3387				
57		09.53	3470	40	.008	.031	.414	D	G								.422			20	.002	10000	
																							8035
52		09.34	3490	40	.008	.031	.415	D	F								.423	.424	3407				
53		09.35	3490	40	.008	.031	.416	D	F								.424			20	.002	10000	
																							8045
54		09.43	3510	40	.008	.031	.418	D	F								.426	.426	3427				
55		09.44	3510	40	.008	.031	.418	D	G								.426			20	.003	6667	
																							8035
50		09.16	3530	40	.008	.031	.421	D	G								.429	.429	3447				
51		09.17	3530	40	.008	.031	.421	D	G								.429			20	.002	10000	
																							8044
48		09.08	3550	40	.008	.031	.423	D	G								.431	.431	3467				
49		09.09	3550	40	.008	.031	.423	D	G								.431			20	.002	10000	
																							8053
46		08.59	3570	40	.008	.031	.425	D	G								.433	.433	3487				
47		09.00	3570	40	.008	.031	.425	D	G								.433			20	.001	20000	



Dgm = Geophone depth measured from well elevation

Dgs = " " " " shot "

Dgd = " " " " datum "

Ds = Depth of shot

De = Shothole elevation to datum plane

H = Horizontal distance from well to shotpoint

S = Straight line travel path from shot to well geophone

tus = Uphole time at shotpoint

T = Observed time from shotpoint to well geophone.

tr = " " " to reference geophone.

Δe = Difference in elevation between well & shotpoint.

Δsd = " " " " shot & datum plane

Δsd = Ds - De

Dgs = Dgm - Ds ± Δe ; $\tan i = \frac{H}{Dgs}$

Tgs = cos i T = Vert. travel time from shot elev. to geophone

Tgd = $Tgs \pm \frac{\Delta sd}{V}$ = " " " " datum plane " "

Dgd = Dgm - Δmd

Vi = Interval velocity = $\frac{\Delta Dgd}{\Delta Tgd}$

Va = Average = $\frac{Dgd}{Tgd}$

Surveyed by: Velocity Data P/L

Date: 12.4.77

Weathering Data:

Casing Record
3147' K.B.

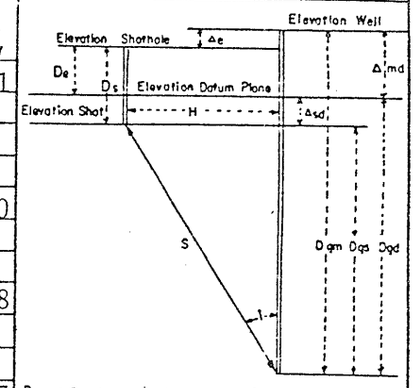
DWG. 1107/OP/3

Shothole information:- Elevation, Distance & Direction from Well

Company: ESSO EXPLORATION AUSTRALIA INC.
Well: BARRACOUTA - 4
Elevation (Derrick Floor): 83'
Total Depth:

LOCATION
Coordinates: 38°17' 21.667"S, 147°42' 4.016"E
Section, Township, Range / County / Area or Field: GIPPSLAND BASIN, VICTORIA
DATUM: M.S.L.

Record Number	Shothole Number	Time of Shot	Dgm	Ds	tus	tr	T Reading	T Polarity	T Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
43		08.49	3590	40	.008	.031	.427	D	F						40	.008	.435	.434	3507				
44		08.50	3590	40	.008	.031	.426	D	F								.434						8081
45		08.50	3590	40	.008	.030	.426	D	P								.434						
																				20	.002	10000	
41		08.40	3610	40	.008	.031	.428	D	G								.436	.436	3527				
42		08.41	3610	40	.008	.031	.428	D	G								.436						8090
																				20	.002	10000	
39		08.31	3630	40	.008	.031	.429	D	F								.437	.438	3547				
40		08.32	3630	40	.008	.031	.430	D	G								.438						8098
																				20	.002	10000	
37		08.23	3650	40	.008	.031	.432	D	G								.440	.440	3567				
38		08.24	3650	40	.008	.031	.432	D	F								.441						8107
																				20	.002	10000	
35		08.14	3670	40	.008	.030	.434	D	F								.442	.442	3587				
36		08.14	3670	40	.008	.030	.434	D	G								.442						8115
																				20	.002	10000	
32		08.03	3690	40	.008	.031	.436	D	G								.444	.444	3607				
33		08.04	3690	40	.008	.031	.436	D	G								.444						8124
34		08.05	3690	40	.008	.031	.437	D	F								.445						
																				20	.002	10000	
30		07.58	3710	40	.008	.031	.438	D	G								.446	.446	3627				
31		07.59	3710	40	.008	.031	.438	D	G								.446						8132
																				20	.003	6667	
28		07.47	3730	40	.008	.031	.441	D	F								.449	.449	3647				
29		07.48	3730	40	.008	.031	.441	D	G								.449						8123
																				20	.003	6667	
26		07.40	3750	40	.008	.031	.444	D	G								.452	.452	3667				
27		07.41	3750	40	.008	.030	.443	D	G								.451						8113
																				20	.002	10000	
24		07.33	3770	40	.008	.031	.446	D	G								.454	.454	3687				
25		07.34	3770	40	.008	.031	.445	D	F								.453						8121
																				20	.002	10000	
21		07.22	3790	40	.008	.031	.449	D	F								.457	.456	3707				
22		07.23	3790	40	.008	.031	.448	D	G								.456						8129
23		07.26	3790	40	.008	.031	.448	D	G								.456						
																				20	.002	10000	



Dgm = Geophone depth measured from well elevation
Dgs = " " " " shot "
Dgd = " " " " datum "
Ds = Depth of shot
De = Shothole elevation to datum plane
H = Horizontal distance from well to shotpoint
S = Straight line travel path from shot to well geophone
tus = Uphole time at shotpoint
T = Observed time from shotpoint to well geophone.
tr = " " to reference geophone.
Δe = Difference in elevation between well & shotpoint.
Δsd = " " " " shot & datum plane
Δsd = Ds - De
Dgs = Dgm - Ds ± Δe ; $\tan i = \frac{H}{Dgs}$
Tgs = cos i ; T = Vert. travel time from shot elev. to geophone
$Tgd = Tgs \pm \frac{\Delta sd}{V}$ = " " " " datum plane " "
Dgd = Dgm - Δmd
Vi = Interval velocity = $\frac{\Delta Dgd}{\Delta Tgd}$
Va = Average = $\frac{Dgd}{Tgd}$

Surveyed by: Velocity Data P/L
Date: 12.4.77
Weathering Data:

Casing Record
3,147' K.B.

DWG 1107/OP/3

Shothole information:- Elevation, Distance & Direction from Well

Company: ESSO EXPLORATION AUSTRALIA INC.

Well: BARRACOUTA - 4

Elevation (Derrick Floor): 83'

Total Depth:

LOCATION

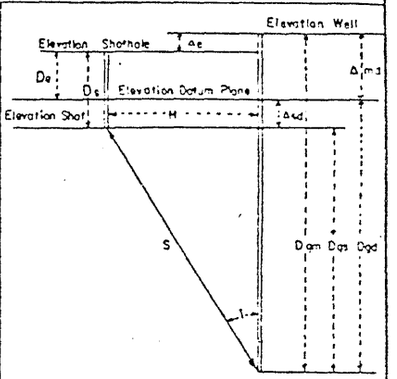
Coordinates: 38°17' 21.667"S, 147°42' 4.015"E

Section Township Range:

County Area or Field: GIPPSLAND BASIN, VICTORIA

DATUM: M.S.L.

Record Number	Shothole Number	Time of Shot	Dgm	Ds	tus	tr	T Reading	T Polarity	T Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
19		07.14	3810	40	.008	.031	.450	D	G								.458	.458	3727				8138
20		07.15	3810	40	.008	.031	.449	D	F								.457			20	.002	10000	
17		07.05	3830	40	.008	.031	.452	D	G								.460	.460	3747				8146
18		07.06	3830	40	.008	.031	.452	D	G								.460			20	.002	10000	
15		06.58	3850	40	.008	.031	.454	D	F								.462	.462	3767				8154
16		06.59	3850	40	.008	.031	.454	D	G								.462			10	.001	10000	
12		06.47	3860	40	.008	.031	.455	D	F								.463	.463	3777				8158
13		06.48	3860	40	.008	.031	.455	D	F								.463						
14		06.49	3860	40	.008	.030	.452	D	NU								.460			44	.006	7333	
9		06.38	3904	40	.008	.031	.461	D	G								.469	.469	3821				8147
10		06.39	3904	40	.008	.031	.461	D	G								.469						
11		06.40	3904	40	.008	.031	.461	D	G								.469			23	.003	7666	
6		06.27	3927	40	.008	.031	.464	D	G								.472	.472	3844				8144
7		06.28	3927	40	.008	.031	.465	D	F								.473						
8		06.29	3927	40	.008	.031	.464	D	G								.472						



Dgm = Geophone depth measured from well elevation

Dgs = " " " " shot "

Dgd = " " " " datum "

Ds = Depth of shot

De = Shothole elevation to datum plane

H = Horizontal distance from well to shotpoint

S = Straight line travel path from shot to well geophone

tus = Uphole time at shotpoint

T = Observed time from shotpoint to well geophone

tr = " " " to reference geophone

Δe = Difference in elevation between well & shotpoint.

Δsd = " " " " shot & datum plane

Δsd = Ds - De

Dgs = Dgm - Ds ± Δe, $\tan i = \frac{H}{D_{gs}}$

Tgs = cos i T = Vert. travel time from shot elev. to geophone

Tgd = $T_{gs} \pm \frac{\Delta sd}{V}$ = " " " " datum plane " "

Dgd = Dgm - Δmd

VI = Interval velocity = $\frac{\Delta D_{gs}}{\Delta T_{gs}}$

Va = Average = $\frac{D_{gs}}{T_{gs}}$

Surveyed by: Velocity Data P/L

Date: 12.4.77

Weathering Data:

Casing Record: 3,147' K.B.

DWG 1107/OP/3

VELOCITY SURVEY ERROR CHECK

[redacted]pth -S.L.	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	△ (Millisecs.) $T_{i\ Check} - T_{i\ Sonic}$	Depth Interval (ft.)	Error (Microsec per ft.)
2737	.350					
3017	.378	.028	.0367	- 8.7	280	31.1
3017	.378					
3147	.391	.013	.0122	+ 0.8	130	6.2
3147	.391					
3297	.411	.020	.0184	+ 1.6	150	10.7
3297	.411					
3369	.419	.008	.0083	- 0.3	72	4.2
3369	.419					
3387	.422	.003	.0022	+ 0.8	18	44.4
3387	.422					
3407	.424	.002	.0021	- 0.1	20	5.0
3407	.424					
3427	.426	.002	.0026	- 0.6	20	30.0
3427	.426					
3447	.429	.003	.0025	+ 0.5	20	25.0
3447	.429					
3467	.431	.002	.0023	- 0.3	20	15.0
3467	.431					
3487	.433	.002	.0015	+ 0.5	20	25.0
3487	.433					
3507	.434	.001	.0016	- 0.6	20	30.0
3507	.434					
3527	.436	.002	.0021	- 0.1	20	5.0
3527	.436					
3547	.438	.002	.0017	+ 0.3	20	15.0
3547	.438					
3567	.440	.002	.0024	- 0.4	20	20.0
3567	.440					
3587	.442	.002	.0022	- 0.2	20	10.0
3587	.442					
3607	.444	.002	.0024	- 0.4	20	20.0

VELOCITY SURVEY ERROR CHECK

epth el.S.L.	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	△ (Millisecs.) $T_{i\ Check} - T_{i\ Sonic}$	Depth Interval (ft.)	Error (Microsec per ft.)
3607	.444					
3627	.446	.002	.0024	- 0.4	20	20.0
3627	.446					
3647	.449	.003	.0024	+ 0.6	20	30.0
3647	.449					
3667	.452	.003	.0022	+ 0.8	20	40.0
3667	.452					
3687	.454	.002	.0024	- 0.4	20	20.0
3687	.454					
3707	.456	.002	.0023	- 0.3	20	15.0
3707	.456					
3727	.458	.002	.0022	- 0.2	20	10.0
3727	.458					
3747	.460	.002	.0023	- 0.3	20	15.0
3747	.460					
3767	.462	.002	.0024	- 0.4	20	20.0
3767	.462					
3777	.463	.001	.0013	- 0.3	10	30.0
3777	.463					
3821	.469	.006	.0046	+ 1.4	44	31.8
3821	.469					
3844	.472	.003	.0025	+ 0.5	23	21.7

Well BARRACOUTA-4

Basin ..... GIPPSLAND .....

INTRODUCTION

Esso personnel ... I.P. HAWKSHAW, A.B. MITCHELL .....

Contractor ..... VELOCITY DATA PTY. LTD. .....

Supplied (1) Instruments

(2) Personnel

Seismic Observer .. B. POTTER ....

Marine Shooter .... R. DOYLE .....

Dynamite .....

(3) Seismic Souce

Gas Gun

Gas Pressures .....

Oxygen ... 90 .....

Propane .. 45 .....

(3) Licenced Shooting Boat

name .....

date loaded .....

date released .....

Agent .....

.....

amount of powder ..... lbs

size of cans ..... lbs

number of cans .....

number of caps .....

number of boosters .....

Personnel and Instruments

assembled at LONGFORD ..... date 22/4/77 .....

boarded (rig) OCEAN ENDEAVOUR ... date 22/4/77 .....

date of survey 23/4/77 .....

casing depth ... 4241'KB .....

T.D. when shot 4783'KB ..... FTD ... 4783' .....

water depth ..... 153' .....

K.B. ..83'....

SURVEY PROCEDURE

Weather: sea ..... MODERATE .....

rig movement SLIGHT .....

rig noise .. MINIMAL .....

Hydrophones: number .. 3 (only 2 monitored) .....

depth below sea level .... 40 ..... ft

position .. 2 above gun .....

.. 1 in moonpool .....

Shot Positioning and Charges:

marker buoys (number .....

(distance .....

(direction .....

charge depth ..... ft

number of shots ..... charge size ..... lbs.

number of shots ..... charge size ..... lbs.

number of misfires .....

Gas gun amount of powder used ..... lbs

Number of pops per level: .. usually 2, maximum 4 .....

amount of powder dumped .....lbs.

Well-phone positioning :

T-bar .....

number of depths .....10.....

Time: first shot .....0055.....

last shot .....0228.....

rig time .....1 hour 33 minutes.....

RESULTS

Quality of records (good .....16.....
(fair .....3.....
(poor .....3.....
(not used ..1.....

Comparison of Interval Times with sonic log

/△/average .16.2.....microsec/foot

/△max/ .....42.5.....microsec/foot

CONCLUSION

Reliability of T-D curve .....GOOD.....

COMMENTS:

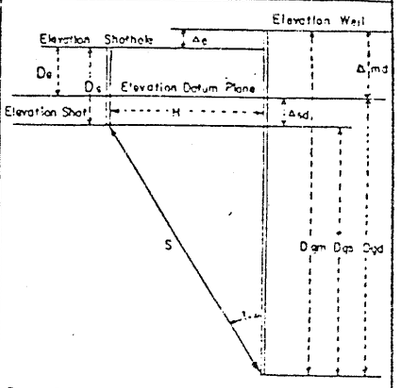
Very smooth survey. Shot 5 levels running in and 5 levels coming out. At 4150' (recs #3,4) very poor quality on one record so reshot coming out. Tool would not lock into casing so just let cable hold tool at level with the arm extended to force it against casing. One of these records is also very noisy and is not used.

One shot at 4050' (Rec # 18) had very strange noise so record is rated as VP but still gives reasonable pick on first break.

It should be noted that the vertical one way travel time at depth 3927'KB for the first survey is 0.472 secs., while for the second survey it is 0.470. This difference is acceptable as it is within the range of practical reproducibility for the different conditions of each survey (e.g., tides, casing, gun and well geophone positioning, etc.)

Shothole information:- Elevation, Distance & Direction from Well	Company	Well	Elevation (Derrick Floor)	Total Depth	LOCATION
	ESSO EXPLORATION AUSTRALIA INC.	BARRACOUTA-4	83'	4783' (KB)	Coordinates 38°17'22.789"S 147°42' 3.184"E; Section, Township, Range; County; Area or Field: GIPPSLAND BASIN, VICTORIA; DATUM : MSL

Record Number	Shothole Number	Time of Shot	Dgm	Ds	tus	tr	T Reading	T Polarity	T Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
1			3927	40	.008	.031	.461	D	F-G	3804	150	.0394	.9992	.461	40	.008	.469	.470	3844				8179
2			3927	"	"	.030	.462	"	G	"	"	"	"	.462	"	"	.470			43	.005	8600	
22			3970	"	"		.468	"	F-G	Offset not significant							.476	.475	3887				8183
23			3970	"	"		.466	"	F-G								.474			40	.004	1000	
20			4010	"	"		.471	"	G								.479	.479	3927				9198
21			4010	"	"		.470	"	G								.478			40	.006	6667	
18			4050	"	"		.478	"	VP								.486	.485	3967				8179
19			4050	"	"		.477	"	E								.485			100	.013	7692	
3			4150	"	"		.491	"	G								.499	.498	4067				8167
4			4150	"	"		.491	"	VP								.499						
16			4150	"	"		.488	"	F-G								.496			160	.020	8000	
17			4150	"	"		.484	"	NU								-						
5			4310	"	"		.510	"	F								.518	.518	4227				8160
6			4310	"	"		.509	"	G								.517			144	.013	11077	
13			4454	"	"		.522	"	F								.530	.531	4371				8232
14			4454	"	"		.523	"	F								.531						
15			4454	"	"		.523	"	P-F								.531			146	.016	9125	
7			4600	"	"		.538	"	F-G								.546	.547	4517				8258
8			4600	"	"		.540	"	F-G								.548			70	.006	11667	
11			4670	"	"		.544	"	F-G								.552	.553	4587				8295
12			4670	"	"		.545	"	F-G								.553			100	.009	1111	
9			4770		"		.554	"	F-G								.562	.562	4687				8340
10			4770		"		.554	"	F-G								.562						



Dgm = Geophone depth measured from well elevation
Dgs = " " " " shot "
Dgd = " " " " datum "
Ds = Depth of shot
De = Shothole elevation to datum plane
H = Horizontal distance from well to shotpoint
S = Straight line travel path from shot to well geophone
tus = Uphole time at shotpoint
T = Observed time from shotpoint to well geophone
tr = " " to reference geophone
Δe = Difference in elevation between well & shotpoint.
Δsd = " " " " shot & datum plane
Δsd = Ds - De
Dgs = Dgm - Ds ± Δe, $\tan i = \frac{H}{Dgs}$
Tgs = cos i T = Vert. travel time from shot elev to geophone
Tgd = $Tgs \pm \frac{\Delta sd}{V}$ = " " " " datum plane " "
Dgd = Dgm - Δmd
Vi = Interval velocity = $\frac{\Delta Dgd}{\Delta Tgd}$
Va = Average = $\frac{Dgs}{Tgs}$

Surveyed by: I.Hawkshaw, A.Mitchel
Date: 23/4/77
Weathering Data:

Casing Record
4241'KB

DWG. 1107/OP/3

VELOCITY SURVEY ERROR CHECK

Depth e1.S.L.	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	Δ (Millisecs.) $T_{i\,Check} - T_{i\,Sonic}$	Depth Interval (ft.)	Error (Microsec per ft.)
3844	.470		.0043			
387	.475	.005		+0.2	43	4.7
3887	.475		.0031			
927	.479	.004	(estimated)	-0.5	40	12.5
927	.479		.0043			
3967	.485	.006	(estimated)	+1.0	40	25.0
967	.485		.0145			
4067	.498	.013	(estimated)	-1.5	100	15.0
067	.498		.0185			
[redacted]27	.518	.020	(estimated)	+5.5	160	34.4
4227	.518					
[redacted]71	.531	.013	.0137	-0.7	144	4.9
4371	.531					
[redacted]17	.547	.016	.0143	+1.7	146	11.6
[redacted]17	.547					
4587	.553	.006	.0074	-1.4	70	20.0
[redacted]87	.553					
[redacted]87	.562	.009	.0094	-0.4	100	4.0
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						

BARRACOUTA-4

DATA USED IN CALIBRATION CURVE

Depth(ft) Rel.K.B.	Depth(ft) Rel.MSL	Time(secs) Sonic Log	Time(secs) Checkshots	ΔT(msecs) =T_L-Tcs	ΔD(ft) Depth Interval	ΔT(sec) Time Interval	Interval Velocity
2820	2737	.3434	.350	-6.6			
3100	3017	.3801	.378	+2.1			
3230	3147	.3923	.391	+1.3	632	.069	9159
3380	3297	.4107	.411	-0.3			
3452	3369	.4190	.419	0.0			
3470	3387	.4212	.422	-0.8			
3490	3407	.4233	.424	-0.7			
3510	3427	.4259	.426	-0.1			
3530	3447	.4284	.429	-0.6			
3550	3467	.4307	.431	-0.3			
3570	3487	.4322	.433	-0.8			
3590	3507	.4338	.434	-0.2			
3610	3527	.4359	.436	-0.1			
3630	3547	.4376	.438	-0.4			
3650	3567	.4400	.440	0.0			
3670	3587	.4422	.442	+0.2	408	.044	9273
3690	3607	.4446	.444	+0.6			
3710	3627	.4470	.446	+0.4			
3730	3647	.4494	.449	+0.4			
3750	3667	.4516	.452	-0.4			
3770	3687	.4540	.454	0.0			
3790	3707	.4563	.456	+0.3			
3810	3727	.4585	.458	+0.5			
3830	3747	.4608	.460	+0.8			
3850	3767	.4632	.462	+1.2			
3860	3777	.4645	.463	+1.5			
3904	3821	.4691	.469	+0.1			
3927	3844	.4716	.471	+0.6			
3970	3887	.4759	.475	+0.9	290	.035	8286
4010	3927	.4790	.479	0.0			
4050	3967	.4833	.485	-1.7			
4150	4067	.4978	.498	-0.2			
4310	4227	.5163	.518	-1.7	450	.049	9184
4454	4371	.5300	.531	-1.0			
4600	4517	.5443	.547	-2.7			
4670	4587	.5517	.553	-1.3	170	.015	11333
4770	4687	.5611	.562	-0.9			

BARRACOUTA – 4

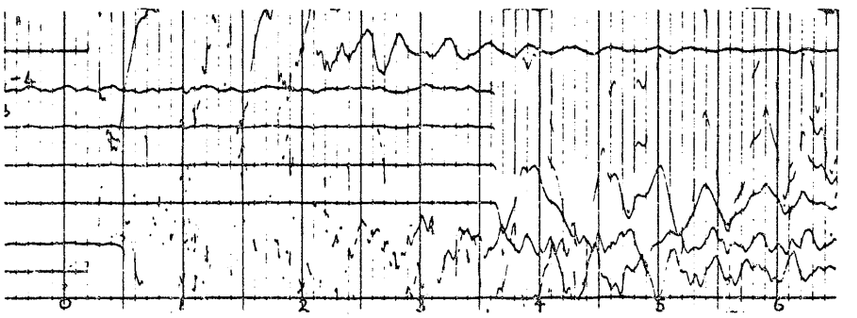
WELL VELOCITY RECORD

12 – 4 – 1977

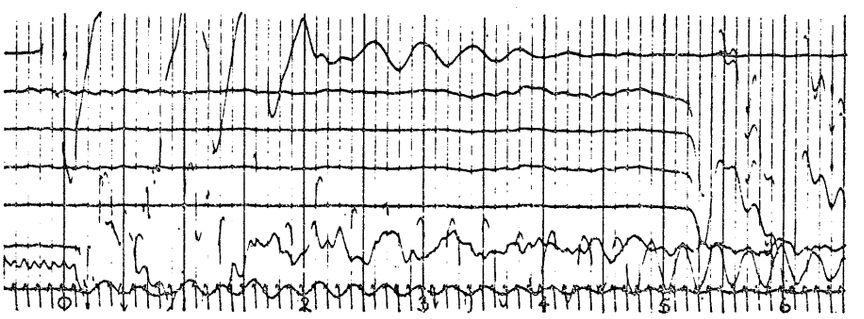
&

23 – 4 – 1977

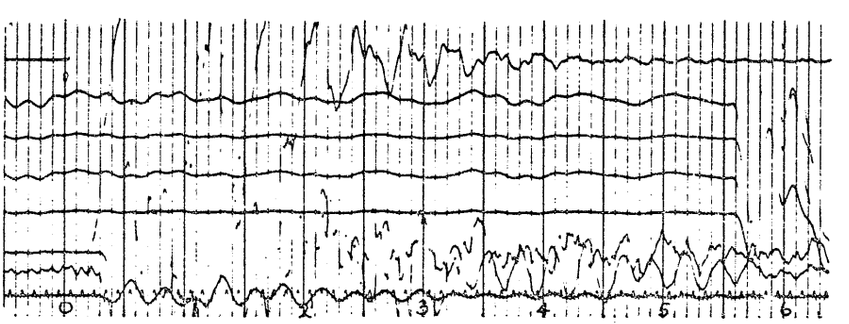
Rec. No. 2
2820' K.B.
T 0606 hrs.
10 sec. fill



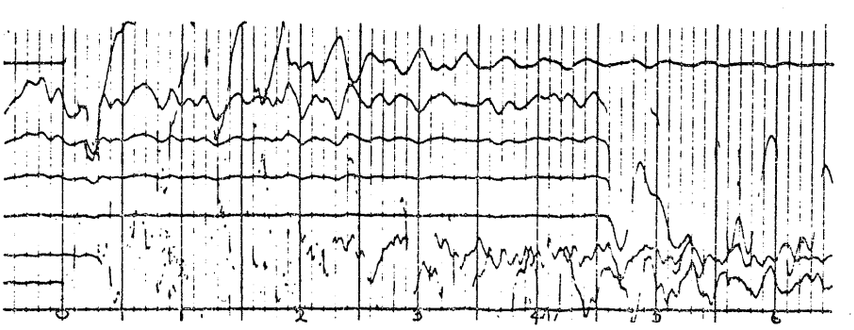
Rec. No. 8
4600' K B.
T 0121 hrs.
15 sec. fill



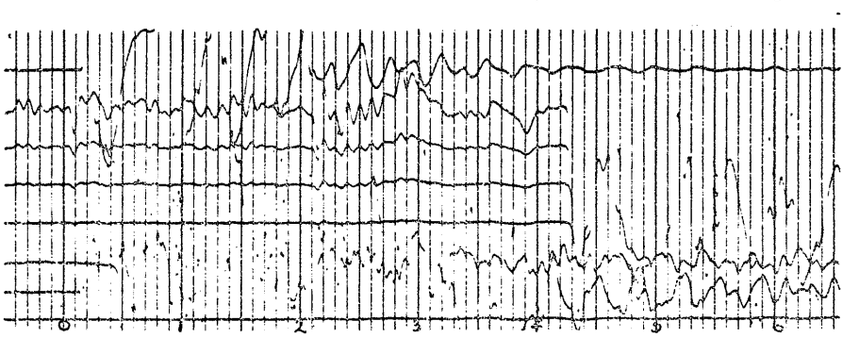
Rec. No. 9
4770' K.B.
T 0129 hrs.
15 sec. fill



Rec. No. 12
3860' K.B.
T 0647 hrs.
10 sec. fill



Rec. No. 58
3452' K.B.
T 1004 hrs
10 sec. fill



1960/22/2

VELOCITY DATA PTY. LTD.

PO. Box 141, Kenmore, Queensland, 4069
Telephone (072) 78 4860 (Office)
(072) 93 1514 (Field Operations)

DATE OF SURVEY 12 April 77

CLIENT Esso.

WELL Barracuda 4.

OBSERVERS REPORT

PAGE 1 of 2

ENERGY SOURCE Gas Gun. RECORDING INSTRUMENTS RS44 LOGGER Schlumberger.
GEOPHONES: WELL WLS 1000 REFERENCE Pressure SEA FLOOR 153' REFRACTION
REFERENCE SENSOR OFFSET 8' DEPTH 40' DRILL SHIP Ocean Endeavour SHIP HEADING 140° Tr.
WEATHER Cold, Mod. Wind SEAS Moderate

SHOT DEPTH	REC BEARING	CHARGE	SHOT DEPTH	SHOT LOCATION	SHOT OFFSET	AMPLIFIER GAIN	Atten.	TIME	COMMENTS
3[illegible]0.	1	10Sec.	40'	*	150	2/1	-10	0602	
	2	"					"	0603	
[illegible]0	3	10.	"	"	"	"	-5	0611	
	4	"					"	0612	
	5	"					"	0613	
[illegible]7	6	10	"	"	"	"	-10	0625	
	7	"					"	0626	
	8	"					"	0627	
[illegible]04	9	10	"	"	"	"	-5	0635	
	10	"					"	0636	
	11	"					"	0637	
[illegible]60	12	10	"	"	"	"	-5	0645	
	13	"					"	0646	
	14	"					"	0647	
[illegible]850	15	10	"	"	"	"	-5	0655	
	16	"					"	0656	
[illegible]830	17	10	"	"	"	"	-5	0702	
	18	"					"	0703	
3810	19	10	"	"	"	"	-5	0709	
	20	"					"	0710	
[illegible]790	21	10	"	"	"	"	-5	0722	
	22	"					"	0723	
	23	"					"	0724	
[illegible]770	24	10	"	"	"	"	-5	0731	
	25	"					"	0732	
[illegible]750	26	10	"	"	"	"	-5	0738	
	27	"					"	0739	
[illegible]730	28	10	"	"	"	"	-5	0747	
	29	"					"	0748	
3710	30	10	"	"	"	"	-5	0753	
	31	"					"	0754	
[illegible]690	32	10	"	"	"	"	-5	0800	
	33	"					"	0801	
	34	"					"	0802	
[illegible]670	35	10	"	"	"	"	-5	0809	
	36	"					"	0810	
[illegible]650	37	10	"	"	"	"	-5	0819	
	38	"					"	0820	
3630	39	10	"	"	"	"	-5	0827	
	40	"					"	0828	
[illegible]610	41	10	"	"	"	"	-5	0836	
	42	"					"	0837	

NUMBER OF RECORDS Perth 5th Apr. 77 EXPLOSIVES USED: CAPS Perth PRIMERS EXPLOSIVE
DEPART BRISBANE 5th Apr. 77 RETURN BRISBANE 13 Apr 77 OBSERVER B. K. Father

* From Port crane, midway between aft & port Caison

VELOCITY DATA PTY. LTD.
P.O. Box 141, Kenmore, Queensland, 4069
Telephone (072) 78 4860 (Office)
(072) 93 1514 (Field Operations)

DATE OF SURVEY 12 16 April 19

CLIENT

WELL Barracuta #4

PAGE 2

OBSERVERS REPORT

ENERGY SOURCE _____ RECORDING INSTRUMENTS _____ LOGGER _____

GEOPHONES: WELL _____ REFERENCE _____ SEA FLOOR _____ REFRACTION _____

REFERENCE SENSOR OFFSET _____ DEPTH _____ DRILL SHIP _____ SHIP HEADING _____

WEATHER _____ SEAS _____

KB DEPTH	Rec BEARING	CHARGE	SHOT DEPTH	SHOT LOCATION	SHOT OFFSET	AMPLIFIER GAIN	atten	TIME	COMMENTS
290	43	10sec	40'	*	150'	2/1	-5	0851	
	44	"						0852	
	45	"						0853	
370	46	15	"	"	"	"	-10	0858	
	47	10					-5	0859	
430	48	10	"	"	"	"	-5	0907	
	49	"						0908	
530	50	10	"	"	"	"	-5	0916	
	51	"						0917	
790	52	10	"	"	"	"	-5	0932	
	53	"						0933	
810	54	10	"	"	"	"	-5	0938	
	55	"						0939	
870	56	10	"	"	"	"	-5	0949	
	57	"						0950	
952	58	10	"	"	"	"	-5	1001	
	59	"						1002	
	60	"						1003	
380	61	15	"	"	"	"	-10	1020	} Very heavy noise despite change of Heck in position
	62	15					-10	1021	
	63	15					-10	1022	
230	64	10	"	"	"	"	-5	1030	
	65	10					-5	1031	

NUMBER OF RECORDS _____ EXPLOSIVES USED: CAPS _____ PRIMERS _____ EXPLOSIVE _____

DEPART BRISBANE _____ RETURN BRISBANE _____ OBSERVER _____

VELOCITY
DATA PTY. LTD.
P.O. Box 141, Kenmore, Queensland 4069
Telephone (072) 78 4860 (Office)
(072) 93 1514 (Field Operations)

DATE OF SURVEY 23 April 77.

CLIENT ESSO.

WELL BARRACOUDA # A.
RUN 2

OBSERVERS REPORT

ENERGY SOURCE Gas Gun. RECORDING INSTRUMENTS RS44. LOGGER Schlomberger.
GEOPHONES: WELL WLS 10-00 REFERENCE Pressure. SEA FLOOR 153' REFRACTION
REFERENCE SENSOR OFFSET ~~150~~ 10' DEPTH 40' DRILL SHIP Ocean Endeavour SHIP HEADING 140° T.
WEATHER Fine & Cold. SEAS Mild

B DEPTH	Record ~~BEARING~~	CHARGE	SHOT DEPTH	SHOT LOCATION	SHOT OFFSET	AMPLIFIER GAIN	gain.	TIME	COMMENTS
3927	1	15 Sec	40'	#	150'	2/1	-5	0053	
	2	10	"		"	"	"	0055	
4150	3	10	"		"	"	"	0101	
	4	10	"		"	"	"	0103	heavy noise
4310	5	10	"		"	"	"	0111	
	6	10	"		"	"	"	0112	
4100	7	15	"		"	"	0	0120	
	8	15	"		"	"	"	0121	
4770	9	15	"		"	"	"	0129	
	10	15	"		"	"	"	0130	
4670	11	15	"		"	"	"	0137	
	12	15	"		"	"	"	0138	
4484	13	15	"		"	"	"	0147	
	14	15	"		"	"	"	0148	
	15	15	"		"	"	"	0149	
4150	16	15	"		"	"	-5	0201	No slack on cable, tool slipping
	17	15	"		"	"	"	0202	
4050	18	15	"		"	"	"	0208	heavy noise
	19	15	"		"	"	"	0209	
4010	20	15	"		"	"	"	0217	
	21	15	"		"	"	"	0218	
3970	22	15	"		"	"	"	0227	
	23	15	"		"	"	"	0228	
		Clear of hole						0250	

Note - Amplified T/B traces replaced by Ocean floor package. - approx 50' offset from gas gun.
Suspended from port crane, mid way between aft & port caisson

NUMBER OF RECORDS 23 EXPLOSIVES USED: CAPS PRIMERS EXPLOSIVE
DEPART BRISBANE 22 April 77 RETURN BRISBANE 23 April 77 OBSERVER B.K. Potter.
Perth Perth.

APPENDIX

VII

APPENDIX 7

FORAMINIFERAL SEQUENCE
BARRACOUTA #4

FORAMINIFERAL SEQUENCE

BARRACOUTA # 4

by DAVID TAYLOR
Consultant

Esso Australia Ltd.
Paleontology Report 1977/14 May 12, 1977

SUMMARY

Barracouta # 4 is an anomalous sequence when compared with the other Barracouta sequences. This was because of differences in energy conditions which caused the inversion of the biostratigraphic sequence in Oligocene and early Miocene times and prolonged canyon fill sedimentation during the mid to late Miocene.

INTRODUCTION

Sixty-one side-wall cores were examined from BARRACOUTA # 4. No conventional cores or rotary cuttings were examined. All depths cited in this report and on accompanying sheets are in feet as labelled on side-wall core jars.

The following sheets accompany this report:-

Distribution Chart Sheet 1 - showing distribution of planktonic foraminifera and the basis of biostratigraphic zonation.

Distribution Chart Sheet 2 - giving distribution of benthonic foraminifera.

Distribution Chart Sheet 3 - summarising the environmental analysis.

Biostratigraphic Data Sheet

Two Sample Data Sheets - tabulation of zonation and quality of individual samples.

Biostratigraphic data sheets for Barracouta # 1, # 2 and # 3 have not been revised despite the difficulty in correlating them with Barracouta # 4 (refer conclusions in this report).

BIOSTRATIGRAPHY

No foraminifera were found in the "greensand" interval at or below 3430.

EARLY OLIGOCENE - 3412 to 3386:- The presence of *Subbotina angiporoides* associated with *Globigerina angiporoides* is indicative of Zone J, but the low diversity of the planktonic fauna precludes distinction between Zones J-2 and J-1.

LATE OLIGOCENE to EARLY MIOCENE - 3323 to 3181:- The sequence of faunal events in this interval are abnormal when compared with other sequences on the Barracouta structure. Also they are not in the order of sequence recorded elsewhere in the Gippsland Basin, apart from Trevally # 1, nor for that matter in New Zealand.
The sequence of events, in ascending order was:-

Depth	Faunal events	Zone	Epoch
3181	*Globigerinoides bisphericus & Praeorgulina glomerosa curva*	E-2	early Miocene
3200	*Globigerina woodi woodi* without *G. woodi connecta*	H-2	late Oligocene
3214	*Globigerinoides bisphericus & G. trilobus*	F	early Miocene
3272	*Globigerina euapertura & Globorotalia opima opima*	I-1	late Oligocene
3323	*G. euapertura*	?I-1	late Oligocene

The major abnormality is the reversal of the order of appearance of Zones H-2 and F. Despite the sample gap between 3272 and 3214, it is probable that Zones H-1 and G are absent. It is believed that this disturbance of the sequence was due to post depositional slumping associated with canyon cutting and not due to faulting (see other sections of this report).
The transition from early Miocene (Zone E-2) to mid Miocene (Zone E-1) appears to have been normal, with the easily recognisable E-2 association present at 3181.

MID MIOCENE - 3181 to 2088:- The base of the mid Miocene was marked by a diverse E-1 fauna at 3181. The quality of faunas above this vary with no fauna found at 3100. The fauna at 2930 definitely represents Zone E-1, but low confidence is placed on the apparent top of Zone E-1 at 2762.
As for E-1, the interval assigned to Zone D-2 varies in diversity and numerical frequency of planktonic faunas. Only samples at 2706 and 2520 contain the characteristic association of *Globorotalia peripheroronda* and *G. conica* with *Orbulina universa*.
The lack of complete and characteristic assemblages also reduces the reliability of intervals assigned to Zones D-1 and C. The abbreviation of the Zone D-1 interval, compared with that of Zone D-2, is abnormal and environmental conditions were probably responsible. Usually, the Zone D-1 intervals were the thickest in the Gippsland sequences.
The top of Zone C and the top of the mid Miocene was not well marked and has been placed at the sample immediately below the first appearances of Zone B-2 species.

LATE MIOCENE - 2050 to 1668 to ? :- The base of the late Miocene and the base of Zone B-2 have been taken at the initial appearance of *Globorotalia acostaensis* and *G. miotumida miotumida*. *G. acostaensis* does not extend above 2050, whilst *G. miotumida miotumida* occurs sporadically, with its highest appearance at 1668. In the absence of *G. miotumida conomiozea* the fauna at

1668 is regarded as being within Zone B-2. This may not be the top of the zone and the top of the late Miocene, as the faunas above are biostratigraphically non-diagnostic. Thus the Mio/Pliocene boundary cannot be designated in Barracouta # 4, especially as *G. miotumida conomiozea* was not present in the sequence.

PLIOCENE:- As for the rest of the Barracouta sequences, no definite Pliocene species were recorded in Barracouta # 4. The inability to identify the Pliocene was a function of the environmental conditions which restricted the planktonic diversity to four biostratigraphically ubiquitous species and does not imply that Pliocene sediment was absent from the four Barracouta sequences. The benthonic fauna in the interval between 1632 and 1029 was typical of that of the Pliocene in other Gippsland offshore wells and onshore Gippsland sections.

PLEISTOCENE - ? to 758 to ? :- The bounds of the Pleistocene could not be established, but the presence of *Globorotalia tosaensis* and *Globoquadrina dutertrei* at 758 suggests that the base of the Pleistocene is just below 758 which was assigned to Zone A-2.

ENVIRONMENT

Data relating to this interpretation is tabulated on Distribution Chart Sheets 2 and 3.

There is a conspicuous absence of deep water benthonic species in the sequence which, for the most part, is dominated by *Cibicides* spp. The percentage of planktonic specimens in the fauna was never consistently high and very few numerically rich and specifically diverse faunas were encountered. The whole faunal aspect suggests that the entire marine sequence was deposited on the continental shelf.

At first the early Oligocene benthonic faunas were dominated by arenaceous species which were gradually replaced in dominance by *Cibicides* spp. The percentage of planktonic specimens was at first extremely low but increased towards the top of the Oligocene. The trend is interpreted as that of subsidence of the continental shelf from a fairly shallow depth.

In the biostratigraphically confused section between 3272 and 3181, the faunal constituents (both qualitatively and quantitatively) indicate an outer

continental shelf environment in the proximity of the shelf/slope break as is evident by the presence of *Euuvigerina mayni* and *Siphouvigerina proboscidae* at 3214. The reversal of the sequence (i.e. Zone H-2 on top of Zone F) can be explained in terms of slumping at the shelf edge. This was a prelude to canyon cutting, as is demonstrated by the presence of proximal canyon fill sediment at and above 3164.

The calcarenites between 3164 and 2654 were often dominated by highly worn bryozoal fragments and contain worn specimens of shallow water benthonic foraminifera such as *Amphistegina lessonii*. Numerically the faunas were poor and benthonic diversity low, though often the planktonic component registered a high percentage. The quartz sandstones in this interval appear to have been devoid of fauna, including bryozoa. Obviously this was a stressed environment with shallow water skeletal detritus contributing to most, if not all, of the benthonic elements in the faunas. A canyon head situation at or near the shelf edge is postulated. The canyon filling commenced in Zone E-1. As this was closely preceded by a Zone E-2 sample (15 feet between samples), there is little evidence of a time lapse between canyon cutting and canyon filling. It is noted that Zones E-2 and E-1 combined, represent less than 1 m.y. on the radiometric time scale.

The termination of this phase of high energy sedimentation was marked by a rich and diverse benthonic fauna at 2608 in the Zone D-2 interval. Although this sample was dominated by *Cibicides* spp., there was a high proportion of Buliminacea (e.g. *Brizalina* spp. and *Euuvigerina* spp.). This gross faunal combination lives today on the outer southeastern portion of the Gippsland continental shelf.

Above 2608 energy conditions fluctuated as is demonstrated by the erratic variation in specimen frequency and diversity. Planktonic specimens dominated the fauna and sponge spicules were common. Thus this fine-grained micritic limestone interval between 2560 and 2218 has the characteristic of canyon fill sediment beyond the proximal position. However, it does not contain any continental slope foraminifera and the shelf forms present are not worn. The explanation is that sedimentation was still in the canyon head, but that supply of detrital material and/or energy was dissipated.

A diverse benthonic fauna was present between 2117 and 2000, suggesting normal outer shelf conditions. This was disrupted at 1900 (Zone B-2) by another phase of fluctuating energy conditions, terminating with the deposition of skeletal

calcarenites, dominated by worn bryozoal fragments. In part, this could be canyon head facies, but could also be mid to inner continental shelf situations with strong bottom currents.

The fauna in the highest sample (at 758) was indicative of the inner continental shelf and has many of the components of the onshore Jemmy Point and Tambo River Formations. As this sample is Pleistocene, there is further evidence of a late Cainozoic regression in the Gippsland Basin.

CONCLUSIONS

Correlation of Barracouta # 4 with the other Barracouta wells appears difficult and confusing. For instance:-

1) The presence of Zone F which was absent in the other wells.
2) The probable absence of Zones H-1 and G.
3) The inversion of Zone H-2 and F.
4) Thickness variations of Zones E to B.

These biostratigraphic abnormalities can be explained by the fact that environmental conditions which affected sedimentation in Barracouta # 4 were different to those which prevailed in the other three sequences. For instance:-

1) The Oligocene and early Miocene sediments, though partially removed, were not disturbed in the other three wells.
2) There appears to have been longer periods of high energy and canyon fill sedimentation in Barracouta # 4.

These factors would suggest that canyon cutting was more extensive and thus canyon filling more prolonged at Barracouta # 4. It would follow that Barracouta # 4 was in a more distal position in the canyon system that the other Barracouta wells. This would have resulted in marked differences in sedimentation rates between the sequences.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO: BARRACOUTA # 4 *DATE:* 11.5.77

PREPARED BY: DAVID TAYLOR *SHEET NO:* 1 of 2

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*
758	SWC 60		A-2 (1)
929	SWC 30		No planktonics
1042	SWC 29		indeterminate
1088	SWC 59		"
1138	SWC 58		"
1181	SWC 28		"
1252	SWC 57		"
1320	SWC 56		"
1362	SWC 55		"
1405	SWC 54		"
1452	SWC 53		B (2)
1493	SWC 52		No planktonics
1533	SWC 51		indeterminate
1576	SWC 50		"
1600	SWC 49		"
1632	SWC 48		"
1668	SWC 47		B-2
1715	SWC 46		indeterminate
1764	SWC 45		"
1816	SWC 44		"
1860	SWC 43		"
1900	SWC 42		B-2 (1)
2000	SWC 40		B-2 (1)
2050	SWC 39		B-2 (0)
2088	SWC 38		C (1)
2117	SWC 37		C (1)
2218	SWC 35		indeterminate
2260	SWC 27		"
2300	SWC 26		C (1)
2341	SWC 25		C (1)
2395	SWC 24		C (1)

MICROPALEONTOLOGICAL MATERIAL

11.5.77

WELL NAME AND NO: BARRACOUTA # 4 *DATE:* ~~XXXXXXXXX~~

PREPARED BY: DAVID TAYLOR *SHEET NO:* 2 of 2

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*
2435	SWC 23		D-1 (1)
2480	SWC 22		D-1 (1)
2520	SWC 21		D-2 (0)
2566	SWC 20		D-2 (1)
2608	SWC 19		D-2 (1)
2654	SWC 18		D-2 (2)
2663	SWC 17		indeterminate
2706	SWC 16		Base D-2 (1)
2730	SWC 34		No planktonics
2762	SWC 15		E-1 (2)
2803	SWC 14		No planktonics
2930	SWC 32		E-1 (0)
3100	SWC 6		N.F.F.
3120	SWC 5		E-1 (1)
3140	SWC 4		No planktonics
3164	SWC 3		E-1 (2)
3181	SWC 2		E-2 (0)
3200	SWC 1		H-2 (1)
3214	SWC 90		F (0)
3272	SWC 89		I-1 (1)
3323	SWC 88		I-1 (2)
3377	SWC 87		indeterminate
3386	SWC 86		J-1 (2)
3400	SWC 85		No planktonics
3412	SWC 84		J-1 (2)
3430	SWC 83		N.F.F.
3438	SWC 82		N.F.F.
3443	SWC 81		N.F.F.
3447	SWC 80		N.F.F.
3450	SWC 79		N.F.F.

N.F.F. = No foraminifera found

Form R 193 3/71

BASIN GIPPSLAND BY David Taylor

WELL NAME BARRACOUTA #4 DATE 11-5-77 ELEV. +83'

Foram Zonules

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
	A	758	1		758	1	
	Alternate						
	B	1452	2		2050	0	
	Alternate						
MIOCENE	C	2088	1		2395	1	
	Alternate						
	D_1	2435	1		2480	1	
	Alternate						
	D_2	2520	0		2706*	1	
	Alternate						
	E	2762	2		3181*	0	
	Alternate	2930	0				
	F	3214	0		3214	0	
	Alternate						
	G						
	Alternate						
	H_1						
	Alternate						
	H_2	3200	1		3200	1	
	Alternate						
OLIGOCENE	I_1	3272	1		3323	2	
	Alternate						
	I_2						
	Alternate						
	J_1	3386	2		3412	2	
	Alternate						
	J_2						
	Alternate						
EOC.	K						
	Alternate						
	Pre K						

* right on zonal change

COMMENTS: Sequence is anomalous when compared with Barracouta #1, #2, and #3. This is because of slumping, canyon cutting and greater thickness of proximal canyon fill. N.B. reversal of H-2 and F and probable absence of H-1 and G. Refer paleontology report 1977/14.

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

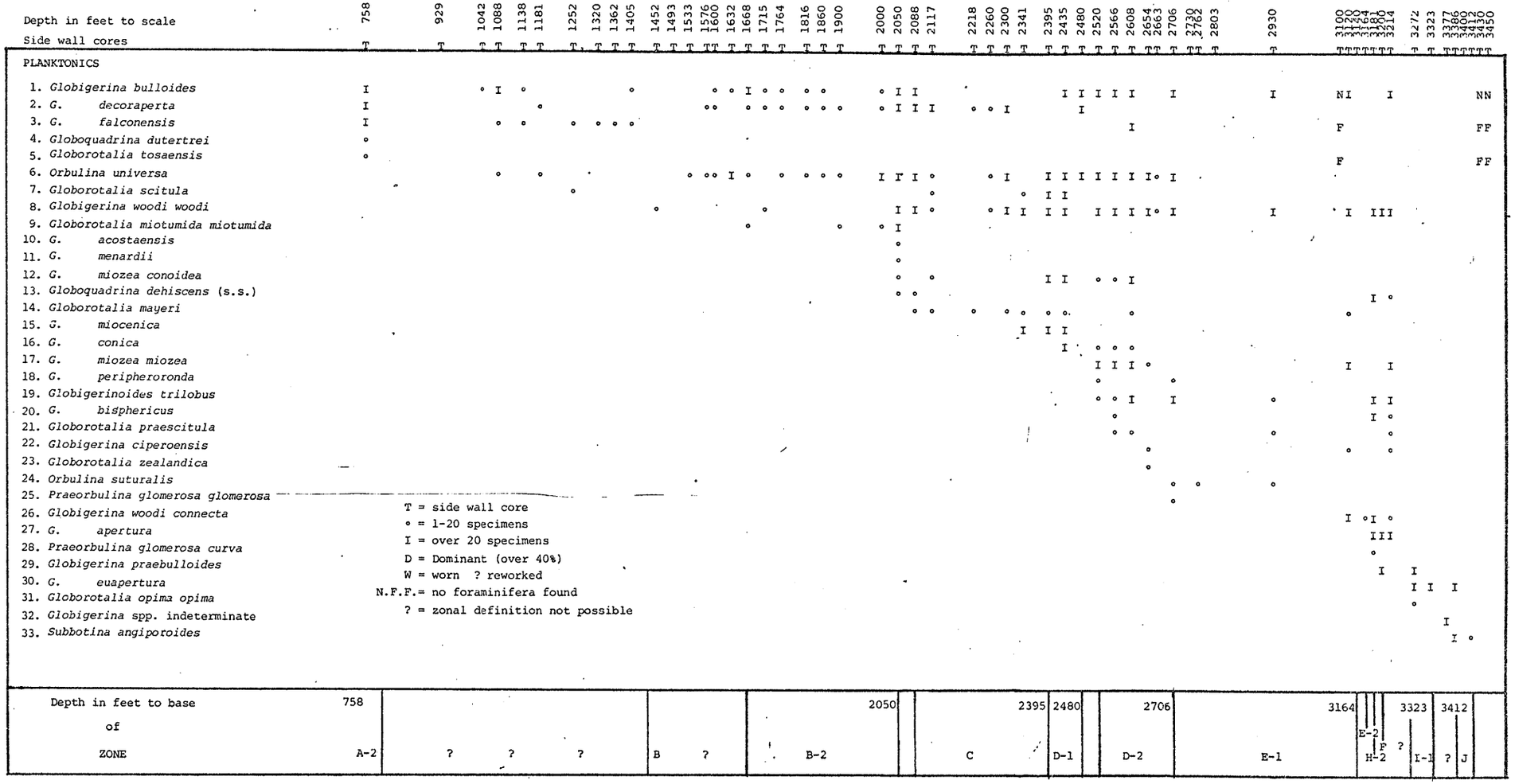
If a sample cannot be interpreted to be one zonule, as apart from the other, no entry should be made.

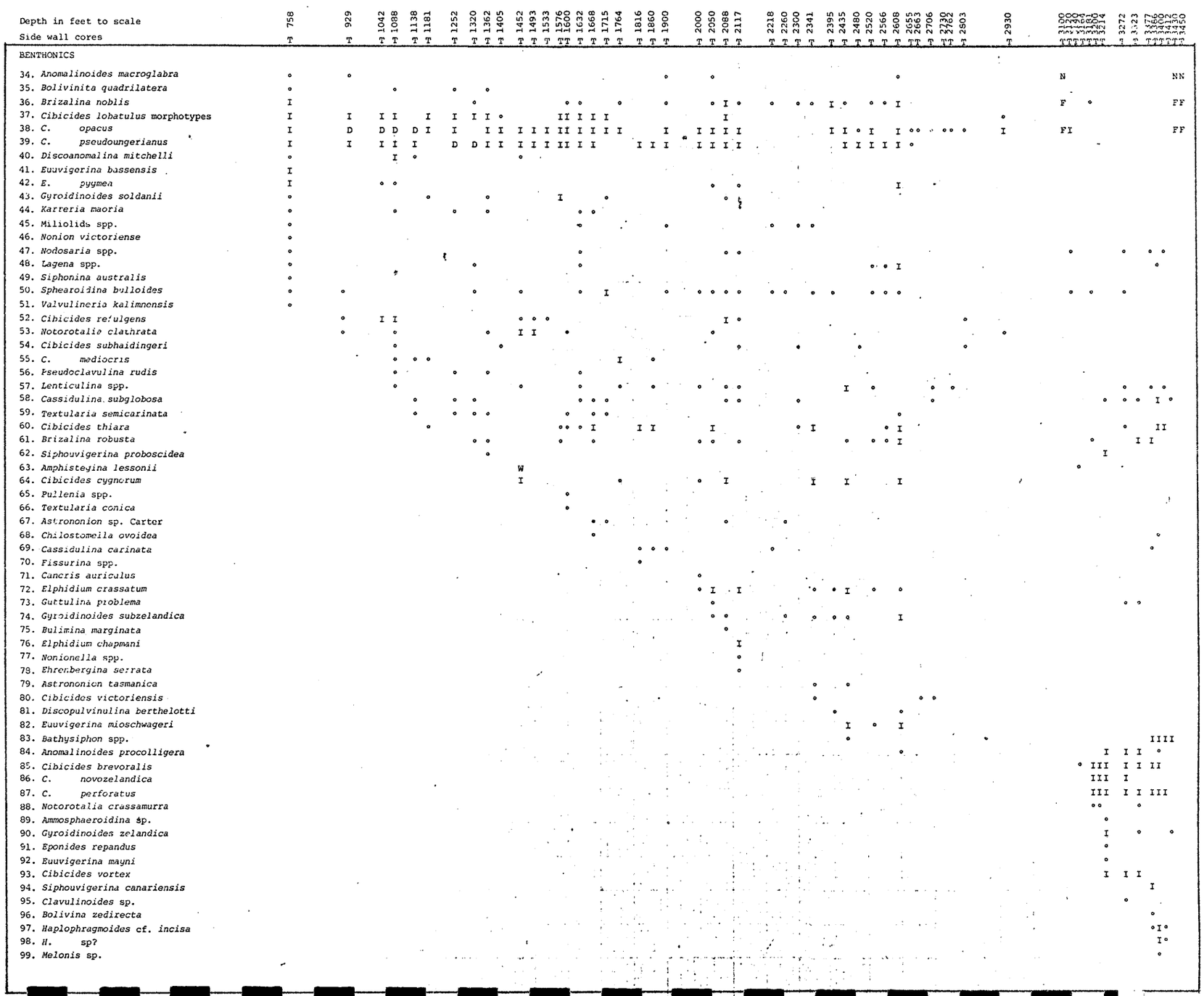
0 SWC or Core - Complete assemblage (very high confidence).
1 SWC or Core - Almost complete assemblage (high confidence).
2 SWC or Core - Close to zonule change but able to interpret (low confidence).
3 Cuttings - Complete assemblage (low confidence).
4 Cuttings - Incomplete assemblage, next to uninterpretable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

Date Revised _____

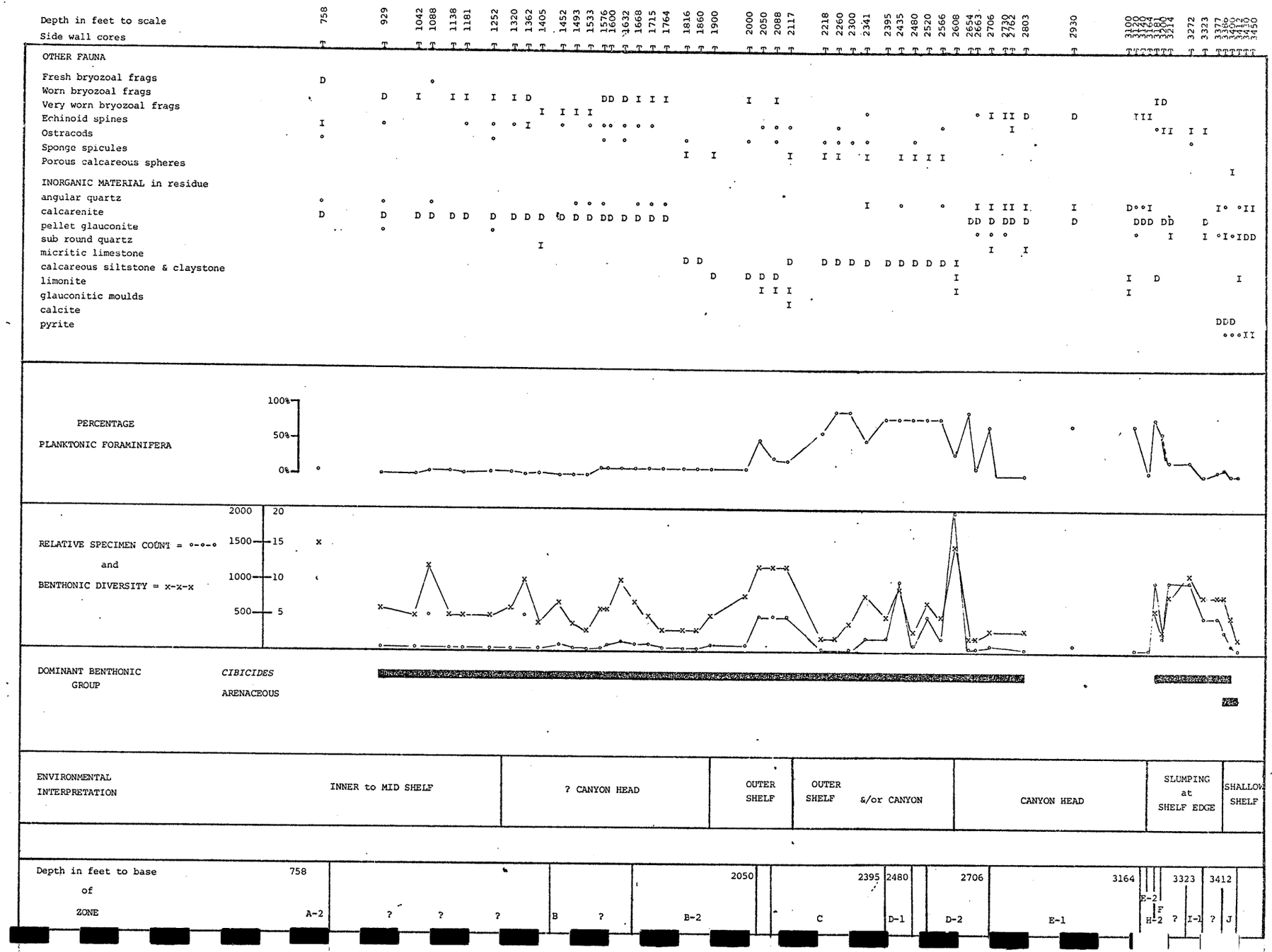
By _____

BARRACOUTA # 4




Depth in feet to scale
Side wall cores
758
929
1042
1088
1138
1181
1252
1320
1362
1405
1452
1493
1533
1576
1600
1632
1668
1715
1764
1816
1860
1900
2000
2050
2088
2117
2218
2260
2300
2341
2395
2435
2480
2520
2566
2608
2655
2663
2706
2730
2782
2803
2930
3100
3120
3140
3160
3181
3200
3214
3272
3323
3377
3406
3412
3430
3450
BENTHONICS
34. Anomalinoides macroglabra
35. Bolivinita quadrilatera
36. Brizalina noblis
37. Cibicides lobatulus morphotypes
38. C. opacus
39. C. pseudoungerianus
40. Discoanomalina mitchelli
41. Euuvigerina bassensis
42. E. pygmea
43. Gyroidinoides soldanii
44. Karreria maoria
45. Miliolids spp.
46. Nonion victoriense
47. Nodosaria spp.
48. Lagena spp.
49. Siphonina australis
50. Sphaeroidina bulloides
51. Valvulineria kalimnensis
52. Cibicides refulgens
53. Notorotalia clathrata
54. Cibicides subhaidingeri
55. C. mediocris
56. Pseudoclavulina rudis
57. Lenticulina spp.
58. Cassidulina subglobosa
59. Textularia semicarinata
60. Cibicides thiara
61. Brizalina robusta
62. Siphouvigerina proboscidea
63. Amphisteyina lessonii
64. Cibicides cygnorum
65. Pullenia spp.
66. Textularia conica
67. Astrononion sp. Carter
68. Chilostomella ovoidea
69. Cassidulina carinata
70. Fissurina spp.
71. Cancris auriculus
72. Elphidium crassatum
73. Guttulina problema
74. Gyroidinoides subzelandica
75. Bulimina marginata
76. Elphidium chapmani
77. Nonionella spp.
78. Ehrenbergina serrata
79. Astrononion tasmanica
80. Cibicides victoriensis
81. Discopulvinulina berthelotti
82. Euuvigerina mioschwageri
83. Bathysiphon spp.
84. Anomalinoides procolligera
85. Cibicides brevoralis
86. C. novozelandica
87. C. perforatus
88. Notorotalia crassamurra
89. Ammosphaeroidina sp.
90. Gyroidinoides zelandica
91. Eponides repandus
92. Euuvigerina mayni
93. Cibicides vortex
94. Siphouvigerina canariensis
95. Clavulinoides sp.
96. Bolivina zedirecta
97. Haplophragmoides cf. incisa
98. H. sp?
99. Melonis sp.

BARRACOUTA # 4



APPENDIX VIII

APPENDIX 8

PALYNOLOGICAL ANALYSIS
BARRACOUTA-4
GIPPSLAND BASIN

PALYNOLOGICAL ANALYSIS

BARRACOUTA-4,

GIPPSLAND BASIN,

by

Alan D. Partridge

Esso Australia Ltd

Esso Australia Ltd
Palaeontological Report: 1977/16

August 11, 1977.

INTRODUCTION

Forty-two sidewall core and conventional core samples and ten samples of coal separated from cuttings were examined from Barracouta-4. The good sampling in Barracouta-4 makes it the best well for documenting the palynology of the upper part of the Latrobe Group on the Barracouta Structure. The zones recognised in the well are summarised below while all the samples examined are listed on Table-1 and confidence ratings for the zone intervals are given on the accompanying Data Sheet.

SUMMARY

UNIT	SPORE-POLLEN ZONE	DEPTH IN FEET
Lakes Entrance Formation	*P. tuberculatus*	3323 to 3412
	UNCONFORMITY	
Gurnard Formation	Middle *N. asperus**	3430 to 3450
Latrobe Coarse Clastics	Middle *N. asperus**	3454 to 3482
	Lower *N. asperus*	3642 to 4006
	P. asperopolus	4251 to 4615
	Upper *M. diversus*	4739 to 4780
		T.D. 4783

**Deflandrea extensa*

Dinoflagellate Zone 3430 to 3454 feet.

GEOLOGICAL COMMENTS

1. All samples from the greensand at the top of the Latrobe Group gave Middle *N. asperus* Zone spore-pollen assemblages and *Deflandrea extensa* Zone dinoflagellate assemblages. This unit is therefore younger than the main development of the Gurnard Formation in the central part of the basin where it is generally thicker and has a Lower *N. asperus* Zone age.

2. The Upper *N. asperus* Zone is either absent in Barracouta-4 or present in the 18 feet sampling gap between 3412-3430 feet. It could lie within this gap, since in Swordfish-1 this zone is only present in two sidewall cores separated by 4 feet, and because of good sample control can only have a maximum thickness of 10 feet.

3. There is no recognisable age break between the greensand in Barracouta-4 and the underlying coarse clastics as both spore-pollen and dinoflagellate assemblages fall within the same zone on either side of this boundary. There is however a noticeable reduction in abundance and diversity among the dinoflagellates across this boundary which is consistent with the change in environment implied by the lithologies.

4. The Lower to Middle *N. asperus* Zone boundary falls within the top 150 feet of the coarse clastics, where it corresponds to the unconformity separating the N-1.1 and N-1.2 reservoir units (Threlfall et al 1976) which lies at 3503 feet.

5. The Lower N. asperus and P. asperopolus Zone boundary is particularly hard to relate to a distinct unconformity or lithological change even though this boundary has been correlated with the time of cutting of the Marlin Channel deeper in the basin (Partridge 1976). The boundary in Barracouta-4 appears to lie within the unit containing several thick coal seams between the samples at 4006 and 4251 feet which contain good assemblages of the respective zones. However, assemblages from the coals would favour putting the boundary at the base of this coally interval.

6. With the good sampling in Barracouta-4 it has been possible to demonstrate clearly that the abundance of the pollen Proteacedites pachypolus and/or P. asperopolus is only found in certain samples in the P. asperopolus Zone, and further that it is not necessarily even restricted to that zone. The latter is demonstrated by the abundance of P. pachypolus and especially P. asperopolus in two samples from the Lower N. asperus Zone (see Table-1). Obviously the "abundances" are partially environmentally controlled and considering the geographic position of Barracouta-4 that control appears to be related to the position of the shoreline in the Early and Middle Eocene.

DISCUSSION OF ZONES

The species identified in the samples examined are given on Table-1 and the attached distribition sheets. The basis for choosing the zone intervals is discussed in the following.

Upper Malvacepollis diversus Zone 4739 to 4780 feet

Barracouta-4 reached total depth within the Upper M. diversus Zone which is identified by the presence of Proteacidites ornatus, P. tuberculiformis and in the upper portion of the zone by Proteacidites pachypolus and Myrtaceidites tenuis. No dinoflagellates were observed in any samples from this zone.

Proteacidites asperopolus Zone 4251 to 4615 feet

The base of the P. asperopolus Zone is taken at the base of the abundant occurrence of Proteacidites pachypolus. This occurs in core-2 within the shale section above the M-1 oil reservoir. Analysis of a number of samples from core-2 clearly shows that the P. pachypolus abundance is not characteristic of all samples in this zone and this implies that the abundance is ecologically controlled as well as age controlled. This partial environmental control is further highlighted by the occurrence within the Lower N. asperus Zone of abundant Proteacidites asperopolus (31%) at 3834 feet and an abundance of both P. asperopolus and P. pachypolus (3.2%) at 3912 feet.

As in Swordfish-1 (Partridge 1977) the first appearance of the species Proteacidites asperopolus, Santalumidites cainozoicus, Sapotaceoidaepollenites rotundus and Conbaculites apiculatus used to mark the base of the P. asperopolus Zone in the absence of a P. pachypolus abundance were found to occur slightly above or later (the order of 100 feet or 0.75 to 1.0 million years) than the first samples containing the P. pachypolus abundance.

The top of the P. asperopolus Zone is taken at the last appearance of Intratriporopollenites notabilis and Conbaculites apiculatus at 4251 feet. Other species which can be used to mark the top of the P. asperopolus Zone become extinct in Barracouta-4 below this level.

Only a single sample in the P. asperopolus Zone contained dinoflagellates. This sample at 4498 feet contained 22.1% dinoflagellates relative to the associated spore-pollen. Of the dinoflagellates 93% were of the species Homotryblium tasmanensis. Unfortunately the dinoflagellate assemblage was not sufficiently diverse to refer it to either of the Wetzeliella zones

recognised within the P. asperopolus Zone (Partridge 1976).

Lower Nothofagidites asperus Zone 3642 to 4006 feet

The base of this zone is taken at 4006 feet which contains first appearances of Tricolpites simatus, Nothofagidites falcatus, N. asperus and Proteacidites reflexus. This is supported by the conspicuous occurrence of the dinoflagellate Areosphaeridium diktyoplokus (although total dinoflagellate count is less than 1%) which has not been recorded from below the Lower N. asperus Zone.

There is a 245 feet sampling gap in which no sidewall cores were shot between the base of this zone and the top of the P. asperopolus Zone.

Coal however was extracted from cuttings samples at three levels within this sampling gap. These coal samples are thought to be fairly reliable as to depth, since the coal tends to be washed out quickly from the drilling mud (see sample descriptions) and can be readily separated from other lithologies by flotation in carbon tetrachloride. The assemblages from the coals because they are environmentally controlled were unfortunately not diagnostic of a particular zone. However, the presence of Proteacidites recavus and particularly its common occurrence in the sample from 4120-4130 feet would favour a Lower N. asperus Zone rather than P. asperopolus Zone age for this section.

Dinoflagellates occur sporadically in samples from the Lower N. asperus Zone. They are most abundant in the sidewall core at 3704 feet where they make up 6.4% of the assemblage, consisting mainly of the species Thalassiphora pelagica. However, aside from the presence of Areosphaeridium diktyoplokus at 4006 feet none of the other species identified are of age significance.

The top of the Lower N. asperus Zone is based on the negative evidence of absence of Middle N. asperus Zone indicator species.

Middle Nothofagidites asperus Zone 3430 to 3482 feet

The occurrence of Tricolpites thomasii at 3482 feet, Aglaoreidia qualumis at 3468 feet and Anacolosidites sectus and Triorites magnificus at 3454 feet are the reasons for placing the base of the Middle N. asperus Zone within the upper part of the coarse clastic facies of the Latrobe Group. This age dating is supported by the dinoflagellates although their diversity within the coarse clastic facies is rather low.

The samples between 3430 to 3450 feet from the "Gurnard greensand facies" contain the same diagnostic species and the assemblages are much more diverse. Among the dinoflagellate assemblages the presence of Eisenackia ornata and absence of Schematophora speciosus in the greensand suggests that the section correlates with the "Notostrea Greensand" and overlying section of the Browns Creek Clay in the Otway Basin.

The top of the Middle N. asperus Zone is placed at the sample at 3430 feet which contains the diagnostic dinoflagellates Corrundinium incompositum and Deflandrea extensa. The immediately overlying sample at 3412 feet is referred to the Proteacidites tuberculatus Zone based on the presence of the spore Cyatheacidites annulata. The Upper N. asperus Zone was not recognised in the section and is probably not present even in the 18 feet sample gap between 3412 to 3430 feet.

REFERENCES

PARTRIDGE, A.D.,1976, The geological expression of eustacy in the Early Tertiary of the Gippsland Basin: APEA, Jour., Vol. 16, pt. 1, p. 73-79.

PARTRIDGE, A.D., 1977, Palynological analysis Swordfish-1, Gippsland Basin: Esso Australia Ltd., Palaeo. Report 1977/13.

THRELFALL, W.F., BROWN, B.R., and GRIFFITH, B.R., 1976, Gippsland Basin, Off-shore: Aust.Inst. Mining & Mettallurgy Monograph Series No. 7, p. 41-67.

TABLE-1: SUMMARY OF PALYNOLOGICAL ANALYSES, BARRACOUTA-4, GIPPSLAND BASIN

SAMPLE AND DEPTH		ZONE	AGE	CONFIDENCE RATING	YIELD	DIVERSITY	COMMENTS
SWC 88	3323'	P.tuberculatus	Late Oligocene	2	Very low	Low	
SWC 87	3377'	P.tuberculatus	Early Oligocene	1	Low	Low	
SWC 84	3412'	P.tuberculatus	Early Oligocene	1	Moderate	Moderate	
SWC 83	3430'	Middle N.asperus	Late Eocene	1	Moderate	Moderate	D.extensa Dino.Zone
SWC 82	3438'	" "	" "	0	Moderate	High	"
SWC 81	3443'	" "	" "	0	Moderate	High	"
SWC 80	3447'	" "	" "	0	Low	High	"
SWC 79	3450'	" "	" "	1	Moderate	Low	"
SWC 78	3454'	" "	" "	0	Low	Moderate	"
SWC 77	3456'	" "	" "	1	Low	Low	
SWC 76	3460'	" "	" "	1	Moderate	Moderate	
SWC 75	3468'	" "	" "	1	Moderate	Moderate	
SWC 74	3482'	" "	" "	1	Moderate	High	
Cuttings	3490-3500'	Indeterminant	"	-	Moderate	Low	Coal fraction of cuttings
Cuttings	3550-3570'	"	"	-	Very low	Low	Coal fraction of cuttings
SWC 70	3642'	Lower N.asperus	Middle Eocene	1	Moderate	Low	
SWC 69	3704'	" "	" "	1	Moderate	Moderate	
SWC 68	3734'	" "	" "	1	Moderate	Moderate	
SWC 67	3797'	" "	" "	1	Moderate	High	
SWC 66	3834'	" "	" "	1	Moderate	Low	P.asperopolus abundant 31%
SWC 65	3841'	" "	" "	1	Moderate	High	
SWC 64	3858'	Indeterminant	" "	-	Very low	Low	Virtually barren
Cuttings	3850-3860'	Indeterminant	" "	-	Moderate	Low	Coal fraction of cuttings
Cuttings	3900-3910'	Lower N.asperus	" "	3	Moderate	Low	Coal fraction of cuttings
SWC 63	3912'	Lower N.asperus	" "	1	Moderate	High	P.pachypolus and P.asperopolus 3.2%
SWC 62	3948'	Lower N.asperus	" "	1	Moderate	Moderate	
SWC 61	4006'	Lower N.asperus	" "	0	High	High	Occurrence of A.diktyoplokus
Cuttings	4010-4020'	Indeterminant		-	Moderate	Moderate	Coal fraction of cuttings
Cuttings	4050-4060'	"		-	Moderate	Moderate	Coal fraction of cuttings
Cuttings	4120-4130'	"		-	Moderate	Moderate	Coal fraction of cuttings
SWC 119	4251'	P.asperopolus	Early Eocene	1	Moderate	Moderate	Top occurrence of I.notabilis
SWC 117	4274'	"	" "	1	Moderate	Moderate	
Cuttings	4270-4280'	Indeterminant	" "	-	Low	Low	Coal fraction of cuttings
SWC 116	4306'	P.asperopolus	" "	1	Moderate	Moderate	P.pachypolus abundant 23%
SWC 115	4308'	"	" "	1	Low	Moderate	P.pachypolus abundant 14%
SWC 113	4384'	"	" "	1	High	High	P.pachypolus abundant 6%
SWC 112	4459'	"	" "	1	Moderate	Moderate	Top occurrence of M.tenuis
SWC 111	4498'	"	" "	0	High	High	Common Homotryblium tasmanense
Cuttings	4490'-4500'	P.asperopolus	" "	3	Moderate	Moderate	Coal fraction of cuttings
SWC 110	4511'	Barren	" "	-	-	-	
SWC 109	4516'	Indeterminant	" "	-	Very low	Low	Virtually barren
SWC 108	4550'	P.asperopolus	" "	1	Moderate	Moderate	P.pachypolus 10%
Core-2	4602'	"	" "	1	Moderate	Moderate	Coal, depth adjusted
Core-2	4604'	"	" "	1	Moderate	Moderate	P.pachypolus 22% depth adjusted
Core-2	4606'	"	" "	1	Moderate	Moderate	Depth adjusted
Core-2	4615'	"	" "	1	Moderate	Moderate	Coal, depth adjusted
Core-2	4618'	Indeterminant	" "	-	Very low	Very low	Virtually barren
Cuttings	4730-4740'	Upper M.diversus	Early Eocene	3	Moderate	High	Coal fraction of cuttings
SWC 95	4739'	" "	" "	1	High	High	
SWC 94	4753'	" "	" "	1	High	Moderate	Abundant Cyathidites splendens
SWC 93	4756'	Indeterminant	" "	-	Very low	Very low	Virtually barren
SWC 91	4780'	Upper M.diversus	" "	1	Low	Moderate	

BASIN GIPPSLAND BASIN DATE

WELL NAME BARRACOUTA-4 ELEVATION K.B. + 83 feet

AGE	PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
MIO.	P. tuberculatus	3323	2	3377	1		3412	1			
	U. N. asperus										
EOCENE	M. N. asperus	3430	1	3438	0		3482	1			
	L. N. asperus	3642	1				4006	0			
	P. asperopolus	4251	1				4615	1			
	U. M. diversus	4739	1				4780	1			
	M. M. diversus										
	L. M. diversus										
PALEOCENE	U. L. balmei										
	L. L. balmei										
	T. longus										
LATE CRETACEOUS	T. lilliei										
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS: Deflandrea extensa Dinoflagellate Zone 3430 to 3454 feet

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

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

DATA RECORDED BY: Alan Partridge DATE July 20, 1977

DATA REVISED BY: DATE

FORM No R 315 12/72

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 1 of 7

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	T	S	S	S	S	S	S	S	T	T	S	S	S	S
DEPTHS / PALYNOMORPHS	3323'	3377'	3412'	3430'	3438'	3443'	3447'	3450'	3454'	3456'	3460'	3468'	3482'	3490-500'T	3550-570'T	3642'	3704'	3734'	3797'	3834'	3841'	3858'	3850-560'T	3900-010'T	3912'	3948'	4006'	4010-120'T
A. qualumis																													
A. acutullus																													
A. luteoides																													
A. oculatus																													
A. sectus																													
A. triplaxis																													
A. obscurus																													
B. disconformis																													
B. arcuatus																													
B. elongatus																													
B. mutabilis																													
B. otwayensis																													
B. elegansiformis																													
B. trigonalis																													
B. verrucosus																													
B. bombaxoides																													
B. emaciatus																													
C. bullatus																													
C. heskermensis																													
C. horrendus																													
C. meleosus																													
C. apiculatus																													
C. leptos																													
C. striatus																													
C. vanraadshoovenii																													
C. orthoteichus/major																													
C. annulatus																													
C. gigantis																													
C. splendens																													
D. australiensis																													
D. granulatus																													
D. tuberculatus																													
D. delicatus																													
D. semilunatus																													
E. notensis																													
E. crassiexinus																													
F. balteus																													
F. crater																													
F. lucunosus																													
F. palaequetrus																													
G. edwardsii																													
G. rudata																													
G. divaricatus																													
G. gestus																													
G. catathus																													
G. cranwellae																													
G. wahooensis																													
G. bassensis																													
G. nebulosus																													
H. harrisii											A												A	A				
H. astrus																													
H. elliottii																													
I. anguloclavatus																													
I. antipodus																													
I. notabilis																													
I. gremius																													
I. irregularis																													
J. peiratus																													
K. waterbolkii																													
L. amplus																													
L. crassus																													
L. ohaiensis																													
L. bainii																													
L. lanceolatus													A																
L. balmei																													
L. florinii																													
M. diversus																													
M. duratus																													
M. grandis																													
M. perimagnus																													

*C = core; S = sidewall core; T = cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 2 of 7

SAMPLE TYPE *	C	S	S	S	S	S	S	S	S	S	S	S	S	S	T	T	S	S	S	S	S	S	S	T	T	S	S	S	T
DEPTHS / PALYNOMORPHS	3323'	3377'	3412'	3430'	3438'	3443'	3447'	3450'	3454'	3456'	3460'	3468'	3482'	3490-500'	3550-570'	3642'	3704'	3734'	3797'	3834'	3841'	3858'	3850-560'	3900-010'	3912'	3948'	4006'	4010-120'
M. subtilis																													
M. ornamentalis																													
M. hypolaenoides																													
M. homeopunctatus																													
M. parvus/mesonesus																													
M. tenuis																													
M. verrucosus																													
M. australis																													
N. asperus																													
N. asperoides																													
N. brachyspinulosus																													
N. deminutus																													
N. emarcidus/heterus																													
N. endurus																													
N. falcatus																													
N. flemingii																													
N. goniatus																													
N. senectus																													
N. vansteenisii																													
O. sentosa																													
P. ochesis																													
P. catastus																													
P. demarcatus																													
P. magnus																													
P. polyoratus																													
P. vesicus																													
P. densus																													
P. velosus																													
P. morganii/jubatus																													
P. mawsonii					A						A			A															
P. reticulosaccatus																													
P. verrucosus																													
P. crescentis																													
P. esobalteus																													
P. langstonii																													
P. reticulatus																													
P. simplex																													
P. varus																													
P. adenanthoides (Prot.)																													
P. alveolatus																													
P. amolosexinus																													
P. angulatus																													
P. annularis																													
P. asperopolus																				A									
P. biornatus																													
P. clarus																													
P. cleinei																													
P. confragosus																													
P. crassis																													
P. delicatus																													
P. formosus																													
P. grandis																													
P. grevillaensis																													
P. incurvatus																													
P. intricatus																													
P. kopiensis																													
P. lapis																													
P. latrobensis																													
P. leightonii																													
P. obesolabrus																													
P. obscurus																								A					A
P. ornatus																													
P. otwayensis																													
P. pachypolus																													
P. palisadus																													
P. parvus																													
P. plemmelus																													
P. prodigus																													
P. pseudomoides																													
P. recavus																													

*C= core; S= sidewall core; T= cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 3 of 7

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	T	S	S	S	S	S	S	T	T	S	S	S	T
DEPTHS / PALYNOMORPHS	3323'	3377'	3412'	3430'	3438'	3443'	3447'	3450'	3454'	3456'	3460'	3468'	3482'	3490-500'	3550-570	3642'	3704'	3734'	3797'	3834'	3841'	3858'	3850-560'	3900-010'	3912'	3948'	4006'	4010-120
P. rectomarginis			/				/																					
P. reflexus												/	/								/					/		
P. reticulatus																												
P. reticuloconcavus																												
P. reticuloscabratus																												
P. rugulatus						/																						
P. scitus																												
P. stipplatus																												
P. tenuiexinus																			/						/			
P. truncatus																												
P. tuberculatus																												
P. tuberculiformis																												
P. tuberculotumulatus																			/									
P. xestoformis (Prot.)							/																					
Q. brossus																												
R. boxatus																												
R. stellatus																												
R. mallatus																									/			
R. trophus						/																			/		/	
S. cainozoicus				/	/	/	/						/				/	/		/	/	/			/	/	/	
S. rotundus					/	/											/										/	
S. digitatoides																												
S. marlinensis																												
S. rarus																			/									
S. meridianus							/		/	/	/	/	/	/		/	/		/	A	A		A	A	/		/	/
S. prominatus																												
S. uvatus									/				A															
S. punctatus				/														/							A			
S. regium																												
T. multistrixus (CP4)																												
T. textus																												
T. verrucosus																												
T. securus																												
T. confessus (C3)																												
T. gillii																												
T. incisus																												
T. longus																												
T. phillipsii																			/						/		/	
T. renmarkensis																												
T. sabulosus																												
T. simatus								/					/				/		/		/				/		/	
T. thomasii				/									/															
T. waiparaensis																												
T. adelaidensis (CP3)				/	/	/			/	/	/	/	/	/	/	/	/	/	/	A	/		/	A	/	/	/	A
T. angurium																												
T. delicatus																												
T. geraniodes																												
T. leuros											/	/	/	/		/										/		
T. lilliei																												
T. marginatus																												
T. moultonii																												
T. paenestriatus																	/									/	/	
T. retequetrus																			/									
T. scabratus												/	/			/		/	/								/	
T. sphaerica												/				/		/	/		/						/	/
T. magnificus (P3)				/	A		/	A	/																			
T. spinosus																												
T. ambiguus						/							/						/							/	/	
T. chnosus																												
T. helosus																										/		/
T. scabratus											/														/			
T. sectilis																												
V. attinatus																												
V. cristatus																												
V. kapukuensis				/	/	/	/						/												/			

*C=core; S=sidewall core; T=cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 4 of 7

SAMPLE TYPE *	T	T	S	S	T	S	S	S	S	S	T	S	S	C	C	C	C	C	T	S	S	S	S					
DEPTHS / PALYNOMORPHS	4050'-60	4120-30'	4251'	4274'	4270-80'	4306'	4308'	4384'	4459'	4498'	4490-500'	4516'	4550'	4602'	4604'	4606'	4615'	4618'	4730-40'	4739'	4753'	4756'	4780'						
A. qualumis														cf														
A. acutullus								/		/						/												
A. luteoides																												
A. oculatus																												
A. sectus																												
A. triplaxis																												
A. obscurus																												
B. disconformis				/					/											/	/		/					
B. arcuatus		/						/	A					/						/								
B. elongatus																							/					
B. mutabilis																												
B. otwayensis																												
B. elegansiformis										/																		
B. trigonalis																												
B. verrucosus								/											/									
B. bombaxoides																												
B. emaciatus										/										/								
C. bullatus																												
C. heskermensis																												
C. horrendus																												
C. meleosus																												
C. apiculatus			/	/		/																						
C. leptos										/																		
C. striatus																												
C. vanraadshoovenii																												
C. orthoteichus/major			/	/		/		/	/	/	/		/							/								
C. annulatus																												
C. gigantis																												
C. splendens			/	/	/	/	/	/	/	/	/		/		/	/				/	A		/					
D. australiensis			/																									
D. granulatus			/	/		/			/		/		/	/		/	/			/			/					
D. tuberculatus			/	/		/				/			/															
D. delicatus								/		/			/															
D. semilunatus																												
E. notensis				/																								
E. crassiexinus								/																				
F. balteus					/	/	/																					
F. crater																												
F. lucunosus																												
F. palaequetrus																												
G. edwardsii																												
G. rudata																												
G. divaricatus										/										/								
G. gestus																												
G. catathus			/																									
G. cranwellae																												
G. wahooensis																												
G. bassensis																												
G. nebulosus																												
H. harrisii	A	A	/	/	/	/	/	/	/	/	/	/	/	/	/	A	/		A	/	/	/						
H. astrus						/				/			/						/									
H. elliottii																												
I. anguloclavatus		/		/		/							/				/			/								
I. antipodus																												
I. notabilis			/					/	/	/										/								
I. gremius								/																				
I. irregularis			/						/											/								
J. peiratus																												
K. waterbolkii								/	/											/								
L. amplus																												
L. crassus						/	/																					
L. ohaiensis																												
L. bainii								1																				
L. lanceolatus																												
L. balmei																												
L. florinii	/	/	/	/		/	/	/	/	/	/		/	/	/	/	/		A	/									
M. diversus						/	/							/	/	/	/			/			/					
M. duratus																												
M. grandis																												
M. perimagnus																												

*C= core; S= sidewall core; T= cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 5 of 7

SAMPLE TYPE *	T	T	S	S	T	S	S	S	S	S	T	S	S	C	C	C	C	C	T	S	S	S	S
DEPTHS / PALYNOMORPHS	4050-60'	4120-30'	4251'	4274'	4270-80'	4306'	4308'	4384'	4459'	4498'	4490-500	4516'	4550'	4602'	4604'	4606'	4615'	4618'	4730-40'	4739'	4753'	4756'	4780'
M. subtilis	/	/	/	/		A	/	/	/	A	A		A	A	A	A	A		A	A			/
M. ornamentalis																							
M. hypolaenoides														A									
M. homeopunctatus																							
M. parvus/mesonesus			/	/				/					A		/	A	/			/			
M. tenuis									A	A	A		/		/				/				
M. verrucosus																							
M. australis																							
N. asperus																							
N. asperoides																							
N. brachyspinulosus																				/			
N. deminutus		/		/				/															
N. emarcidus/heterus	/	/	/	/		/	/	/	/	/	R		/	/		/	/		/	/	/		
N. endurus																							
N. falcatus																							
N. flemingii		/	/	/			/	/	/	/	/		/						/	R			/
N. goniatus			/	/				/															
N. senectus																							
N. vansteenisii							/				/												
O. sentosa																							
P. ochesis																							
P. catastus																							
P. demarcatus		/	/	/											/	/	/			/			
P. magnus																							
P. polyoratus				/																			
P. vesicus																							
P. densus									/														
P. velosus										/													
P. morganii/jubatus																							
P. mawsonii	/	/	A	/		/	/	/	/	/			/				/		A	/			
P. reticulosaccatus																							
P. verrucosus																							
P. crescentis																							
P. esobalteus			/			/	/			/	/						/						
P. langstonii																							
P. reticulatus																							
P. simplex																							
P. varus																							
P. adenanthoides (Prot.)		/	/	/						/				A	/	/							
P. alveolatus													/										
P. amolosexinus																							
P. angulatus																							
P. annularis	/	/	/	/		/	/		/	/	/		/	A	/		/		/				
P. asperopolus			/	/				/		/			/										
P. biornatus													/										
P. clarus			/																				
P. cleinei																							
P. confragosus																							
P. crassis	/	/	/	/				/															
P. delicatus																							
P. formosus				/																			
P. grandis								/		/				/			A						
P. grevillaensis																							
P. incurvatus																							
P. intricatus																							
P. kopiensis			/			/	/		/											/	cf		
P. lapis																							
P. latrobensis																							
P. leightonii						/		/	/				/			/	/	/					
P. obesolabrus																							
P. obscurus	/	/	/	/							/			A							/		
P. ornatus										A			/			/				/	A		/
P. otwayensis																							
P. pachypolus						A	A	A	/	/	A		A	/	A	/			/	/			
P. palisadus																							
P. parvus																							
P. plemmelus								/															
P. prodigus							/	/															
P. pseudomoides								/					/										
P. recavus	/	A	/																				

*C= core; S= sidewall core; T= cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 6 of 7

SAMPLE TYPE *	T	T	S	S	T	S	S	S	S	S	T	S	S	C	C	C	C	C	T	S	S	S	S					
DEPTHS / PALYNOMORPHS	4050-60'	4120-30'	4251'	4274'	4270-80'	4306'	4308'	4384'	4459'	4498'	4490-500'	4516'	4550'	4602'	4604'	4606'	4615'	4618'	4730-40'	4739'	4753'	4756'	4780'						
P. rectomarginis																												
P. reflexus																												
P. reticulatus																												
P. reticuloconcavus																												
P. reticuloscabratus			/					/	/	/										/								
P. rugulatus																												
P. scitus																												
P. stipplatus																												
P. tenuiexinus			/							/																		
P. truncatus																												
P. tuberculatus																												
P. tuberculiformis									/	/			/				/			/	A							
P. tuberculotumulatus								/																				
P. xestoformis (Prot.)								/		/																		
Q. brossus																												
R. boxatus								/																				
R. stellatus																												
R. mallatus							/	/		/			/							/								
R. trophus																												
S. cainozoicus	/	/		/				A	/	/	/		/															
S. rotundus								/		/																		
S. digitatoides																												
S. marlinensis				/																								
S. rarus																				/								
S. meridianus			/	/		/	A	/		/	A		A	A	/	/	A		A	/								
S. prominatus																												
S. uvatus																												
S. punctatus										/										/								
S. regium																												
T. multistrixus (CP4)																												
T. textus																												
T. verrucosus																												
T. securus																												
T. confessus (C3)																												
T. gillii																												
T. incisus																												
T. longus																												
T. phillipsii								/																				
T. renmarkensis																												
T. sabulosus																												
T. simatus																												
T. thomasii																												
T. waiparaensis																												
T. adelaidensis (CP3)	A	/			/	/	/	/	/	/			/															
T. angurium																												
T. delicatus																												
T. geraniodes																												
T. leuros	/	/																										
T. lilliei																												
T. marginatus																												
T. moultonii				/									/							/								
T. paenestriatus			/	/				/	/	/	/		/		/					/		/						
T. retequetrus																												
T. scabratus				/																								
T. sphaerica								/		/			/															
T. magnificus (P3)																												
T. spinosus																												
T. ambiguus		/				/																						
T. chnosus																												
T. helosus									/	/									/									
T. scabratus	/	/																										
T. sectilis																												
V. attinatus																												
V. cristatus																												
V. kopukuensis		/				/	/	/	/			/							/									
Cycadopites sp.								/			/			/	A	A	A		/									

*C=core; S=sidewall core; T=cuttings.

Well Name BARRACOUTA-4 Basin GIPPSLAND Sheet No. 7 of 7

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S								
DEPTHS / PALYNOMORPHS	3323'	3377'	3412'	3430'	3438'	3443'	3447'	3450'	3454'	3456'	3460'	3468'	3482'	3642'	3704'	3734'	3797'	3841'	4006'	4498'										
Holor. incurvata	/	/	/	/	/	/	/	/				/																		
Spinif. ramosa	/	/	/	/	/	/	/	/				/																		
Operc. centrocarpum	A	/			A	/	A	/	/	/		/																		
Lingu. machaerophorum		/	/	/	/									/																
Penta. lacticinctum		/																		/									
Rottn. borussica		cf	/																											
Tecta. pellitum			/																											
Cyclo. vieta			/																											
Crass. concinnia			/																											
Defla. phosphoritica			/	/	/			/	/																					
Syste. placacantha			cf	/	/	/				/																				
Corru. incompositum				/		/	/																							
Cordo. capricornum				/	/	/																								
Defla. extensa				/	A	A	A	A	A		cf																			
Phtha. coreoides					/																									
Spinif. laceolatus					/																									
Holor. spinosus					/																									
Eisen. ornata					/	/																								
Membr. adnata					/	/																								
Lepto. dispertitum					/	/																								
Corru. corrugatum					/	/																								
Praeo. indentata					/				A																					
Phtha. eocenicum						/																								
Defla. leptodermata						/																								
Hemip. semilunifera						/																								
Lepto. elegans						/																								
Hystr. camera						/																								
Samla. reticulifera						/	/																							
Cassi. imperfecta						/	/																							
Tecta. marlum						/		/																						
H/kolp. rigaudae						/	/	/							/															
Dyphes ariensis							/																							
Hysti. variata							/																							
Batia. cempta							/																							
Balti. nanum							/																							
Syste. speciosus							cf			/																				
Emsla. australiensis							/										/													
Heter. paxilla							/	/																						
Membr. clathrodermata								/																						
Batia. dentalia									/																					
Thala. pelagica									/						A	/														
Leptodinium sp.													/																	
Spinidinium spp.														/	/	/	/	/	/	/										
Areos. diktyoplokus																			A											
Hemicystidinium sp.																			/											
Homot. tasmanensis																				A										
Wetze. hyperacantha																				/										
Defla. pachyceros																				/										

*C=core; S=sidewall core; T=cuttings.

PE905979

This is an enclosure indicator page.
The enclosure PE905979 is enclosed within the container PE902269 at this location in this document.

The enclosure PE905979 has the following characteristics:

ITEM_BARCODE	PE905979
CONTAINER_BARCODE	PE902269
NAME	Structure Map, Top of M-1 Oil Sand
BASIN	GIPPSLAND BASIN
PERMIT	VIC/L2
TYPE	WELL
SUBTYPE	HRZN_CNTR_MAP
DESCRIPTION	Structure Map, Top of M-1 Oil Sand (from WCR) for Barracouta-4
REMARKS	
DATE_CREATED	31/07/77
DATE_RECEIVED	
W_NO	W688
WELL_NAME	BARRACOUTA-4
CONTRACTOR	
CLIENT_OP_CO	ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

(Inserted by DNRE - Vic Govt Mines Dept)

PE902272

This is an enclosure indicator page.
The enclosure PE902272 is enclosed within the container PE902269 at this location in this document.

The enclosure PE902272 has the following characteristics:

ITEM_BARCODE	= PE902272
CONTAINER_BARCODE	= PE902269
NAME	= Structural Cross Section A-A'
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Structural Cross Section A-A' (from WCR) for Barracouta-4
REMARKS	=
DATE_CREATED	= 31/07/1977
DATE_RECEIVED	=
W_NO	= W688
WELL_NAME	= Barracouta-4
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902271

This is an enclosure indicator page.
The enclosure PE902271 is enclosed within the container PE902269 at this location in this document.

The enclosure PE902271 has the following characteristics:

ITEM_BARCODE	= PE902271
CONTAINER_BARCODE	= PE902269
NAME	= Sonic Calibration Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Sonic Calibration Curve (from WCR) for Barracouta-4
REMARKS	=
DATE_CREATED	= 03/06/1977
DATE_RECEIVED	=
W_NO	= W688
WELL_NAME	= Barracouta-4
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902270

This is an enclosure indicator page.
The enclosure PE902270 is enclosed within the container PE902269 at this location in this document.

The enclosure PE902270 has the following characteristics:

ITEM_BARCODE	= PE902270
CONTAINER_BARCODE	= PE902269
NAME	= Time Depth Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve (from WCR) for Barracouta-4
REMARKS	=
DATE_CREATED	= 23/04/1977
DATE_RECEIVED	=
W_NO	= W688
WELL_NAME	= Barracouta-4
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601424

This is an enclosure indicator page.
The enclosure PE601424 is enclosed within the container PE902269 at this location in this document.

The enclosure PE601424 has the following characteristics:

ITEM_BARCODE	= PE601424
CONTAINER_BARCODE	= PE902269
NAME	= Well Completion Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion Log (from WCR) for Barracouta-4
REMARKS	=
DATE_CREATED	= 27/04/1977
DATE_RECEIVED	=
W_NO	= W688
WELL_NAME	= Barracouta-4
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)