

PSLA

2-D-3
5-B-5



WHELK No.1

TASMANIA DEPARTMENT OF MINES

ESSO STANDARD OIL (AUSTRALIA) LTD.

COMPLETION REPORT

I WELL DATA RECORD

Date 13-7-70

LOCATION

WELL NAME WIELK-1	STATE Tasmania	PERMIT or LICENCE TP/3	GEOLOGICAL BASIN Otway	FIELD Wildcat
CO-ORDINATES		MAP PROJECTION Transverse Mercator	GEOGRAPHICAL DESCRIPTION Offshore King Is. Tasmania 15 miles west of King Is.	
Surface	Lat. Long. 39° 53' 57.8" S. 143° 33' 20.9" E.			
Bottom Hole Straight hole.				
<u>ELEVATIONS & DEPTHS</u>				
ELEVATIONS	WATER DEPTH		TOTAL DEPTH	
Ground			M.D. 4810	
KB + 100'	338'		T.V.D.	
RT	PLUG BACK DEPTH		REASONS FOR P.B.	
Braden Head	Plug 1 - 1900'		Abandonment	
Top Deck Platform	Plug 2 - 525'			
<u>DATES</u>				
MOVE IN	RIG UP	SPUDDED		
2.3.70	5.3.70	6.3.70		
RIG DOWN COMPLETE	RIG RELEASED	PROD. UNIT - Start Rigging Up		
17.3.70	17.3.70			
PROD. UNIT - Rig Down Complete		I.P. ESTABLISHED		
<u>MISCELLANEOUS</u>				
OPERATOR	PERMITTEE or LICENCEE	ESSO INTEREST	OTHER INTEREST	
Esso	Hematite Petroleum Pty.Ltd.	Well 100% Permit Nil		
CONTRACTOR	RIG NAME	EQUIPMENT TYPE		
ODECO	Ocean Digger	Semi-Submersible Drilling Vessel.		
TOTAL RIG DAYS	DRILLING AFE NO.	COMPLETION NO.	TYPE COMPLETION	
14.7	237309			
LAHEE WELL	Before Drilling	New field wildcat.		
CLASSIFICATION	After Drilling	Abandoned NFW		

WELL

WHELK #1

IV CASING - LINER - TUBING RECORD							
Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
Conductor	30"x20"	Pile Joint		Vetco	1	40.48	
	20"	104	X55 L.P.	Vetco	11	462.96	934
Surface	13-3/8"	54.5		Butt.	1	39.08	
	9-5/8"	x 13-3/8" Butt Swage				1.60	
	9-5/8"	40	N-80	Butt.	39	1528.08	2003
Note:	Salvage of Pile Joint was unsuccessful.						

V CEMENT RECORD			
String	20"	9-5/8"	
Type of Cement	700 sx w/2% Gel 500 sx w/2% CaCl ₂	600 sx neat plus 200 sx w/2% CaCl ₂	
Number of FT ³	1717	952	
Average weight of slurry	13.7 / 15.5	15.5	
Cement Top	Sea Floor	1430' (Calc.)	
Casing Tested with	300 psi	1500 psi	
Number of Centralizers	0	6	
Number of Scratchers	0	0	
Stage Collar etc.	0	0	
Remarks	Gel Prehydrated	Cement top assumes 450' of 20" Hole.	

R.L. WOOD

Engineer

NAME	Tops		Gross Interval (ft)	Net Pay (ft).		REMARKS
	M.D.	Sub-sea		Gas	Oil	
Heytesbury Grp. (Olig.-Miocene)	7438	-338	742			
Wangerrip Grp. (Pal.-Eocene)	1180	-1080	1332			
Curdies (Upper Cret.)	2512	-2412	1684			
Paaratte (Upper Cret.)	4196	-4096	99			
Waarre (Upper Cret.)	4295	-4195	310			
Basement	4605	-4505				

X GEOLOGIC ANALYSIS (Pre Drilling prognosis Vs actual results)

Prawn-1, 44 miles north of Whelk, penetrated 2350 feet of Waarre Equivalent. The section consisted of 288 feet of rhyolitic conglomerate at the base overlain by 2062 feet of fine to coarse grained sandstone interbedded with siltstone and shale. Measured porosities in this sandstone exceeded 20 percent and permeabilities ranged up to 235 mds.

Clam-1, 75 miles south of Whelk, penetrated 72 feet of Waarre Equivalent. The section consisted of sandy siltstone with only a few thin stringers, not exceeding 3 feet with porosities up to 20 percent.

Whelk-1 was drilled to test anticipated Waarre sandstones with good reservoir characteristics in the transition from coarse clastic in the source area to the north (as shown by Prawn-1) to very fine grained in the south (as evident in Clam-1).

The Waarre section was interpreted to be approximately 900 feet thick at the Whelk location.

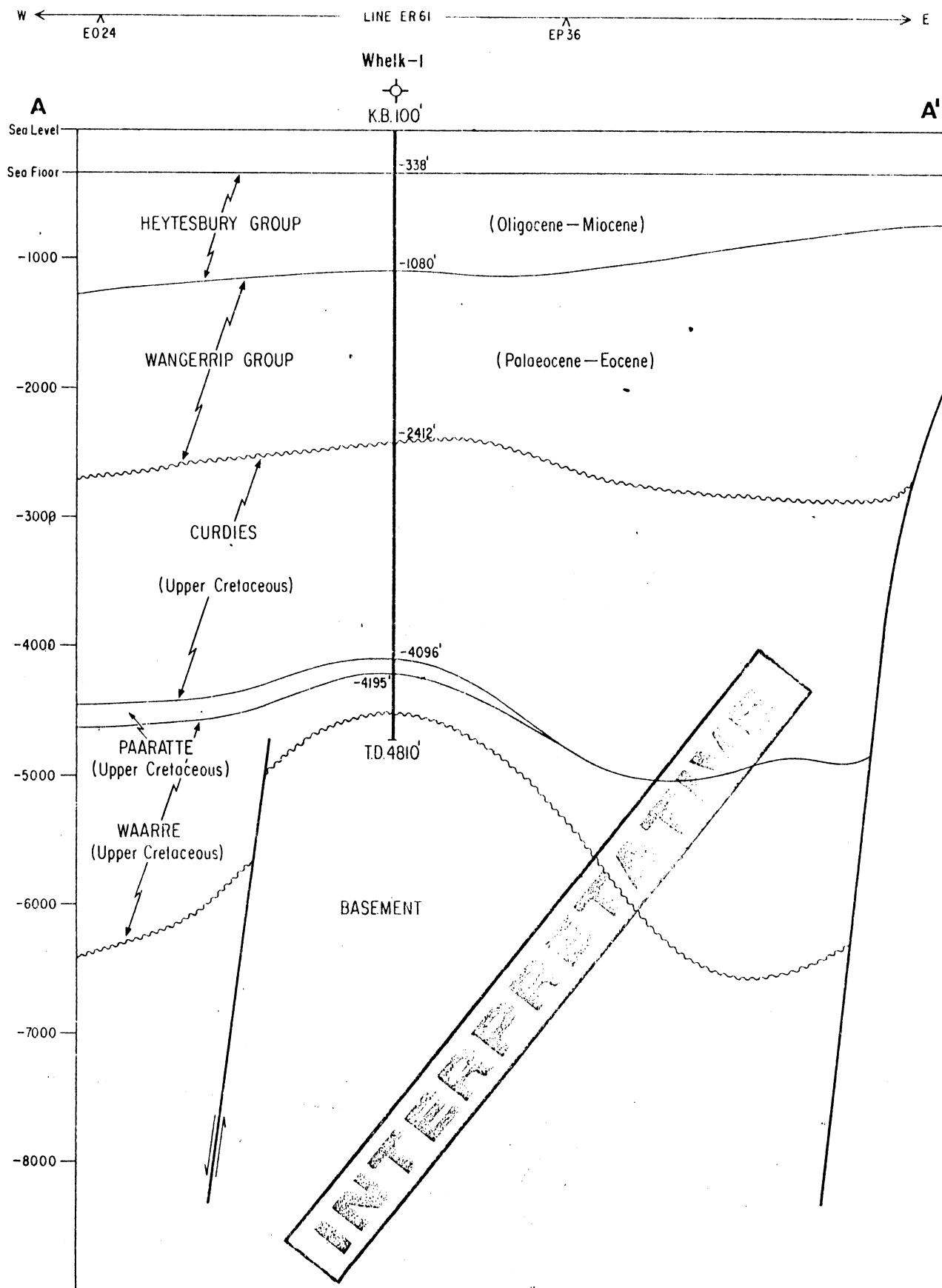
A structure map on the top of the Waarre prior to drilling showed a single anticlinal closure with 300 feet of vertical closure and extending over 17 square miles areally.

The well penetrated 310 feet of this formation which was dominantly coarse to very coarse sandstone with a fine to medium grained sandstone and argillaceous matrix. Lithologic and well-log correlations and velocity survey information have placed the top of this unit 45 feet lower than anticipated. Pre drilling structural morphology of the top of the Waarre has not been invalidated, but drilling has lowered the structure by 445 feet.

The Belfast Formation which is widely distributed throughout the Otway Basin and with little variation, consists of light grey to medium grey brown silty shale was anticipated to overlie the Waarre sequence and act as a seal. This lithologic unit was not encountered in drilling although silty sandstones and silty shales of Belfast time equivalence were encountered.

The reason for the well being dry could be ascribed to either lack of source for generation of hydrocarbons or the lack of adequate seal over the Waarre in this area for the trapping of hydrocarbons in the Whelk structure.

J.K. Davidson
Geologist



Horizontal Scale : 1 : 63,360

Vertical Scale : 1 : 12,000

J.K. Davidson

Geologist

Dwg 1248/OP/7

WELL WHELK-1

VII SAMPLES, CONVENTIONAL CORES, SW CORES					
INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
970-4238	Cuttings	Every 10'			
4278-4478	"	"			
4508-4800	"	"			
4238-68	Core No. 1	Cut 30' Rec. 29'			
4478-4508	Core No. 2	Cut 30' Rec. 27'			
991-1976	SWC	Shot 29. Rec. 24			
		Misfires 2. No recovery 3.			
2060-4795	SWC	Shot 30 Rec. 30.			
VIII WIRELINE LOGS AND SURVEYS (Incl. FIT)					
Type & Scale	From	To	Type & Scale	From	To
IES 2" & 5"/100'	934	4810			
BHCS-GR 2" & 5"/100'	935	4800			
FDC-GR 2" & 5"/100'	2004	4810			
CDM 2" & 5"/100'	2004	4799			
Velocity Survey					

J.K. Davidson
Geologist

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. Whelk No. 1

DATE ANALYSIS COMPLETED October 28, 1970

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
1	4240'2"	4240'5"	sst; f.gr to m.gr	29	14	157	1.91	2.69	15	nil	n.d.	neg.	nil
1	4245'3"	4245'10"	sst; m.gr arg.	32	358	531	1.87	2.73	25	nil	n.d.	neg.	nil
1	4250'4"	4251'0"	sst; f.gr arg. carb	30	4.9	923	1.94	2.74	20	nil	n.d.	neg.	nil
1	4259'6"	4260'0"	sst; f.gr chly carb	25	0.23	0.23	2.04	2.79	53	nil	n.d.	neg.	nil
2	4479'4"	4480'1"	sst; f.gr mic.	24	26	29	2.04	2.75	31	nil	n.d.	neg.	nil
2	4481'4"	4481'9"	sst; f.gr sl. arg	25	44	60	2.03	2.74	59	nil	n.d.	neg.	nil
2	4488'9"	4489'2"	sst; m.gr v. arg	27	143	144	2.02	2.78	45	nil	n.d.	neg.	nil
2	4493'6"	4493'10"	sst; f.gr mic. arg	25	35	46	2.03	2.76	48	nil	n.d.	neg.	nil

Remarks: -

General File No. 69/1414
Well File No. _____

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Vary Strong.

WELL NAME AND NO. Whelk No. 1

DATE ANALYSIS COMPLETED October 28, 1970

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
2	4496'9"	4497'4"	sst;m.gr arg. mic	21	8.7	22	2.10	2.73	48	nil	n.d.	neg.	nil

Remarks: -

General File No. 69/1414
Well File No. _____

HEMATITE PETROLEUM PROPRIETARY LIMITED

WEEKLY DRILLING REPORT

TENEMENT NUMBER: Tas/P3.
OPERATOR: Esso Standard Oil (Australia) Ltd.
DRILLING UNIT: "Ocean Digger".
WELL: Whelk-1.
DATE OF REPORT: 23rd March, 1970.
LOCATION: Latitude 39° 53' 58" South.
Longitude: 143° 33' 21" East.
WATER DEPTH: 330 feet.
PROGRESS: Current 4800 feet (T.D.)
Previous 4800 feet
Progress 0 feet

OPERATIONS:

Whelk-1 site was abandoned at 1300 hours on 17th March, "Ocean Digger" then moved to the Pelican-1 location in Permit TAS/P6. This is the final report.

M. M. Lonie

M. LONIE *all*

MES:YEF
Melbourne.

Revised of plugging program?

HEMATITE PETROLEUM PROPRIETARY LIMITED
WEEKLY DRILLING REPORT

TENEMENT NUMBER: Tas/P3.

OPERATOR: Esso Standard Oil (Australia) Ltd.

DRILLING UNIT: "Ocean Digger"

WELL: Whelk-1.

DATE OF REPORT: 16th March, 1970.

LOCATION: Latitude 39° 53' 58" South
Longitude 143° 33' 21" East

WATER DEPTH: 330 feet.

PROGRESS: Current 4800 feet (T.D.)
Previous 2047 feet
Progress 2753 feet

OPERATIONS:

During the week two conventional cores were cut, with an aggregate footage of 60 feet, and a recovery of 56 feet (93%). 30 SWC's were shot, all of which were recovered. A velocity survey was run and IES, Sonic, FDC and CDM logs were also run. Total depth of 4800 feet was reached on 15th March, and cement plugs have been set. The riser is currently being pulled preparatory to abandoning the location. "Ocean Digger" will be moved to the Pelican No.1 Well site in Permit TAS/P6.

CEMENT

<u>Plug No.</u>	<u>Depth (ft.)</u>	<u>Cement</u>
1	2620-1900	175 sacks neat cement plus 2% Ca Cl ₂ .
2	700-560	50 sacks neat cement.

20-inch and 9 5/8-inch casing head out.

GAS READINGS:

<u>Interval</u> <u>(ft.)</u>	<u>Hot Wire</u> <u>Cuttings</u>	<u>Hot Wire</u>	<u>C1</u>	<u>C2</u>	<u>C3</u>
2047-2930	0	2-4	40-200	-	-
2930-4004	0-6	1-4	4-40	-	-
4004-4221	0	trace	trace	-	-
4221-4610	trace	trace-1	1-13	-	-

LITHOLOGY:Interval
(ft.)

2047-2290	<u>Sand</u> , coarse-grained, loose, well rounded, quartzose, trace lithics and quartzite, limonite stained, some muscovite, chlorite and pyrite.
2290-2510	<u>Sand</u> , as above, some <u>Claystone</u> , desegregated in the mud.
2510-2740	<u>Claystone</u> , light grey to brown, silty to sandy, calcareous, interbedded with <u>Sandstone</u> , medium brown, very fine grained, slightly conglomeratic, very calcareous.
2740-2820	<u>Sand</u> , as above.
2820-3260	<u>Sand</u> , coarse to very fine-grained, interbedded with light grey <u>Claystone</u> , silty to sandy, soft, slightly calcareous.
3260-3740	<u>Claystone</u> , light grey, silty to sandy interbedded with 10-30% <u>Sandstone</u> light brown, very fine to medium-grained, calcareous, argillaceous, pyritic.
3740-4060	<u>Claystone</u> , as above, slightly carbonaceous, with 10-20% <u>Sandstone</u> , very fine, carbonaceous, to medium-grained and some coarse-grained between 4000 and 4020 feet.
4060-4170	<u>Claystone</u> , as above, with up to 40% <u>Sandstone</u> , as above, and fine to coarse-grained <u>Sand</u> ; 5-10% <u>Coal</u> .
4170-4238	<u>Claystone</u> , grey, silty, carbonaceous, interbedded with 30% <u>Sandstone</u> , fine to coarse-grained, trace <u>Coal</u> .

CORE NO.1.

<u>4238-4268</u>	Cut 30 feet, recovered 29 feet.
4238-4240	<u>Sandstone</u> and <u>Claystone</u> , thinly interlaminated. <u>Sandstone</u> , light grey, very fine-grained, quartzose, green-black matrix, argillaceous, micaceous, carbonaceous, pyritic. <u>Claystone</u> , dark grey, very silty, micaceous, carbonaceous.
4240-4253	<u>Sandstone</u> , grey medium-grained, clear to frosted quartz, 5-10% green-black matrix, weathered Feldspar, micaceous, carbonaceous, pyritic

CORE NO.1 (contd.)

4253-4267 Sandstone and Claystone, thinly interlaminated. Sandstone, light grey, very fine-grained, quartzose, green-black matrix, argillaceous, micaceous, carbonaceous, pyritic. Claystone, dark grey, very silty, micaceous, carbonaceous. Sandstone modules in Claystone and vice versa.

4267-4268 Not recovered.

4268-4310 Claystone with 30% Sandstone, light grey, very fine-grained.

4310-4440 Sand, fine to medium-grained, and coarse 10% grey chert, jasper, quartzite, chlorite?, interbedded Claystone.

4440-4478 Sandstone, medium to coarse grained, quartzose.

CORE NO.2

4478-4508 Cut 30 feet, recovered 27 feet.

4478-4505 Sandstone, medium to coarse-grained, with 15-20% lithics and white kaolin matix.

4505-4508 Not recovered.

4508-4590 Sandstone, as above.

4590-4620 95% Sandstone, as above.
5% red Claystone.

4620-4670 90% Claystone, variegated
10% Sandstone
No shows.

4670-4800 Decreasing red Claystone, increasing green chlorite schist and talc like material with veins of calcite.

CORE ANALYSIS:

<u>Core No.</u>	<u>Depth</u> <u>(ft.)</u>	<u>Porosity</u> <u>(%)</u>	<u>Permeability</u> <u>(millidarcies)</u>	<u>Water</u> <u>Saturation %</u>
1	4240	8.5	0	100
	4242	19.8	1730	100
	4245	11.5	1702	100
	4248	16.5	1437	100
	4251	15.6	432	100
	4254	8.2	0	100

4.

CORE ANALYSIS (Contd.)

<u>Core No.</u>	<u>Depth</u>	<u>Porosity</u> <u>(%)</u>	<u>Permeability</u> <u>(millidarcies)</u>	<u>Water</u> <u>Saturation %</u>
2	4478-4508	23.31	10-266	100

W M Lonie
W.M. LONIE *Et*

MES:YEF
Melbourne.

D of M	S & A	CC	CC & M	D.S.M.E.
RECEIVED				Registrar
15 MARCH 1970				E & IL
ANSWERED				
DEPT. OF MINES				
REF. NO.				

HEMATITE PETROLEUM PROPRIETARY LIMITED

WEEKLY DRILLING REPORT

TENEMENT NUMBER: Tas/P3

OPERATOR: Esso Standard Oil (Australia) Ltd.

DRILLING UNIT: "Lean Digger"

WELL: Whelk-1

DATE OF REPORT: 10th March, 1970

LOCATION: Latitude 39° 53' 58" South
Longitude 143° 33' 21" East

WATER DEPTH: 330 feet

PROGRESS:

Current	2047 feet
Previous	0 feet
Progress	2047 feet

OPERATIONS:

Whelk-1 was spudded at 0700 hours on 6th March, and a 20" casing string was set at 934 feet. 29 sidewall cores were shot, of which 24 were recovered, and IES and GR-Sonic logs were run. Currently running the 9 5/8" casing.

LITHOLOGY:

Interval (ft.)

970-1010	10% <u>Shale</u> , dark grey, friable 90% <u>Limestone</u> , skeletal, detrital.
1010-1140	0-60% <u>Limestone</u> , as above. 0-100% <u>Marl</u> , fossiliferous
1140-1180	<u>Sandstone</u> , calcareous, angular to sub-rounded, poorly sorted.
1180-1300	<u>Sandstone</u> , granular to pebbly, no matrix.
1300-2047	Sandstone, poorly sorted quartzose and lithics, with three types of matrix :

- (1) Pyritic, calcareous and black mud.
- (2) Pyritic, calcareous, and white mud.
- (3) Slightly calcareous, brown mud.

2.

GAS READINGS:

<u>Interval (ft.)</u>	<u>Hot Wire</u> <u>Cuttings</u>	<u>Hot</u> <u>Wire</u>	<u>C1</u>	<u>C2</u>	<u>C3</u>
970-2047	0	0-1	0-20	-	-

W.M. Lonie
W.M. LONIE *Bt*

MES:YEF
Melbourne.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 1

WELL: WHELK 1

Interval Cored 4238-68 ft., Cut 30 ft., Recovered 29 ft., (97 %) Fm. U.K. ?

Bit Type C-20 , Bit Size 8 5/16 in., Desc. by FEM Date 12 MAR 70

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 8 6 4 2				
40				THINLY INTERBED SS & CLYSTN. SS IS LT GR, VFG, MOSTLY WH. Qtz w/ 5-10% GN & BLK MAFICS, ARG., MICAC, SLI CARBON, SCATTERED PYRITE NODULES. CLYSTN IS DK GR, VERY SILTY GRADING TO SILTSTN, MICAC, SLI CARBON. CURRENT RIPPLES. SOME THIN BEDS OF SS DISRUPTED BY CURRENT W/ NODULES OF SS REWORKED INTO CLYSTN.
45				
50				SS, MED GR, MED GRAINED, MOSTLY CLR & FROSTED Qtz w/ 10% GN & BLK MAFICS, MICAC, ARGILL, WH CLY MATRIX APPEARS TO BE WEATHERED FELDSPAR, SCATTERED PYRITE NODULES, SCATTERED CARBON. CLYSTN LAMINAE SHOWING LOW ANGLE X BEDDING & SOME MINOR CURRENT RIPPLES. LITTLE OR NO GRADATION IN GRAIN SIZE. TOP & BTM CONTACTS SLI GRADATIONAL
55				
60				THINLY INTERBED SS & CLYSTN AS ABOVE, SEVERELY BURROWED IN PART, THIN BEDS OF BOTH SS & CLYSTN DISRUPTED BY CURRENT ACTION RESULTING IN NODULES OF SS IN CLYSTN & NODULES OF CLYSTN IN SS.
65				
68				

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 2

WELL: WHEEL 1

Interval Cored 4478-4508 ft., Cut 30 ft., Recovered 27 ft., (90 %) Fm. U.K. ?

Bit Type C20, Bit Size 8 5/16 in., Desc. by FEM Date 13 MAR 70

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 6 2			4478-79	SS. LT GR-GN, MED - COSE, SCLCULATIC, PREDOM. RDD, FROSTED Qtz GRAINS WITH 5% MAFICS, 10% CHLORITE SCHIST & 5% WEATHERED FELDSPAR IN A MICAL WHITE KAOLIN MATRIX. GRANULES & PEBBLES OF SOFT, WAXY, LT GR CLAYSTN AT BASE. HIGH ANGLE CROSS BEDDING.
80			4479-86	SS AS ABOVE, MED GRAINED, FAIRLY WELL SORTED, HIGH ANGLE CROSS BEDDING & SLUMP STRUCTURE. BTM 2" IS SLICKE SIDED ALONG A PROBABLE FAULT PLANE WHICH DIPS 40°.
85			4486-92	SS, MED GR, MED AT TOP GRADING DOWNWARD TO CG, PREDOM. RDD, FROSTED Qtz WITH 15% DARK MAFICS, TR BRIGHT GREEN GRAINS & JASPER, SCATTERED GRAM OF LT GR WAXY CLAYSTN, SCATTERED LAMINAE OF REWORKED COAL, MICAL WHITE KAOLIN MTX, MODERATE TO HIGH ANGLE K-BEDS. FAULT PLANE AT BASE DIPS 60° AND TRUNCATES CARBON. LAMIN.
90			4492-4503	SS AS ABOVE, MED AT TOP GRADING DOWNWARD TO COSE - GRANULE WITH SOME PEBBLES OF LT GR-GN CLAYSTONE & GRANULES OF Qtz & WHITE FELDSPAR AT BASE.
95			4503-05	AS ABOVE
00			4505-08	NO RECOVERY
05				
08				









REMARKS:

A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437

CABLE: EXLOGG PERTH

DATE MARCH 13, 1970
DEPTH 4478 TO 4508
GEO-ENGINEER CRAIG CLARKE
CORE: NO. 2

	SAND		LIME
	SILTY SAND		CONGL.
	SILTST.		
	SHALE		

ANALYSIS GRAPH

PERMEABILITY MD. \circ — \circ
150 100 50 0
POROSITY % \times — \times
40 30 20 10 0

WATER SATURATION % PORE \circ — \circ
100 80 60 40 20 0
OIL SATURATION % PORE \times — \times
0 20 40 60 80 100

DEPTH (ft)	PERMEABILITY (MD)	POROSITY (%)	WATER SATURATION (%)	OIL SATURATION (%)
150	150	40	0	100
140	100	30	0	100
130	50	20	0	100
120	10	10	0	100
110	10	10	0	100
100	10	10	0	100
90	10	10	0	100
80	10	10	0	100
70	10	10	0	100
60	10	10	0	100
50	10	10	0	100
40	10	10	0	100
30	10	10	0	100
20	10	10	0	100
10	10	10	0	100
0	1	5	100	0

CORE #1

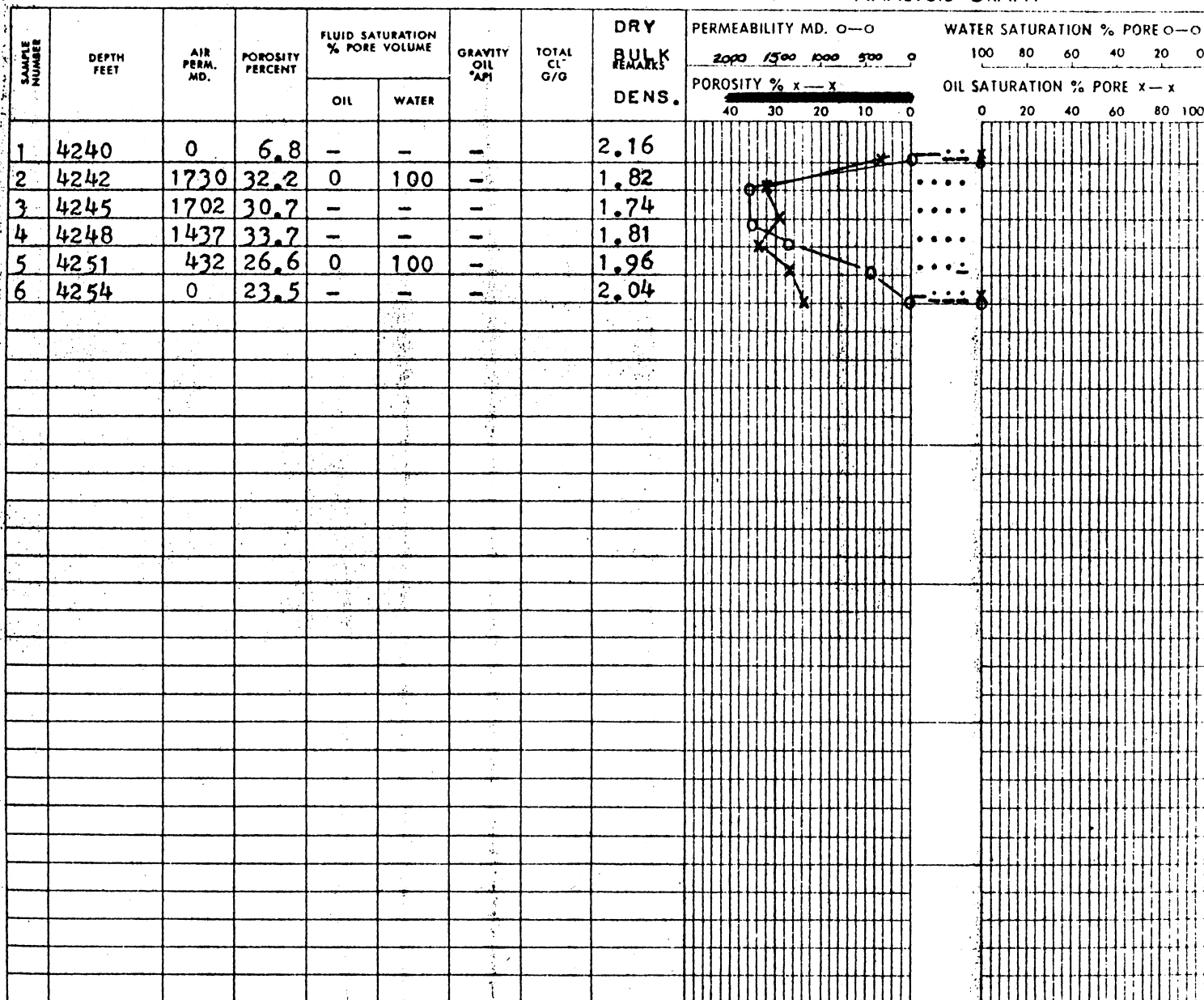
**EXPLORATION LOGGING OF AUSTRALIA, INC.***A Geological-Engineering Service*PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 81 4437 CABLE EXLOGG PERTH**CORE ANALYSIS REPORT**

COMPANY ESSO-8HP
 WELL "WHELK NO. 1"
 LOCATION/FIELD OFFSHORE/OTWAY BASIN
 COUNTY KING ISLAND STATE TASMANIA
 COUNTRY AUSTRALIA

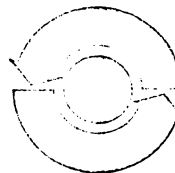
DATE 13 MARCH 1970
 DEPTH 4238 TO 4268
 GEO-ENGINEER CRAIG; CLARKE

REMARKS REGD. 29 FT. SANDST, LT-GY, ALT V FN & MED,
MOSTLY SUBANG, LOCALLY SORTD, PT FROSTED, QTZ W/
ABUND MICA & FEMICS, CARB & PYR NODULES, DIPS TO
15°, X-BED, INTERLAMIN & REWORKED W/CLAYST, DK-GY,
HD, SLTY, OCC SLICKENSIDED, RIPPLE MARKS. NO SHOWS.

SAND ☐ SILTY SAND ☐
 SILTST. ☐ SHALE ☐
 LIME ☐ CONGL. ☐

ANALYSIS GRAPH

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES



PLEASE ADDRESS ALL CORRESPONDENCE TO THE DIRECTOR.

OUR REFERENCE:

MP 3/178/0

YOUR REFERENCE:

10th April, 1970.

The Geologist in Charge,
Esso Standard Oil (Australia) Ltd,
GPO Box 4047,
SYDNEY, N.S.W. 2001

REPORT MP 3595-70

YOUR REFERENCE: Letter dated 1/4/70. 61/jnb.
MATERIAL: One chip sample.
IDENTIFICATION: S29 - Whisk I (1970)
DATE RECEIVED: 6/4/70
WORK REQUIRED: Petrographic description.

Investigation and Report by: S. Whitehead.

Officer in Charge, Mineralogy/Petrology Section: Dr K. Henley.

K. J. Henley

for N. Draper
Director.

BASIC IGNEOUS ROCK FROM EXPLORATORY OIL WELL

WHELK-1 (4795')

Sample: S29: TS C5465.

Rock Name:

Altered analcite basalt.

Hand Specimen:

Small chips of fine grained, grey rock. Six fragments approximately 1 cm in size were mounted and sectioned.

Thin Section:

An optical estimate of the constituents gives the following:

	<u>%</u>
Clinopyroxene	25-30
Chlorite and micaceous alteration products	30-40
Analcite	20-25
Opaque grains (magnetite)	10-15

The rock is porphyritic and some minerals have been extensively altered.

It contains a few fractured remnants of pyroxene phenocrysts up to 1 mm in a finer grained rock now composed of crystals of almost colourless pyroxene (0.03-0.1 mm), crystals of a mineral completely replaced by chloritic minerals (possibly former olivine) and very small crystals of magnetite.

Analcite fills interstices and also occurs as crystals up to 0.1 mm in size with small inclusions of other minerals.

Some chlorite also occurs in interstices and some lines or fills former vesicles.

Minor amounts of late or secondary biotite occur in places, generally associated with iron oxide.

Conclusion:

The chips are probably from an altered basic lava flow.

jjp.1

PALYNOLOGY OF ESSO WHELK NO. 1, OTWAY BASIN

by

P.R. Evans

Palyn. Rept. 1970/8

April 1970.

INTRODUCTION

Samples of cores, sidewall cores and cuttings from Whelk No. 1 were received for palynological examination during March 1970. The following notes summarize the results of study up to 8th April 1970.

All sidewall cores received are listed in the summary of results below. All or a portion of those marked (*) were passed to D.J. Taylor for micropalaeontological examination. However, at the times of writing, Taylor reports that only those at 1606, 991, 1068 and 1125 feet contained microfaunas of significance to age determination.

The results of palynological examination are summarized below and a correlation of Whelk with sections encountered at Mussel to the north and Clam to the south, based on palynological data, is diagrammatically presented in the attached figure.

SUMMARY OF RESULTS

Sample	Depth (ft)	Age	Zone
swc 29*	991	Miocene	H (DJT ident.)
" 27*	1006		
" 26*	1042		
" 25*	1062		
" 22*	1068	Oligocene	I (")
" 24*	1110		
" 20*	1125	"	J (")
" 19*	1162	"	
" 17*	1289	? Oligocene	late <u>N. asperus</u>
" 16*	1385	Eocene	early <u>N. asperus</u>
" 15*	1428	"	" " "
" 14*	1462	"	<u>P. asperopolus</u>
" 13*	1486	"	upper <u>M. diversus</u>
" 12*	1501	"	" " "
" 11*	1552	"	" " "
" 10*	1594	"	" " "
" 9*	1606	Late Paleocene	lower <u>M. diversus</u>
" 7*	1702	"	(also bears unit R benthonic faunas)
" 6*	1712	"	lower <u>M. diversus</u>
" 5*	1759	"	Not processed (sandstone)
" 4*	1804	"	Not processed (sandstone)
" 3*	1842	"	" " "
" 2*	1888	"	" " "
" 1*	1976	"	lower <u>M. diversus</u>
" 30	2060	"	" " "
" 29*	2126	Middle Paleocene	upper <u>L. balmei</u>
" 28	2179	Paleocene undiff.	Not processed (sandstone)
" 27	2250	"	" " "
" 26	2319	"	" " "
" 25	2392	Early-Middle	<u>L. balmei</u>

(continued)

SUMMARY OF RESULTS (continued)

swc 24	2473	Paleocene	
" 23	2526	"	lower L. balmei
" 22	2732	Late Cretaceous	T. lillicoi
" 21	2936	"	" "
" 20	3015	"	" " Not processed
" 19	3116	"	" " Not processed
" 18	3183	"	" " Not processed
" 17	3297	"	" "
" 16	3389	"	N. senectus/ X. australis
" 15	3434	"	" " (Sandstone - not processed)
" 14	3597	"	" "
" 12	3856	"	N. senectus or T. pachyexinus/N. aceras
" 13	3861	"	Not processed (sandstone)
" 11	3964	"	" "
" 10	4089	"	T. pachyexinus/N. aceras
" 9	4123	"	Not processed (sandstone)
" 8	4220	"	" "
Core 1	4248-50	"	" "
swc 7	4290	"	Probably C. triplex
" 6	4427	"	Close to border of C. triplex and
" 5	4488	? Cretaceous	A. distocarinatus.
Core 2	4492	"	Not processed (sandstone)
swc 4	4637	"	" "
" 3	4706	Indeterminate	Fossils present: zone indeterminate
" 2	4784	?pre Mesozoic	Not processed (red shale)
" 1	4795	"	No fossils found.
		"	Not processed (chloritic shale)
		"	No fossils found.

COMMENT

Determination of the Miocene and Oligocene ages are based on foraminiferal data only.

The late N. asperus Zone at 1162 feet bears benthonic foraminifera and very rare dinoflagellates. The latter include Deflandrea phosphoritica. No distinctive Oligocene pollen or dinoflagellates were recognized, but neither were more typical Eocene forms such as S. meridionalis, S. cainozoicus and T. adelaidensis identified.

There appears to be a break between this portion of the N. goniatus Zone and the underlying early N. asperus Subzone, probably represented by most of the Late Eocene section encountered in Mussel (see figure).

The underlying Lower Tertiary is unusual since it provides the best sequence yet known from the early N. asperus Subzone to the L. balmei Zone. Spores and pollen are generally abundant and most samples bear dinoflagellates. The section from the N. asperus to the upper M. diversus Zones contains a sequence of dinoflagellates which appears to be parallel to one through the same interval in the Gippsland Basin. Further study of this interval in Whelk should provide additional means of correlating between the Otway and Gippsland Basins.

The Whelk section demonstrates the change between the lower and upper M. diversus Zones. Whereas it has been and remains difficult to decide where to divide the M. diversus Zone, the reasoning applied to the labels "upper" and "lower" in this report is essentially that used for the Bass Basin (Palyn. Rept. 1970/3). On present knowledge the basal portion of the upper M. diversus Zone at Whelk is a correlate of the Princetown Member of the Dilwyn Formation in the outcropping Princetown section. There appears to be additional section above this horizon in Whelk, representing the younger portions of the upper M. diversus Zone, the P. asperopolus and basal N. asperus subzones which are not recognized in most of the Otway Basin.

The uppermost portion of the M. diversus Zone is characterized by distinctive dinoflagellates which previously have been identified at Flounder in the Lower Eocene of the Gippsland Basin (Palyn. Rept. 1970/2). Samples of apparently comparable age were recognized in Clam No. 1 at 1809 feet (Palyn. Rept. 1969/15) and Mussel at 4208 feet (Palyn. Rept. 1969/18).

The L. balmei Zone is represented by few samples because it is largely a sandy unit, unsuitable for production of good assemblages. However, the upper and lower limits of the zone are satisfactorily identified.

Whelk at 2473 feet is placed in the basal L. balmei Zone to accord with conclusions drawn from a recent, detailed study of the T. lilliei/L. balmei boundary. The same study has shown that Clam No. 1, 2778 feet should also be referred to the basal L. balmei Zone, although previously it was placed at the top of the T. lilliei Zone (Palyn. Rept. 1969/15).

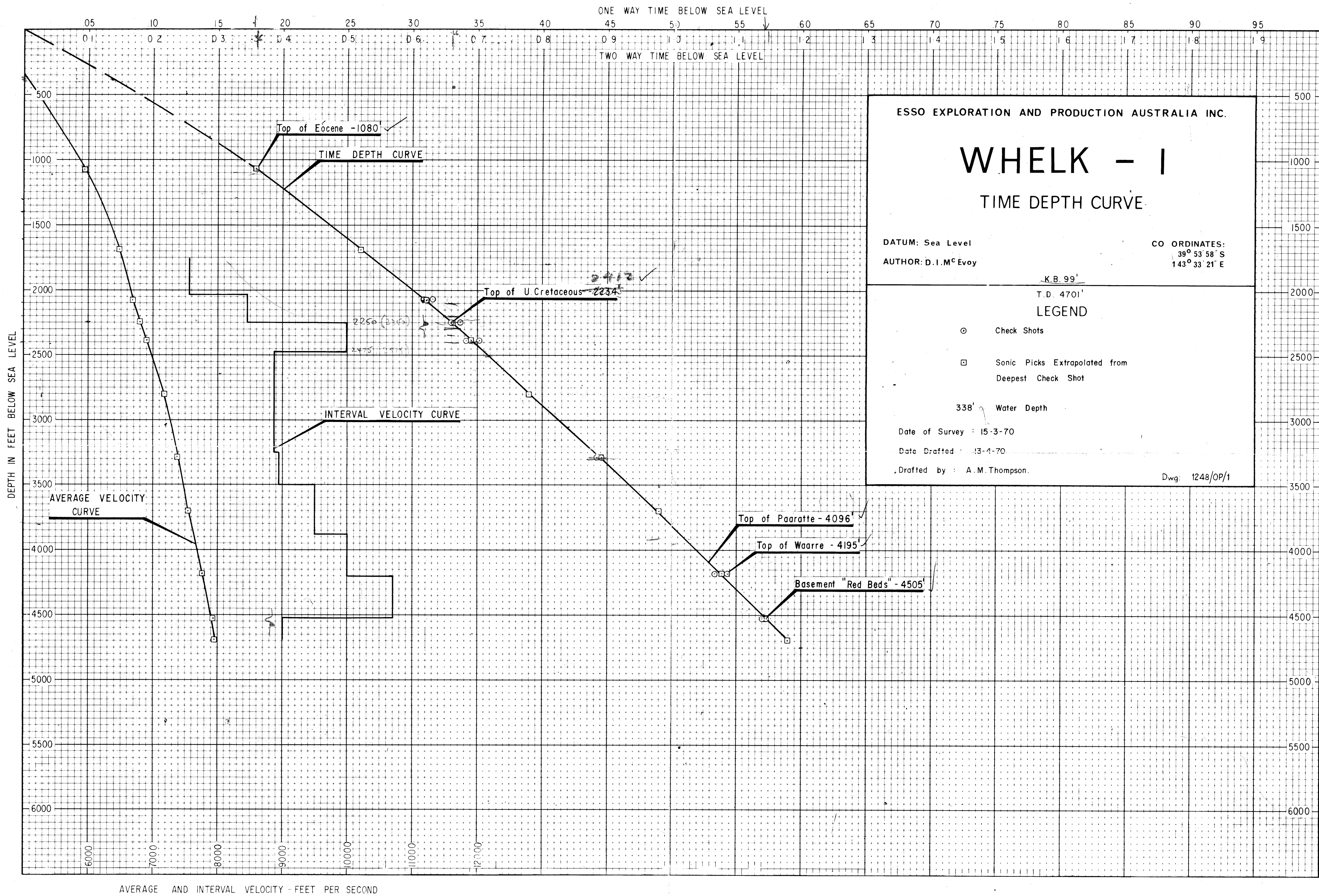
Spores and pollen from the T. lilliei and N. senectus Zones of the Upper Cretaceous were abundant. Dinoflagellates were present in both zones. A form provisionally referred to Defl. korojongensis, present in the T. lilliei Zone at 2526 feet compares

with a similar type reported from Mussel No. 1 4315 feet in D. korojongensis was originally described from Campanian or Lower Maastrichtian of the Korojong Calcarenite of the Carnarvon Basin, Western Australia. Its probable presence in the Otway Basin at the top of the T. lilliei Zone may be further justification for confining the T. lilliei Zone (as presently amended) to the Cretaceous and perhaps for recognizing another dinoflagellate zone above the X. australis Zone and below the "D. pellucida" Zone.

The Late Cretaceous below the N. senectus Zone is less well defined. The dinoflagellate zone of Nelsoniella aceras extends at least as far down as 3954 feet. Thereafter the lack of suitable samples precludes determination of pre-N. aceras horizons with any precision. Horizons at 4248 feet and 4290 feet are probably in the C. triplex Zone.

The only available sample of the sandstone extracted as core 2 and which appeared likely to produce fossils was a plug from 4492 feet, cut for porosity tests and which contained carbonaceous shale fragments. However, the yield was mainly of woody tissue, while the few spores obtained were not definitive of any particular zone within the Upper Mesozoic. No angiosperm pollen were identified among the few fossils observed: the sample could therefore be older than the Upper Cretaceous, but confirmatory data are required.

The sidewall cores from 4706 and 4795 feet yielded no spores or pollen, although translucent sheets of organic tissue were observed in the residue. Such tissues could be of either animal or vegetable origin of any, even Precambrian age. Their presence at least demonstrates that the degree of maturation was not unduly high.



ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

WHELK - 1

TIME DEPTH CURVE

DATUM: Sea Level
AUTHOR: D.I.M. Evoy

CO ORDINATES:
39° 53' 58" S
143° 33' 21" E

K.B. 99'

T.D. 4701'

LEGEND

- Check Shots
- Sonic Picks Extrapolated from Deepest Check Shot
- 338' Water Depth

Date of Survey : 15-3-70

Date Drafted : 13-4-70

Drafted by : A.M. Thompson.

Dwg: 1248/OP/1