



EARLIER FILES	LATER FILES	RECORDS DISPOSITION
PLUGGED & SUSPENDED.	SPUD. 20-6-67. <del>COMPLETED 25-9-67.</del> T.D. 10,011'	38° 23' 58" S 148° 18' 57" E
<b>HALIBUT-1</b>	ESSO. WILDCAT	507. WD 224' RT 31'. GLOMAR III

✓ IES.	Run 1.	750' - 2569'	Separate logs.	2" and 5"
✓ "	" 2.	2515 - 8526.	" "	2" " 5"
✓ "	" 3.	7440 - 8672.	" "	2" " 5"
✓ "	" 4.	8624 - 10,006.	" "	2" " 5"
✓ BHCS/GR.	" 1.	749 - 2559.	" "	2" " 5"
✓ BHCS	" 2.	2515 - 8517.	" "	2" " 5"
✓ "	" 3.	8300 - 8660.	" "	2" " 5"
✓ "	" 4.	8624 - 9997.	" "	2" " 5"
✓ FDC	" 1.	750 - 2567.	" "	2" " 5"
✓ "	" 2.	2516 - 8670.	" "	2" " 5"
✓ "	" 3.	8624 - 10005.	" "	2" " 5"
✓ MLL	" 1.	7450 - 8671.	" "	2" " 5"
✓ LL	" 1.	7450 - 8668	" "	2" " 5"
✓ GRN.	" 1.	7400 - 8100	" "	2" " 5"
✓ CDM.	" 1.	750 - 2565	" "	2" " 5"
✓ "	" 2.	2516 - 8667	only	2"

WELL COMPLETION LOG IN S.K. LAUFENBURGER'S REPORT, FORTSCUE FIELD FILE

✓ Cement Bond Log	Run 1.	5"	7400 - 8624.	
✓ Temperature Log.	" 1.	2"	1000 - 6000.	
X Casing Collar & Perforating Log.				
✓ FIT.	Runs 1 & 2.		Tests 1-8.	
✓ Core Lab. Mudlog.			800' - 10,011'	+ 1/2 c
✓ Completion Coregraph.			cores 2-16.	
✓ Core Analysis Results			2-11 and 13-16. Core Lab.	
— Cores 1-14.		*	VITRINITE REFLECTANCE BY AMOCO.	MAF
— Cores 14, 15 & 16 and dry cuttings			7400 - 10,010.	Received
— Ditch splits			2570 - 7400 cuttings?	Forwarded
— S.W.C. shot 30.	Rec. 14.		no record	4/9/67 W.R.
— "	Rec. 27.		" "	14/8/67 W.R.
✓ Well Discovery Report			Well Summary + 12 core bits	
Hydrocarbon Report			Subsurface Oil. In J. Le Page's office. EPR 67-PS113.	
✓ Velocity survey.		*	ROCK-EVAL DATA SHEET. BY MOBIL OIL AUST.	
X Palynological Report.			Plus revision by A.D. Partridge.	
X Palaeontology Report			by D. Taylor. No SWC descriptions.	
HYDROCARBON REP. - SUBSURFACE OIL. HALIBUT-1				WS07 005
			T.L. 644 7-9-75	
			No GRN R2 5 7400-8100?	

## HALIBUT - 1

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WELL DISCOVERY REPORT

ESSO HALIBUT A-1 WELL SUMMARY

Purpose of Well: New field Wildcat, Gippsland Basin, to test an anticlinal feature mapped by seismic. The Eocene unconformity shows 600 feet of vertical closure, covering an area of 17 square miles. The closure is dependent on the unconformity surface, for the east part of the structure. It is a result of structural dip and erosion by a major canyon filled with sediments of the Lakes Entrance Formation. The upper cretaceous is dependent, as well, on this canyon for east closure. The Lakes Entrance Formation shows 300 feet of vertical closure over an area of 7 square miles. This formation is thinning over the Halibut structure, indicating a late Eocene or early oligocene structural movement. Primary objective was the sand within the Latrobe Valley Formation. Secondary objective was the sand development within the upper cretaceous.

Well Statistics:

Type of Well: Exploratory Test.

Location: Latitude 38° 23' 58" S  
Longitude 148° 18' 57" E  
At seismic shotpoint 8140 Line ET-95

Elevation: Rotary table 31 feet above mean sea level.

Water Depth: 224 feet.

Spudded: June 20, 1967.

Completed: September 25, 1967.

Total Depth: 10,011 feet.

Well Status: Plugged and suspended.

Casing: 30" to 376 ft.  
20" to 746 ft.  
13<sup>3</sup>/<sub>8</sub>" to 2515 ft.  
9<sup>5</sup>/<sub>8</sub>" to 8624 ft.

Perforations: 7800 - 7804 ft. 2 shots/ft.  
7890 - 7894 ft. 2 shots/ft.

Plugs: 1. Casing plug at 8450-8750 ft., using 127 sacks of Aust. N. Cement, 0.4% NR4, 0.75% CFR2, 15.6 lbs/gallon.  
2. 2300-2600 ft., using 100 sacks of cement, 15.4 lbs/gallon.  
3. 490-290 ft.

Cores: 1 core at 5500-5523 ft.  
15 cores in the interval 7550-7960 ft.  
Cut 433 ft., recovered 310.5 ft.

Mud Log: The well was logged by Core Laboratories  
from 800 feet to total depth.

Electric Logs:

IES	750 - 10006 ft.
MLL	7450 - 8670 ft.
LL	7450 - 8668 ft.
BHC-SGR	749 - 9997 ft.
GRN	7400 - 8100 ft.
CDM	750 - 8667 ft.
FDC	750 - 10005 ft.
TL	1000 - 6000 ft.
CBL	7400 - 8624 ft.

Hydrocarbons:

<u>Interval</u>	<u>Gross</u>	<u>Net</u>	<u>Type</u>
7490-7905 ft.	415 ft.	311 ft.	Oil

Testing:

Wire Line Formation Tests:

Test 1. 7948 ft.  
Recovered:- 19900 cc water with a salinity  
of 14,000 ppm (15% formation water and 85%  
filtrate); 600 cc mud.  
RW = 0.527 at 67° F.

Test 2. 7911 ft.  
Seal failure.

Test 3. 7893 ft.  
Mechanical failure.

Test 4. 7893 ft.  
Recovered:- 20.050 cc of water with a  
salinity of 6300 ppm (filtrate),  
400 cc mud.  
RW = 1.06 at 69° F.

Test 5. 7786 ft.  
Recovered:- 12,750 cc oil, A.P.I. 41.5°,  
5500 cc water (filtrate), salinity 4900 ppm.  
500 cc mud.  
RW = 1.51 at 61° F.

Test 6. 7690 ft.  
Recovered:- 800 cc oil, 17,900 cc water  
(filtrate), with salinity 3500 ppm;  
1500 cc mud.  
RW = 1.47 at 83° F.

Test 7. 7912 ft.  
Recovered:- 20,000 cc water (filtrate),  
salinity 4500 ppm; 500 cc mud;

trace of gas, scum of oil.  
RW = 1.65 at 66° F.

Test 8. 7565 ft.  
Recovered:- 3000 cc oil, A.P.I. 38°;  
11,000 cc water (filtrate), salinity 4500  
ppm; 400 cc mud.  
RW = 1.62 at 60° F.

Production Testing:

Zone 1. 7890 - 7894 ft.  
Bad weather and mechanical problems hampered testing of this interval, which then had to be abandoned.

Zone 2. 7800 - 7804 ft.  
Packer was set at 7730 ft. The interval was perforated and the well flowed at rates up to 3230 B.O.P.D. through a ½" choke.  
Gravity - 43.8° A.P.I.; sand = nil, water = nil; wax = nil, G.O.R. = nil, FBHP = 3494 p.s.i.; SIBHP = 3623 p.s.i.

Stratigraphy:

<u>Age</u>	<u>Formation</u>	<u>Top (RT)</u>	<u>Subsea</u>	<u>Thickness</u>
Miocene	Gippsland Fm.		- 224	
Oligocene	Lakes Entrance Fm.	7010	-6979	480
Eocene	Latrobe Valley Fm.	7490	-7459	2521 +
	O.W.C.	7905	-7874	
	T.D.	10011	-9980	

Lithology:

Gippsland Formation

800 - 5611 Interbedded marl and limestone.  
Limestone: skeletal, granular,  
Marl: grey, silty, very fossiliferous, partly grading to micritic limestone.  
Thin beds of shaly sand and siltstone.

5611 - 7010 Calcareous mudstone:  
Soft, fossiliferous, dense, glauconitic, trace of argillaceous, calcareous siltstone, Some skeletal limestone, coarse, granular, glauconitic.  
(5750 - 5760: argillaceous dolomite.)

Lakes Entrance Formation

7010 - 7490 Calcareous mudstone: soft, dense, fossiliferous, glauconitic.  
Calcareous shale; grey, fairly well compacted, micaceous, fine carbonaceous flecks.

Latrobe Valley Formation

7490 - 7597

Interbedded sandstone, siltstone, shale and coal.

Sandstone: brown, grey, loose quartz grains, fine to very coarse, rounded to subrounded, poorly sorted, clay matrix, micaceous. Also aggregates of sandstone, fine well sorted, argillaceous.

Shale: grey, carbonaceous.

Coal: black.

Siltstone: dark brown, micaceous.

7597 - 7786

Quartz-wacke - Quartz-arenite, interbedded with shale. Some shaly sandstone with clay matrix.

Quartz-wacke: medium to coarse, subangular, tight, silty. Partly bonded, unconsolidated, friable.

Shale: brown-grey, reworked, pyritic, fissible, micaceous, carbonaceous.

7786 - 8700

Interbedded sandstone, shale and coal.

Sandstone: moderately well sorted, fine to medium, subrounded to subangular, shaly, silty.

Shale: grey, silty, sandy, partly calcareous, carbonaceous.

8700 - 9390

Interbedded shale, siltstone, sandstone, coal and some white clay.

Sandstone: coarse to pebbly, granular quartz, pyritic, subangular.

Siltstone: grey-brown.

White clay: soft, ashy, crumbly, with pyrite.

Shale: brown, carbonaceous.

9390 - 10,011 (T.D.)

Interbedded shale, sandstone and coal.

Shale: brown, silty, carbonaceous.

Sandstone: grey, fine to very fine, tight, carbonaceous, argillaceous. Also loose quartz, coarse to very coarse, subangular (with asphalt stains).

Some coal, some white clay.

Ex. Hafenbrack, J.H. 1957. APE JOURNAL 1109 20146-58

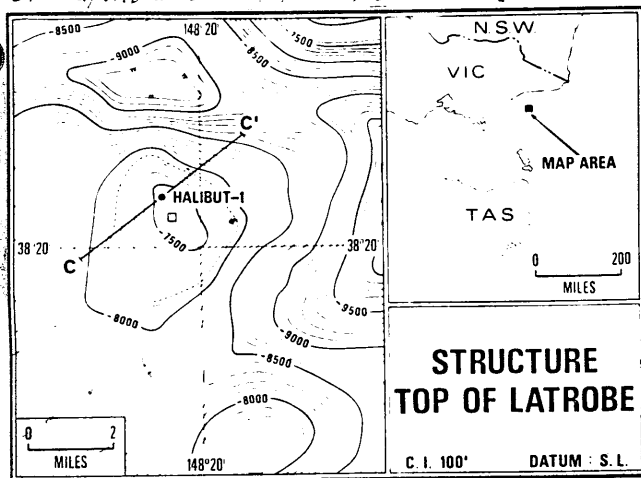


FIGURE 6

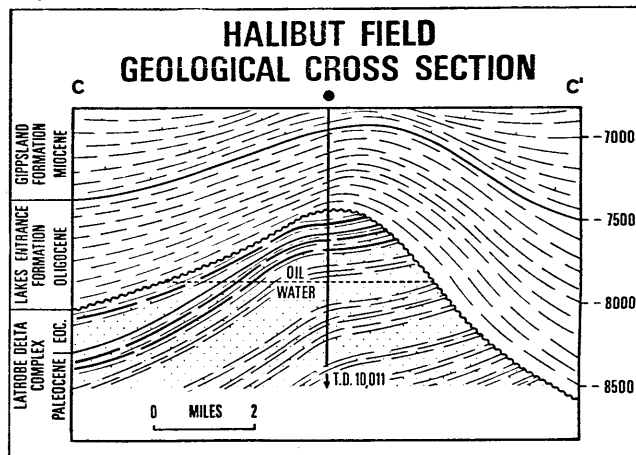


FIGURE 7

Fig 6 it. origin is an unconformity - considerably modified & post-Eocene erosion dominated by Oblique clarity.

Approx 600' vertical column & cover area 117 square miles

Gross oil column 410 feet & 298 feet of net pay. No gas caps.

Oil reservoir consists of Eocene and Paleocene sand bodies

Case estimate recoverable proven & probable reserves of oil to be about 440 million barrels.

Seals Gas  $13 \times 10^9$  cu ft.



2. Lithology

HALIBUT NO. 1 WELL

2565' - 3020'	<u>Marl</u> , light medium grey, very silty, very fossiliferous.
3020' - 4107'	<u>Marl</u> , few stringers of limestone.
4107' - 4597'	<u>Marl</u> , grading to <u>limestone</u> , light grey - light brown, silty, micritic skeletal.
4597' - 4700'	<u>Limestone</u> , as above.
4700' - 4891'	<u>Marl</u> , as above.
4891' - 5500'	<u>Marl</u> with few stringers of limestone.
5500' - 5523'	Core No. 1. Rec. 21' <u>Shaly limestone</u> and sandy siltstone with thin bands of dark grey calcareous shale.
5523' - 5611'	<u>Marl</u> and <u>limestone</u> .
5611' - 5800'	<u>Calcareous mudstone</u> , and <u>skeletal limestone</u> .
5800' - 6190'	<u>Calcareous mudstone</u> .
6190' - 6240'	<u>Calcareous mudstone</u> , traces of argillaceous siltstone.
6240' - 6250'	<u>Limestone</u> .
6250' - 6971'	<u>Calcareous mudstone</u> .
6975' - 7400'	<u>Calcareous mudstone</u> , pyritic, fossiliferous, soft, becoming shaley and firm downwards.
7400' - 7470'	<u>Calcareous shale</u> , grey, green, fairly well compacted, sub-fissile, micromicaceous, fine carbonaceous flecks, pyritized fossil fragments.
7440' - 7490'	<u>Shale</u> as above.
7490' - 7500'	75' <u>Coal</u> , black with some quartz grains and 25' soft, silty sandstone. Sandstone, has light yellow fluorescence.
7500' - 7510'	50' <u>Coal</u> .
7510' - 7523'	10' Fine grained <u>sandstone</u> .
7510' - 7523'	30' <u>Coal</u> .
7510' - 7523'	40' <u>Siltstone</u> .
7510' - 7523'	30' Fine grained <u>sandstone</u> .
7530' - 7550'	<u>Coal</u> , black, brittle and splintery, interbedded with carbonaceous shale and dark brown micaceous siltstone.
7530' - 7550'	20' <u>Sandstone</u> , loose quartz grain, fine - very coarse, rounded to subrounded. Aggregate sandstone, fine grained, well sorted, argillaceous.
7550' - 7573'	Core 2. Rec. 17' 6' Shale bands, interbedded coal. 11' Oil Sand, dirty, <del>ill</del> sorted, <del>argillaceous</del> . silty, moderate - low porosity and permeability. Av. Por. 22 - 23% D.K. 2.5 D.

7573' - 7597'

Core 3. Rec. 5½'.

Top 2': Sandstone, light brown, poorly sorted, subrounded to angular, clayey matrix, slightly micaceous. Rough bands due to grain size variations.

3': Sandstone with interbedded laminae of carbonaceous shale, sandstone as above.

7597' - 7623'

Core No. 4. Rec. 20'

Interbedded tight silty sandstone and shale.

7623' - 7649'

Core No. 5. Rec. 16'

Interbedded tight silty sandstone and shale, grades to well sorted sand at base.

7469' - 7673'

Core No. 6. Rec 21'.

12' of Shale (reworked shale).

9' of tight silty sandstone.

7673' - 7706'

Core No. 7. Rec. 25' - 25 - 30% Porosity:

K = 1840-62,000 M.D.

25' Sandstone, massive, medium - coarse, excellent porosity and permeability.

7706' - 7733'

Core No. 8. Rec. 30'

13' of previous core.

Good sand with some banded silty sandstone.

7733' - 7763'

Core No. 9. Rec. 30'.

7' of Sandstone.

23' of Silty sand and interbedded shale.

7763' - 7790'

Core No. 10.

7790' - 7820'

Core No. 11. Rec. 4'.

4' Gravelly and silty sandstone.

7820'

7852' - 7882'

Core 13. Rec. 30'.

7852' - 7865'

Black Shale.

7865' - 7877'

Sandstone, very fine grained, poor porosity and permeability.

7877' - 7882'

Shale, sandy in part.

7882' - 7912'

Core No. 14. Rec. 18'.

18' recovered 3' of wet sand with good porosity and permeability. Remainder shale with two streaks of coal.

7912' - 7930' Core No. 15. Rec. 5'.  
2' of Shale.  
3' of Sand.

7930' - 7960' Core No. 16. Rec. 24'.  
No shale, all sandstone, very fine at top  
and grades down.  
Top 11' have clayey, silty matrix.  
Bottom 13' have good porosity and permeability  
and no oil.

7960' - 8025' 60% quartz and 40% Shale.  
8020' - 8090' Sandstone, good porosity and permeability.  
No shows.

8090' - 8160' Shale, medium grey.  
8160' - 8170' Sandstone.  
8170' - 8222' Sandstone.  
8222' - 8363' Interbedded sandstone, shale and coal. Minor  
Sandstone.

8363' - 8479' Interbedded sandstone, shale and coal. Minor  
Sandstone.

8670' - 8680' Sandstone.  
8680' - 8700' Coal.  
8700' - 8710' Siltstone.  
8710' - 8800' Sandstone.  
8800' - 8810' Coarse gravel quartzose, little pyrites.  
8810' - 8860' Coarse gravel sandstone, more shaly in last  
few feet.

8870' - 8880' Coal.  
8920' - 8930' Very coarse pebbly sandstone.  
8930' - 9255' Mostly sandstone, granule - coarse, clear,  
frosted, no cement, soft white clay about 40'.  
Ashy appearance, bedded appearance.

958' - 9623' 70' Loose coarse quartz grains, no cement.  
30' Sandstone, fine grained, tight, cemented  
with calcareous material. trace white clay.

9610' - 9630' Loose quartz sand grains, coarse to very coarse,  
minor fine grained sandstone, hard, tight,  
calcareous cement, minor clay.

9630' - 9670' Coal, minor sandstone as above, some white clay  
and some carbonaceous shale.

9670' - 9740' Shale and sandstone interbedded, medium brown,  
carbonaceous, silty. Sandstone, non calcareous,  
light grey, fine, argillaceous and cemented.

Perforated 7890' - 7894' No flow.  
Swabbed to 500 feet & got 25 gallons of oil.

### 3. Core, Mud and Cutting Analysis

CORE, MUD AND CUTTINGS ANALYSIS

FOR

ESSO EXPLORATION AUSTRALIA INC.,

GIPPSLAND SHELF NO. 1 WELL

WILDCAT

VICTORIA, AUSTRALIA

BY

CORE LABORATORIES AUSTRALIA (VIC) LTD.

# CORE LABORATORIES AUSTRALIA (VIC.) LTD.

*Petroleum Reservoir Engineering*

BRISBANE, AUSTRALIA

G.P.O. BOX 664K

CABLE: CORELAB

PHONE: 58-1315

31st May, 1965

ESSO EXPLORATION AUSTRALIA INC.,  
BOX 4047, G.P.O.,  
SYDNEY. N.S.W.

ATTENTION: MR. A.A. PHILLIPS.

SUBJECT: CORE, MUD AND CUTTINGS ANALYSIS  
GIPPSLAND SHELF NO. 1 WELL,  
WILDCAT,  
VICTORIA, AUSTRALIA.

GENTLEMEN:

A CORE LABORATORIES AUSTRALIA combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 767 feet to total depth of 8701 feet.

Using standard equipment plus a Programmed Hydrocarbon Detector (rapid sampling gas Chromatograph) the drilling fluid was monitored continuously for hydrocarbon content and the drill cuttings were checked at regular intervals for gas and oil content and lithology. All core analysis was performed by conventional procedures. The results of these operations are shown on the accompanying Grapholog and Coregraph. Core descriptions are shown on the Grapholog.

Hydrocarbon Shows and Core Analysis:

There were no shows of gas or oil from 767 to 3450 feet. From 3450 through 3800 feet we logged high mud gas readings consisting primarily of Methane with some Ethane, Propane, and Butane. Cuttings gas readings were generally low during this interval suggesting a highly permeable reservoir.

From 4800 to 6109 feet samples were generally poor and the gas increases in this interval might be worth further testing if found to be from sand sections. The gas increases from 6550 to 6575 feet and 7825 to 7860 feet appear to be significant and worthy of further investigation. All gas increases from 7860 feet to total depth appear to be of Coal and Siltstones origin.

Good oil fluorescence was only noted in one half foot from 8692 $\frac{1}{2}$  to 8693. This sample gave an excellent cut in Carbon-tetra chloride however, core analysis indicated low permeability.

We sincerely appreciate the opportunity to have been of service and trust that the information furnished in this report and during drilling operations has assisted the evaluation of this well.

Very truly yours,  
CORE LABORATORIES AUSTRALIA (VIC) LTD.

*Joe B. McAdams*

JOE B. MC ADAMS,  
RESIDENT MANAGER



CORE, MUD AND CUTTINGS ANALYSIS  
FOR

ESSO STANDARD OIL (AUSTRALIA) LTD.

HALIBUT A-1 WELL (OFFSHORE)

WILDCAT  
VICTORIA, AUSTRALIA

BY

CORE LABORATORIES AUSTRALIA (VIC.) LTD.

# CORE LABORATORIES AUSTRALIA (VIC) LTD.

*Petroleum Reservoir Engineering*

BRISBANE, AUSTRALIA

28 September, 1967

G.P.O. BOX 664 K  
CABLE: CORELAB  
PHONE: ~~55-4335~~ 5-3222

ESSO STANDARD OIL (AUSTRALIA) LTD.,  
G. P. O. Box 4249,  
SYDNEY, NEW SOUTH WALES. 2001

ATTENTION: MR. JOHN ELLIOTT.

SUBJECT: CORE, MUD AND CUTTINGS ANALYSIS  
ESSO HALIBUT A-1 WELL,  
WILDCAT,  
VICTORIA.

**RE-NAMED  
(AUG. 1968)  
HALIBUT 1**

GENTLEMEN:

A CORE LABORATORIES AUSTRALIA combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 800 Feet to the total depth of 10,011 feet.

Utilising standard equipment plus a Programmed Hydrocarbon Detector (Sampling Gas Chromatograph), and a Beckman GC-1 Gas Chromatograph (H<sub>2</sub>S and CO<sub>2</sub> Detector), the drilling fluid was monitored continuously and the drill cuttings were checked at regular intervals for gas and oil content and lithology. In addition, a Shale Density kit was utilised to determine density of shale and similar sediments. All core analysis was performed by conventional procedures. The results of these operations are shown on the accompanying Grapholog and Coregraph.

Hydrocarbon Shows. Local increases in Methane and Carbon dioxide were recorded in the higher sections of the well.

A major hydrocarbon zone was first encountered between 7,490' and 7,500', and extended to 7,960'. Heavy hydrocarbons up to C<sub>4</sub> were encountered in the higher portions of the zone, but were of relatively low concentrations. Good yellow-blue fluorescence was observed in the sand portions of the zone to 7,917'. An immediate streaming cut was obtained throughout the entire portion of the zone exhibiting fluorescence. As a matter of interest, a heavy hydrocarbon C<sub>2</sub> was observed in conjunction with a coal seam at 9,870'. No other coal seams were found to have hydrocarbons other than Methane.

Core Analysis. Core Analysis of the zone 7,550' to 7,954' indicated satisfactory reservoir conditions, with a reasonably good oil saturation. Exceptionally high permeability measurements in Core No. 16 (7,390' - 7,960') are thought to be unrepresentative of reservoir conditions, as the sand in this high permeability area was extremely friable.

We sincerely appreciate the opportunity to have been of service, and trust that the information furnished in this report and during drilling operations has assisted in the evaluation of this well.

Yours very truly,  
CORE LABORATORIES AUSTRALIA (VIC) LTD.  
*Jerry C. Carey*  
JERRY C. CAREY,  
ACTING MANAGER.

*Received at Russell St 20<sup>th</sup> Oct*

*Mr Whiting*

*23/10*

HALIBUT - 1

File Halibut ✓  
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CORE LABORATORIES, INC.  
Petroleum Reservoir Engineering  
DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
Well HALIBUT 8-1 Core Type DIAMOND Date Report 20 JULY 67  
Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts TM RS  
County AUST. State VIC. Elev. 31'KB Location \_\_\_\_\_

Lithological Abbreviations

SAND - SD SHALE - SH LIME - LM	DOLOMITE - DOL CHERT - CH GYPSUM - GYP	ANHYDRITE - ANHY CONGLOMERATE - CONG. FOSSILIFEROUS - FOSS	SANDY - SDY SHALY - SHY LIMY - LMY	FINE - FN MEDIUM - MED COARSE - CSE	CRYSTALLINE - XLN GRAIN - GRN GRANULAR - GRNL	BROWN - BRN GRAY - GY VUGGY - VGY	FRACTURED - FRAC LAMINATION - LAN STYLOLITIC - STY	SLIGHTLY - SL/ VERY - V/ WITH - W/
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS		
				OIL	TOTAL WATER			

CORE No. 2 CUT 7550' - 7578' REC. 17'

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
	7550	290	11.5	14.8	63.5	SH. GY-BRN, MICRO MIC. SS. LT. GY-LT BRN, FN-MED GRN.
2	7552	....	24.5	15.5	55.5	SS. LT GY-LT BRN, MED GRN, SUB RND, CLAY MATRIX, SL/PYR.
3	7554	1695	23.8	9.2	60.9	" " " " " "
4	7555	5700	24.8	16.9	45.6	" " " " " "
5	7557	116	17.6	10.2	50.8	" " " " " "
6	7559	2490	24.0	7.9	52.1	" " " " " "
7	7561	610	24.9	9.0	55.0	" " " " " " (W/MORE FN GRN SD AND CLAY)
8	7563	2562	22.8	17.5	48.2	SS LT GY-LT BRN, MED GRN, SUB RND,
9	7565	1728	22.6	11.7	48.8	SS MED GY-BRN, MED GRN SUB RND.
10	7567	2462	21.3	8.5	57.7	SS MED GY-BRN, FN-V/CRSE GRN, SUB RND-RND.

NOTE: - SAMPLE No. 1 DEVELOPED FRACTURES IN SHALE WHILE DRYING, GIVING HIGH SHALE PERMEABILITY.  
SAMPLE No. 2 PERMEABILITY SAMPLE BROKE UP DURING PERMEABILITY TEST.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, they are made. The analyses, opinions or interpretations expressed represent the best judgment of Core Laboratories, Inc. (All errors and omissions are hereby disclaimed.) Core Laboratories, Inc. and its employees assume no responsibility and make no warranty or representation, as to the production or non-production of hydrocarbons from any well or field or other use of said information in connection with which such report is used or relied upon.

## CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIGUT A-1 Core Type DIAMOND Date Report 21 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER Analysts TM RS  
 County AUST. State WIC. Elev. 31' KB Location \_\_\_\_\_

## Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
						SAND - SD SHALE - SH LIME - LM DOLOMITE - DOL CHERT - CH GYPSUM - GYP ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSILIFEROUS - FOSS SANDY - SDY SHALY - SHY LIMY - LMY FINE - FN MEDIUM - MED COARSE - CSE CRYSTALLINE - XLN GRAIN - GRN GRANULAR - GRNL BROWN - BRN GRAY - GY VUGGY - VGY FRACTURED - FRAC LAMINATION - LAM STYLOLITIC - STY SLIGHTLY - SL/ VERY - V/ WITH - W/

## CORE No. 3 CUT 7578' - 7597' REC. 6'

	7579	1442	23.8	16.8	57.6	SS. LT-MED BRN, MED-CRSE GRN.
12	7580	385	24.6	13.8	49.3	SS " " " "
13	7581	313	27.1	14.0	48.3	SS " " " "
14	7582	260	23.9	14.2	49.8	SS " " " "
15	7583	43.4	24.4	16.8	55.7	SS LT-MED BRN, FN-MED GRN, SILTY.
16	7584	20.0	24.7	14.2	54.6	SS " " " FN GRN, SILTY.

**CORE ANALYSIS RESULTS**

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 21 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts TM RS ES  
 County AUST. State VIC. Elev. \_\_\_\_\_ Location \_\_\_\_\_

**Lithological Abbreviations**

SANDY SS SHALE SH LIME LM	DOLOMITE DOL CHERT CH GYPSUM GYP	ANHYDRITE ANHY CONGLOMERATE CONG FOSSILIFEROUS FOSS	SANDY-SDY SHALY-SHY LIMY-LMY	FINE FN MEDIUM-MED COARSE CSE	CRYSTALLINE XLN GRAIN GNN GRANULAR GRNL	BROWN BRN GRAY-GY YUGGY-VGY	FRACTURED FRAC LAMINATION LAM STYLOLITIC STY	SLIGHTLY-SL/ VERY-V/ WITH-W/
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

**CORE NO. 4 7597'-7623' REC. 18'**

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	OIL	TOTAL WATER	DESCRIPTION
18	7598	21.6	18.05	13	47.3	SS LT-MED GY, FN GRN, SILTY.
18	7601	139.5	21.2	12.7	47.2	SS " " "
19	7602	2233.0	18.1	13.3	46.4	SS " " "
20	7603	2178.0	20.3	11.2	47.1	SS " " "
21	7604	31.3	20.3	15.1	45.2	SS " " "
22	7605	61.8	20.7	15.0	45.8	SS " " "
23	7606	172.6	22.8	17.1	43.8	SS " " "
24	7609	* 425.0	7.3	0.0	89.0	SS " " "V SHALY
25	7613	125.0	21.8	16.5	46.8	SS " " "
26	7616	541.0	15.6	9.0	48.1	SS " " "

\*FRACTURED

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**CORE ANALYSIS RESULTS**

Company **ESSO STANDARD OIL** Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well **HALIBUT A-1** Core Type **DIAMOND** Date Report **22 JULY 67**  
 Field **WILDCAT** Drilling Fluid **FRESH WATER GEL** Analysts **TM RS ES**  
 XXXX **AUST.** State **VIC** Elev **31' KB** Location \_\_\_\_\_

**Lithological Abbreviations**

ANHYDRITE ANHY	SANDY SS	FINE FN	CRYSTALLINE SL	BROWN BRN	FRACTURE, FRA	CLAYE SL
CONGLOMERATE CONG	SHALY SHY	MEDIUM MED	SHA N GRN	GRAY GY	LAMINATION LAM	CLAYE V
FOSSILIFEROUS FOSS	LIMY LMY	COARSE CRSE	GRANULAR GRN	VUGGY VGY	STY. OLIT. C. STY	WITH W

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
<b>CORE No. 5 7623-7648' REC. 16'</b>						
27	7623	268.0	17.8	6.2	58.2	SS LT-MED GY, FN GRN, SILTY.
	7625	132.6	19.1	11.5	54.0	SS " " "
29	7627	2.1	16.2	11.7	53.1	SS LT-MED GY, FN GRN, SILTY, PYRITIC.
30	7631	1.9	18.0	10.5	60.0	SSAS ABOVE W/SH LAMINATIONS
31	7636	10.1	11.0	7.3	61.0	SS MED-DK GY, MED-CRSE GRN, SILTY.
32	7637	*4023.0	22.8	5.7	59.7	SS CRSE-V/CRSE, FRIABLE, PYR.
33	7639	120.4	22.1	8.1	56.6	SS " " " "

\*FLUSHED AND CONTAMINATED WITH DRILLING MUD.

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## CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 22 JULY, 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts RS. TM. ES  
~~xxxxx~~ AUSTRALIA State VIC. Elev. 31'KB Location \_\_\_\_\_

## Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
<u>CORE NO. 6 7649-7678' REC. 21'</u>						
34	7649	0.60	11.5	5.2	80	SS, DK GY V/CSE-FN GRN SHALY
35	7660	*3102.7	16	6.9	71.4	SS, BRN-GY CSE TO FN GRN SILTY
36	7661	5.7	10.9	10.1	72.5	SS, DK GY CSE SILTY
37	7663	6.3	15.3	5.9	79.2	SS, DK GY V/CSE TO FN
38	7665	14.0	8.5	10.6	73	SS, DK GY CSE TO FN SILTY
39	7667	805.4	17.2	9.3	53.5	SS, DK GY V/CSE TO FN FRIABLE
40	7669	780.6	28.1	10.7	40.5	SS, BRN GY MED TO FN GRN FRIABLE

\* FRACTURED PERM PLUG , ABNORMALLY HIGH READING.

CORE ANALYSIS RESULTS

Company: ESSO STANDARD OIL  
Well: HALIBUT A-1  
Field: WILDCAT  
XXXXX AUST. Spec. VIC.  
Formation: Core Type: DIAMOND  
Drilling Fluid: FRESH WATER GEL  
File: Date Report: 23 JULY 67  
Analysis: TM RS ES  
Loc: 31' KB

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

CORE No. 7 7678' - 7706' REC. 25'

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	OIL	TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
41	7679	1842	28.3	11.7	43.8	SS LT-MED GY-BRN, FN-MED GRN, FRIABL
42	7680	1720	25.1	13.5	57.0	SS " " " " "
43	7681	2455	26.8	14.0	54.0	SS " " " " "
44	7682	2605	27.7	14.1	50.2	SS " " " " "
45	7684	5515	29.2	12.7	53.1	SS " " " " "
46	7687	2717	25.7	11.5	44.6	SS " " " " "
47	7689	4210	28.4	14.8	57.6	SS " " " " "
48	7691	4210	28.8	13.0	60.5	SS " " " " "
49	7693	4023	29.1	15.5	54.0	SS " " " " "
50	7695	5868	27.0	15.4	55.6	SS " " " " "
51	7697	5515	26.9	12.6	57.6	SS " " " " "
52	7699	6240	28.0	14.8	52.0	SS " " " " "
53	7700	2605	28.6	12.9	57.0	SS " " " " "
54	7702	5868	29.2	12.7	45.9	SS " " " " "
55	7703	4023	27.4	14.4	59.2	SS " " " " "

97.76  
28

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## CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 24 JULY, 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts RS TM ES  
~~Core No.~~ AUST. State VIC. Elev. 31'KB Location \_\_\_\_\_

## Lithological Abbreviations

SAND - SD      DOLOMITE - DOL      ANHYDRITE - ANHY      SANDY - SDY      FINE - FN      CRYSTALLINE - XLN      BROWN - BRN      FRACTURED - FRAC      SLIGHTLY - SL/  
 SHALE - SH      CHERT - CH      CONGLOMERATE - CONG      SHALY - SHY      MEDIUM - MED      GRAIN - GRN      GRAY - GY      LAMINATION - LAM      VERY - V/  
 LIME - LM      GYPSUM - GYP      FOSSILIFEROUS - FOSS      LIMY - LMY      COARSE - CSE      GRANULAR - GRNL      VUGGY - VGY      STYLOLITIC - STY      WITH - W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

CORE NO. 8 7706' - 7733' REC. 30'

56	7706	*	28.9	14.2	49.5	SS, BRN-GY MED COARSE GRN
57	7707	*	24.8	16.5	58.5	" " "
58	7708	*	28.8	16.5	55.0	" " "
59	7709	5868	25.2	13.5	55.5	" " "
60	7711	*	25.0	13.2	51.6	" " "
61	7712	*	25.8	14.7	50.3	" " "
62	7713	*	28.0	16.4	55.7	" " "
63	7714	1805	24.9	12.1	53.1	" " "
64	7717	3277	29.2	17.4	54.2	" " "
65	7718	*	26.1	14.5	55.2	" " "
66	7721	*	27.6	16.3	55.1	" " "
67	7722	1105	19.8	16.1	53.0	SS, GY FN-MED GRN
68	7724	5868	25.1	19.1	48.6	SS, GY MED CRSE GRN
69	7725	328	20.0	12.0	54.5	SS, GY FN-GRN, SHALY
70	7727	147.5	25.5	10.6	44.3	SS, GY MED CRSE
71	7728	13.9	14.9	6.7	49.7	SS, GY MED CRSE, SHALY
72	7729	177.1	22.9	13.6	48.4	SS, GY FN-MED GRN
73	7733	7.4	23.6	14.0	49.6	SS, GY FN-MED GRN, SHALY

\*SAMPLES TOO FRIABLE FOR PERMEABILITY MEASUREMENT

NOTE. ALL SAMPLES SHOWING GOOD  
ODOR AND FLUORESCENCE.

## CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 24 JULY, 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts TM ES RS  
 County AUST. State VIC. Elev. 31 KB Location \_\_\_\_\_

### Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS		
				OIL	TOTAL WATER			
SAND - SD SHALE - SH LIME - LM	DOLOMITE - DOL CHERT - CH GYPSUM - GYP	ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSILIFEROUS - FOSS	SANDY - SDY SHALY - SHY LIMY - LMY	FINE - FN MEDIUM - MED COARSE - CSE	CRYSTALLINE - XLN GRAIN - GRN GRANULAR - GRNL	BROWN - BRN GRAY - GY VUGGY - VGY	FRACTURED - FRAC LAMINATION - LAM STYLOLITIC - STY	SLIGHTLY - SL/ VERY - V/ WITH - W/

CORE NO. 9 7733' - 7763' REC. 30'

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	OIL	TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
74	7734	1442	25.6	15.2	48.8	SS, LT GY-BRN MED TO CRSE GRN MIC
75	7735	82.6	18.8	9.6	45.7	SS, LT MID GY MED GRN CARB STREAK
76	7736	1010	23.6	14.8	50.4	SS, LT MID GY FN TO MED GRN
77	7737	1510	25.9	12.7	47.2	SS, " " " " " " "
78	7738	1180	26.4	15.5	44	SS, " " " " " " "
79	7745	3.6	18.9	7.4	60.9	SS, MID GY FN GRN SILTY
80	7755	1.3	16.2	8.7	59.9	SS, " " " " " SHALY

NOTE: WAXY RESIDUE IN RETORT SAMPLES 79 & 80

7-3

**CORE ANALYSIS RESULTS**

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 25 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts RS  
 County AUST. State VIC. Elev. 31'KB Location \_\_\_\_\_

**Lithological Abbreviations**

SAND-SD SANDY-SN SANDY-M	DOLOMITE-DOL CHERT-CH GYPSUM-GYP	ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS	SANDY-SDY SHALY-SHY LIMY-LMY	FINE-FN MEDIUM-MED COARSE-CSE	CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL	BROWN-BRN GRAY-GY VUGGY-VGY	FRACTURED-FRAC LAMINATION-LAM STYLOLITIC-STY	SLIGHTLY-SL/ VERY-V/ WITH-W/
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS		
				OIL	TOTAL WATER			

CORE NO. 10 7763'-7790' REC. 23'

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	OIL	TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
81	7777	0.6	11.2	9.8	71.4	SS FN-V CRSE, SHALY.
82	7780	7730.0	24.3	15.6	54.3	SS BRN-BUFF, MED-CRSE.
83	7781	1290.0	23.3	16.7	54.2	SS " "
84	7783	5870.0	24.6	16.3	55.3	SS " "
85	7784	2610.0	21.7	15.2	51.2	SS " "
86	7785	1110.0	24.5	14.7	53.1	SS " "
87	7786	1520.0	23.4	17.9	55.6	SS GY, MED GR.

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**CORE ANALYSIS RESULTS**

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 25 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts \_\_\_\_\_  
 (XXX) AUST. State VIC. Elev. 31'KB Location \_\_\_\_\_

**Lithological Abbreviations**

SHALE SH  
 SANDY SDY  
 FINE FN  
 CRYSTALLINE XLN  
 BROWN BRN  
 FRACTURED FRAC  
 SLIGHTLY SL/  
 CHERT CH  
 SHALY SHY  
 MEDIUM MED  
 GRAIN GRN  
 GRAY GY  
 LAMINATION LAM  
 GYPSUM GYP  
 ANHYDRITE ANHY  
 CONGLOMERATE CONG  
 FOSSILIFEROUS FOSS  
 LIMY LMY  
 COARSE CSE  
 GRANULAR GRNL  
 VUGGY VGY  
 STYLOLITIC STY  
 VERY V/  
 WITH W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

**CORE NO. 11 7790'-7820' REC. 4 1/2'**

89	7790	3650.0	23.4	12.8	43.6	SS, BUFF, CRSE-V CRSE, FRIABLE
89	7791	4410.0	21.1	16.7	57.8	" " " "
90	7792	5960.0	18.6	10.2	47.9	" " " "
91	7794	3060.0	23.6	15.3	49.6	" " " "

NOTE: ALL SAMPLES SHOWING GOOD ODOR AND FLUORESCENCE.

**CORE ANALYSIS RESULTS**

Company: ESSO STANDARD OIL Formation: \_\_\_\_\_ File: \_\_\_\_\_  
Well: HALIBUT A-1 Core Type: DIAMOND Date Report: 28 JULY 67  
Field: WILDCAT Drilling Fluid: FRESH WATER GEL Analysts: JKM  
(XXX) AUST. State: VIC Elev: 31 KB Location: \_\_\_\_\_

**Lithological Abbreviations**

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS				
				OIL	TOTAL WATER	SHALE SH LIM LIM	CLAYE DOG	ANHYDRITE ANHY LONGIMERATE CONG FOSS LIFEROUS FOSS	SANDY SDY SHALY SHY LIM LIM	FINE FN MEDIUM MED COARSE CSE

CORE NO. 13 7852'-7882' REC. 30'

92	7864	3.3	11.2	6.3	68.7	SS, GY, FN GRN, SHY, FAIR ODOR
93	7865	1543.0	17.5	10.9	58.4	" " FN-CSE, GOOD ODOR
94	7867	2.5	8.7	13.8	76.0	" DK GY, FN, SHY, POOR ODOR
95	7868	<0.1	14.4	5.5	70.8	" " " V/SHY "
96	7869	0.7	13.3	1.5	65.8	" " " " "
97	7870	*156.0	8.8	2.9	60.9	" " " " "
98	7871	35.0	25.6	16.8	57.4	" LT GY " CLEAN, GOOD ODOR
99	7872	420.0	26.2	17.2	60.3	" " " " "
100	7873	101.0	24.4	16.8	50.0	" " " " "
101	7874	16.0	23.8	16.8	42.8	" " " " "
102	7875	24.0	22.9	15.3	50.2	" " " SHY "
103	7878	1.0	16.8	3.6	73.2	" GY " " POOR ODOR
104	7880	.2	15.0	7.4	70.0	" " " " "

\*FRACTURES IN PERMEABILITY PLUG

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**CORE ANALYSIS RESULTS**

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 29 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts RLS  
 XXXX AUST. State VIC. Elev. 31'KB Location \_\_\_\_\_

**Lithological Abbreviations**

CHALK-CH  
 SHALE-SH  
 LIMESTONE-LM  
 DOLOMITE-DOL  
 CHERT-CH  
 GYPSUM-GYP  
 ANHYDRITE-ANHY  
 CONGLOMERATE-CONG  
 FOSSILIFEROUS-FOSS  
 SANDY-SDY  
 SHALY-SHY  
 LIMY-LMY  
 FINE-FN  
 MEDIUM-MED  
 COARSE-CSE  
 CRYSTALLINE-XLN  
 GRAIN-GRN  
 GRANULAR-GRNL  
 BROWN-BRN  
 GRAY-GY  
 VUGGY-VGY  
 FRACTURED-FRAC  
 LAMINATION-LAM  
 STYLOLITIC-STY  
 SLIGHTLY-SL/  
 VERY-V/  
 WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
						CORE NO. 14 7882'-7912' REC. 18'
105	7883	127.0	15.7	6.4	61.2	SS, GY, V/FN-V/CSE, GOOD ODOR
106	7886	1.3	15.2	7.2	78.3	" " V/FN, SHY, POOR ODOR
107	7890	.2	14.7	1.4	74.4	" " " " " "
108	7891	289.0	15.0	9.3	47.3	" " MED GRN, GOOD ODOR
109	7892	15.3	16.5	9.7	53.4	" " " CLAY MATX, "
110	7894	270.0	18.0	4.4	66.0	" " " GOOD ODOR

**CORE ANALYSIS RESULTS**

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 29 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts JKM  
 XXXX AUSTRALIA State VIC. Elev. \_\_\_\_\_ Location \_\_\_\_\_

**Lithological Abbreviations**

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCY	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

CORE NO. 15 7912'-7930' REC. 5'

111	7915	0.1	15.2	5.3	73.4	SS, GY, MED GRN, FAIR ODOF
112	7916	783.0	24.4	4.1	71.8	" " " "
113	7917	5670.0	22.4	4.5	86.2	" " " "

CORE ANALYSIS RESULTS

Company ESSO STANDARD OIL Formation \_\_\_\_\_ File \_\_\_\_\_  
 Well HALIBUT A-1 Core Type DIAMOND Date Report 30 JULY 67  
 Field WILDCAT Drilling Fluid FRESH WATER GEL Analysts RLS  
 XXXXX AUSTRALIA State VIC. Elev. \_\_\_\_\_ Location \_\_\_\_\_

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARREYS	POROSITY PERCENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	

CORE NO. 16 7930'-7960' REC. 24'

114	7936	90.0	18.7	3.2	81.3	SS, LT GY-WH, CLEAR, F-CSE, PR
115	7937	1130.0	20.5	1.0	91.3	" " " " "
116	7938	18.0	15.0	5.3	79.4	" " " " "
117	7939	49.0	11.2	1.8	84.8	" " " " "
118	7940	44.0	15.6	1.3	87.2	" " " " "
119	7941	2800.0	22.5	0.0	89.8	" " " " "
120	7942	6720.0	18.4	0.0	91.9	" " " " "
121	7943	12400.0	26.8	0.0	68.3	" " " " "
122	7944	9420.0	19.0	0.0	76.4	" " " " "
123	7945	10480.0	25.3	0.0	70.0	" " " " "
124	7946	*	26.0	0.0	88.8	" " " " "
125	7947	6610.0	25.7	0.0	90.0	" " " " "
126	7948	17500.0	22.4	0.0	84.6	" " " " "
127	7949	20600.0	22.7	0.0	93.4	" " " " "
128	7950	3630.0	24.9	0.0	91.6	" " " " "
129	7951	22700.0	25.4	0.0	86.2	" " " " "
130	7952	334.0	26.9	0.0	89.2	" " " " "
131	7953	5033.0	26.9	0.0	87.9	" " " " "
132	7954	5140.0	25.1	0.0	89.3	" " " " "

\* TOOPRIABLE FOR PERMEABILITY MEASUREMENT.

NOTE: VERY SOFT SAND IS EASILY MOULDED BY HAND. UNUSUALLY HIGH PERMEABILITY VALUES PROBABLY DO NOT EXIST IN RESERVOIR.



4. Palynological Report.

Well. File - Halibut.

PALYNOLOGICAL REPORT ON HALIBUT A-1 WELL, 8400 - 9000 FEET

Further to the palynological study (Dettmann 1967) carried out on core and cutting samples from between 7550 feet and 8300 feet in Esso Halibut A-1 well, cuttings from 8400 - 9000 feet have been examined palynologically and the results are assessed in this report. The material examined from between 8400 feet and 9000 feet yielded generally poorly preserved plant microfossils including infrequent spores, pollen grains, and microplankton and abundant wood and cuticular debris.

1) 8400 feet - 8800 feet

Spores, pollen grains, and microplankton extracted from the material examined contain pyritic material adherent to and/or embedded in the wall layers. The plant microfossils are accompanied by foraminiferal remains consisting of inner chitinous tests arranged in planispiral whorls of up to 15 chambers. Spore-pollen species identified include Triorites edwardsii, Dacrydiunites balmei, and Stechanorocollenites obscurus. The presence of these forms and the absence of species restricted to the Cretaceous suggests that the horizons are referable to the Triorites edwardsii or Transition Zones.

Microplankton extracted from the samples are numerically insubordinate to spores and pollen grains except in a sample from 8400 feet where hystrichosphaerid types are common. Microplankton species identified include Gimnodinium tabulatum, Cyclonecheliun retinatum, and diverse forms possibly referable to Baltisphaeridium.

2) 8700 feet - 9000 feet

The impoverished microfloras extracted from the samples are poorly preserved and consist chiefly of spores and pollen grains. Microplankton

**INTERPRETATIVE**

were recovered in minor proportions from several samples and include Cyclonephelium retintertextum and Baltisphaeridium spp. Spore-pollen species identified include Dacrydiomites balnei, Stephanopollenites obscurus, and Nothofagidites emarcidus. Forms diagnostic of the Tricolpites lillei Zone or older Cretaceous zones were not recognized and the presence of Dacrydiomites balnei may suggest that the sediments are within the Triorites edwardsii or Transition Zones.

#### CONCLUSIONS

Sediments between 3400 feet and 9000 feet in Halibut A-1 well are considered on the basis of their contained microfloras to be possibly within the Triorites edwardsii or Transition Zones. The Triorites edwardsii Zone probably extends as high as 7650 feet (Dettmann 1967) and is succeeded by the Durolonellis orthoteichus Zone (7559 - 7629 feet).

Palynological contents of the D. orthoteichus Zone include dominant spores and pollen grains and rare microplankton. In the T. edwardsii and/or Transition Zones spores and pollen grains are dominant in the majority of samples, but microplankton show a qualitative increase in samples between 8400 feet and 8600 feet where they are associated with foraminiferal remains. Similar associations of abundant microplankton, infrequent spores and pollen grains, and foraminiferal remains have been recorded from the T. edwardsii Zone in Kingfish A-1 well (Dettmann 1963).

#### REFERENCES

- Dettmann, M.E. 1967. Palynological report on Esso Halibut A-1 well, 7559 - 8600 feet. Unpubl. report submitted to Esso Standard Oil (Australia) Ltd. 2/15/67.  
Dettmann, M.E. 1968. Palynological report on Esso Kingfish A-1, B-1, and C-1 wells. Unpubl. report submitted to Esso Standard Oil (Australia) Ltd. 30/6/68.

6th December, 1968

Mary E. Dettmann,  
Department of Geology,  
University of Queensland, Qld.

INTERPRETATIVE

PE904840

This is an enclosure indicator page.  
The enclosure PE904840 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904840 has the following characteristics:

- ITEM\_BARCODE = PE904840
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Species List
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = DIAGRAM
- DESCRIPTION = Halibut 1 Species List
- REMARKS = Page 1 of 4
- DATE\_CREATED =
- DATE\_RECEIVED =
- W\_NO = W507
- WELL\_NAME = Halibut-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904841

This is an enclosure indicator page.  
The enclosure PE904841 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904841 has the following characteristics:

ITEM\_BARCODE = PE904841  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Species List  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = DIAGRAM  
DESCRIPTION = Halibut 1 Species List  
REMARKS = Page 2 of 4  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904842

This is an enclosure indicator page.  
The enclosure PE904842 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904842 has the following characteristics:

ITEM\_BARCODE = PE904842  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Species List  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = DIAGRAM  
DESCRIPTION = Halibut 1 Species List  
REMARKS = Page 3 of 4  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904843

This is an enclosure indicator page.  
The enclosure PE904843 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904843 has the following characteristics:

ITEM\_BARCODE = PE904843  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Species List  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = DIAGRAM  
DESCRIPTION = Halibut 1 Species List  
REMARKS = Page 4 of 4  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

BASIN GIPPSLAND BASIN

BY David TAYLOR

WELL NAME HALIBUT -1

DATE 19 April 1971 ELEV. +31'

Foram Zones

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A Alternate				1130	3	
	B Alternate	1160	3		1640	3	
	C Alternate	1700	3		2800	3	
	D <sub>1</sub> Alternate	2990	3		5700	3	
	D <sub>2</sub> Alternate	5715	1		6600	3	
	E Alternate	6700	3		7150	3	
	F Alternate						
	G Alternate						
	H <sub>1</sub> Alternate	7200	3				
	H <sub>2</sub> Alternate	7255	1		7255	1	
	OOLIGOCENE	I <sub>1</sub> Alternate	7300	3		7400	3
I <sub>2</sub> Alternate							
J <sub>1</sub> Alternate		7485	4		7490	4	
J <sub>2</sub> Alternate							
EOC.	K Alternate						
	Pre K						

COMMENTS:

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 zone, 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 zone 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 \_\_\_\_\_



BASIN GIPPSLAND

DATE \_\_\_\_\_

WELL NAME HALIBUT -1

ELEVATION + 31 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
Eocene	<u>P. tuberculatus</u>										
	<u>U. N. asperus</u>										
	<u>M. N. asperus</u>										
	<u>L. N. asperus</u>										
	<u>P. asperopolus</u>										
	<u>U. M. diversus</u>										
	<u>M. M. diversus</u>										
	<u>L. M. diversus</u>	7550	1				7632	1			
Paleocene	<u>U. L. balmei</u>	7650	1			7931	1				
	<u>L. L. balmei</u>	9360	1			9560	1				
	<u>T. longus</u>	9721	2			9860	2				
Cretaceous	<u>T. lilliei</u>										
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>T. pannosus</u>										
EARLY CRETACEOUS											
PRE-CRETACEOUS											
		T.D.	10,010								

COMMENTS:

Wetzeliella homomorpha Dinoflagellate Zone 7650(1) - 7915(1)  
The Eisenackia crassitabulata Dino. Zone may be present in the  
unsampled interval between 7931' to 9360'. The basal part of  
the L.L. balmei Zone and the top of the T. longus Zone contain  
dinoflagellates but lack the zone species of the T. evittii / D. druggii Zone

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: LES.

DATE Dec. 1971.

DATA REVISED BY: ADP.

DATE Jan. 1975.

BASIN CUPPSLAND DATE \_\_\_\_\_  
 WELL NAME HALIBUT -1 ELEVATION + 31 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
MIOC.	<u>T. bellus</u>										
	<u>P. tuberculatus</u>										
Eocene	<u>U. N. asperus</u>										
	<u>L. N. asperus</u>										
	<u>P. asperopolus</u>										
	<u>U. M. diversus</u>										
	<u>L. M. diversus</u>	7550	1				7632	1			
PALEOCENE	<u>L. balmei</u>	7650	1				9560	1			
	<u>T. longus</u>	9721	1				9860	2			
LATE CRETACEOUS	<u>T. lilliei</u>										
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>F. pannosus</u>										
EARLY CRETACEOUS	<u>C. paradoxa</u>										
	<u>C. striatus</u>										
	<u>U. C. hughesii</u>										
	<u>L. C. hughesii</u>										
	<u>C. stylosus</u>										
Pre-Cretaceous											

COMMENTS: T.D. 10010 (2006)

- 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 spores 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.

DATE RECORDED BY: L.E.S./ A.D.P. DATE June 1971  
 DATA REVISED BY: L.E.S. DATE Dec. 1971

5. Hydrocarbon Report.  
\* F.I.T. data.

PETROLEUM DIVISION

FILE COPY

**OXON** PRODUCTION RESEARCH COMPANY  
POST OFFICE BOX 2189 · HOUSTON, TEXAS 77001

RESERVOIR DIVISION

C. C. MATTAX  
MANAGER

July 10, 1978

Mr. J. F. Kirk  
Esso Australia Ltd.  
G. P. O. Box 4047  
Sydney, N.S.W., 2001  
Australia

Attention: Mr. C. A. Langner

Dear Sir:

EPR.75PS.78 - Hydrocarbon Report  
Analysis of Metered Liquid Stream Samples  
Halibut, Kingfish A and Kingfish B Platforms  
Longford Plant Stabilizer  
Esso Australia Ltd.

---

This report presents results of PVT and compositional analyses made on the above mentioned samples. Also included are the results of flash liberation experiments made on the three platform samples which contained gas in solution. This work was undertaken to obtain data relating volumes at metered conditions to volumes at standard conditions and was initiated by Mr. D. A. Collins' telex of January 24, 1978.

Very truly yours,

C. C. MATTAX

By Robert H. Rossen  
R. H. Rossen

GTP:clw

cc: E. C. Wells, Jr.

EXXON PRODUCTION RESEARCH COMPANY

HYDROCARBON REPORT - METERED LIQUID STREAM SAMPLES  
HALIBUT, KINGFISH A AND KINGFISH B PLATFORMS  
LONGFORD PLANT STABILIZER

***PRODUCTION LIBRARY***

G. T. Pyndus  
W. T. Muzacz  
R. W. Myers

Reservoir Division

June 1978

EPR.75PS.78

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HALIBUT PLATFORM METERED LIQUID

TABLE I

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Halibut Platform Metered Crude

Date Taken: March 16, 1978

Sampling Conditions: 600 psig and 198°F

<u>Pressure, psig</u>	<u>Relative Volume @ 198°F</u>	<u>Density, gm/cc @ 198°F</u>
1000	0.9919	0.7557
903	0.9931	0.7548
807	0.9944	0.7538
713	0.9956	0.7529
600	0.9968	0.7520
508	0.9981	0.7510
317	0.9987	0.7506
$P_b = 230$	1.0000	0.7496

$$\frac{\text{Volume @ 14.73 psia \& 60°F}}{\text{Volume @ 14.73 psia \& 198°F}} = 0.7510^*$$

$$\text{gm/cc @ 14.73 psia \& 60°F} = 0.8064^*$$

$$\frac{\text{Volume @ 14.73 psia \& 60°F}}{\text{Volume @ 600 psig \& 198°F}} = 0.9102^*$$

\*Based on residual liquid from an atmospheric flash liberation @ 77°F having a density of 43.6° API @ 60°F.

Specific volume at saturation pressure = 0.02147 cu ft/lb



TABLE II

Hydrocarbon Analysis of Metered Liquid Sample

Source: Esso Australia Ltd., Halibut Metered Liquid

Date Taken: March 16, 1978

<u>Component</u>	<u>Weight Percent</u>	<u>Density, g/cc at 60° F</u>	<u>Molecular Weight</u>	<u>Mol %</u>
Hydrogen Sulfide	Nil			Nil
Carbon Dioxide	0.23			0.76
Nitrogen	0.03			0.16
Methane	0.34			3.09
Ethane	0.32			1.55
Propane	1.19			3.94
Iso-Butane	1.16			2.91
N-Butane	1.79			4.49
Iso-Pentane	1.68			3.39
N-Pentane	1.87			3.78
Hexanes	2.97	0.6911	85	5.09
Heptanes	5.94	0.7026	99	8.75
Octanes	6.29	0.7323	113	8.12
Nonanes	5.57	0.7665	129	6.30
Heavier Fraction	<u>70.62</u>	0.8514	216	<u>47.67</u>
Total	100.00			100.00

Pentane-Free Fraction

Properties of Hexane Plus:

Density, gm/cc @ 60°F = 8421

Mol Weight = .205

TABLE III

Comparison of Experimental and Computed Flash Liberation Results

Source: Esso Australia Ltd., Halibut Metered Liquid

Date Taken: March 16, 1978

(P <sub>1</sub> ) Pressure psig	Temperature °F	Gas-Oil Ratio - cu ft/bbl Residual Oil				Residual Oil Gravity °API at 60°F		V <sub>r</sub> /V <sub>bp</sub> or 1/B <sub>oi</sub>	
		Flashed at P <sub>1</sub>		Flashed from P <sub>1</sub> to 0		Experimental	Computed	Experimental	Computed
		Experimental	Computed	Experimental	Computed	Experimental	Computed	Experimental	Computed
0	77	70	-	-	-	43.6		0.9011	

Data Used in Flash Calculations

Component	Mol %	gal/RO1	K-value Source: NGAA (1957) Convergence Pressure: 10000 psia	
Hydrogen Sulfide	Nil		Unadjusted Flash Data	
Carbon Dioxide	0.76	5.17		
Nitrogen	0.16	6.38	Molecular weight of heavier fraction <u>216</u> Density of heavier fraction, gm/cc at 60°F <u>0.8514</u> Specific volume of flowline fluid at 230 psig bubble point and 198 °F, cu ft/lb <u>0.02147</u> Mols per barrel <u>1.801</u>	
Methane	3.09			
Ethane	1.55			
Propane	3.94			
Iso-Butane	2.91			
N-Butane	4.49			
Iso-Pentane	3.39			
N-Pentane	3.78			
Hexanes	5.09	14.74		
Heptanes	8.75	16.88		
Octanes	8.12	18.49		
Nonanes	6.30	20.17		
Heavier Fraction	<u>47.67</u>	<u>30.40</u>		
TOTAL	100.00	100.00		

KINGFISH A PLATFORM METERED LIQUID

TABLE IV

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hours

Sampling Conditions: 690 psig and 90°C (194°F)

<u>Pressure, psig</u>	<u>Relative Volume, @ 194°F</u>	<u>Density gm/cc @ 194°F</u>
1000	0.9948	0.6893
896	0.9963	0.6882
775	0.9980	0.6871
690	0.9991	0.6863
P <sub>b</sub> = 624	1.0000	0.6857
<u>Volume @ 14.73 psia &amp; 60°F</u> <u>Volume @ 14.73 psia &amp; 194°F</u>	0.9297*	
gm/cc @ 14.73 psia & 60°F		0.7897*
<u>Volume @ 14.73 psia &amp; 60°F</u> <u>Volume @ 690 psig &amp; 194°F</u>	0.7976*	

\*Based on residual liquid from an atmospheric flash liberation at 70°F having a density of 47.5° AP/@ 60 F

Specific volume at saturation pressure = 0.02336 cu ft/lb

TABLE V

Hydrocarbon Analysis of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hours

<u>Component</u>	<u>Weight%</u>	<u>Density (gm/cc@60°F)</u>	<u>Mol. Weight</u>	<u>Mol%</u>
Carbon dioxide	0.12			0.32
Nitrogen	0.04			0.17
Methane	1.52			11.04
Ethane	1.19			4.61
Propane	2.77			7.32
iso-Butane	2.04			4.09
n-Butane	3.15			6.31
iso-Pentane	2.16			3.49
n-Pentane	2.51			4.05
Hexane	4.58	0.6952	87	6.13
Heptanes	7.36	0.7105	97	8.84
Octane	7.34	0.7423	112	7.63
Nonane	6.81	0.7574	121	6.56
Decane Plus	<u>58.41</u>	0.8364	231	<u>29.44</u>
	100.00			100.00

Properties of Hexane Plus:

Density = gm/cc @ 60°F = 0.8221

Mol. Wt. = 168

TABLE VI

Comparison of Experimental and Computed Flash Liberation Results

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hrs

Bubble Point Pressure: 624 psig at 90°C(194°F)

Sampling Pressure: 690 psig and 90°C

(P <sub>1</sub> ) Pressure psig	Temperature °F	Gas-Oil Ratio - cu ft/bbl Residual Oil				Residual Oil Gravity °API at 60°F		V <sub>r</sub> /V <sub>bp</sub> or 1/B <sub>oi</sub>	
		Flashed at P <sub>1</sub>		Flashed from P <sub>1</sub> to 0		Experimental	Computed	Experimental	Computed
		Experimental	Computed	Experimental	Computed				
0	70	265		-		47.5		0.7969	
0	*		269		-		47.4		0.7958

Data Used in Flash Calculations

∞

Metered Liquid		
Component	Mol %	gal/mol
Hydrogen Sulfide	Nil	
Carbon Dioxide	0.32	6.38
Nitrogen	0.17	4.16
Methane	11.04	
Ethane	4.61	
Propane	7.32	
Iso-Butane	4.09	
N-Butane	6.31	
Iso-Pentane	3.49	
N-Pentane	4.05	
Hexanes	6.13	15.00
Heptanes	8.84	16.36
Octanes	7.63	18.08
Nonanes	6.56	19.14
Heavier Fraction	29.44	33.09
TOTAL	100.00	

K-value Source: NGAA (1957)

Convergence Pressure: 10,000 psiaUnadjusted Flash Data

Molecular weight of heavier fraction

231

Density of heavier fraction, gm/cc at 60°F

0.8363Specific volume of metered fluid at 624  
psig bubble point and 194 °F,  
cu ft/lb0.02336

Mols per barrel

2.063\*65°F K values and a +3% adjustment to the  
decane plus density

KINGFISH B PLATFORM METERED LIQUID

TABLE VII

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish B Platform Metered Liquid

Date Taken: July 21, 1977, 1500 hours

Sampling Conditions: 840 psig and 84°C (183.2°F)

<u>Pressure, psig</u>	<u>Relative Volume, @ 183.2°F</u>	<u>Density gm/cc @ 183.2°F</u>
1000	0.9968	0.7044
930	0.9979	0.7036
840	0.9992	0.7027
P <sub>b</sub> = 785	1.0000	0.7021

<u>Volume @ 14.73psia &amp; 60°F</u>	0.9358*
<u>Volume @ 14.73 psia &amp; 183.2°F</u>	

gm/cc @ 14.73 psia & 60°F	0.7910*
---------------------------	---------

<u>Volume @ 14.73psia &amp; 60°F</u>	0.7966*
<u>Volume @ 840 psig &amp; 183.2°F</u>	

\*Based on residual liquid from an atmospheric flash liberation at 70°F having a density of 47.2° AP/@ 60F

Specific volume at saturation pressure = 0.02281 cu ft/lb



TABLE VIII

Hydrocarbon Analysis of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish B Platform Metered Liquid

Date Taken: July 21, 1977, 1500 hours

<u>Component</u>	<u>Weight%</u>	<u>Density</u> <u>(gm/cc@60°F)</u>	<u>Mol.</u> <u>Weight</u>	<u>Mol%</u>
Carbon dioxide	0.14			0.36
Nitrogen	0.04			0.16
Methane	2.09			14.93
Ethane	1.31			4.99
Propane	2.82			7.33
iso-Butane	2.00			3.94
n-Butane	3.07			6.05
iso-Pentane	2.13			3.38
n-Pentane	2.48			3.94
Hexane	3.65	87	0.6952	4.81
Heptanes	5.74	98	0.7123	6.71
Octane	7.31	111	0.7427	7.55
Nonane	6.10	119	0.7615	5.88
Decane plus	<u>61.12</u>	234	0.8389	<u>29.97</u>
	100.00			100.00

Properties of Hexanes Plus:

Density = gm/cc @ 60°F = 0.8212

Mol. Wt. = 168

TABLE IX

Comparison of Experimental and Computed Flash Liberation Results

Source: Esso Australia Ltd., Kingfish B Platform Metered Liquid

Date Taken: July 21, 1977, 1500 hrs.

Bubble Point Pressure: 785 psig at 84°C (183.2°)  
Sampling Pressure: 840 psig at 84°C

(P <sub>1</sub> ) Pressure psig	Temperature °F	Gas-Oil Ratio - cu ft/bbl Residual Oil		Residual Oil Gravity °API at 60°F		V <sub>r</sub> /V <sub>bp</sub> or 1/B <sub>oi</sub>	
		Flashed at P <sub>1</sub> Experimental	Flashed from P <sub>1</sub> to 0 Computed	Experimental	Computed	Experimental	Computed
0	70	349	-	47.2	-	0.7960	-
0	*	-	350	-	-	47.2	0.7953

12

Data Used in Flash Calculations

Metered Liquid		
Component	Mol %	gal/mol
Hydrogen Sulfide	Nil	
Carbon Dioxide	0.36	6.38
Nitrogen	0.16	4.16
Methane	14.93	
Ethane	4.99	
Propane	7.33	
Iso-Butane	3.94	
N-Butane	6.05	
Iso-Pentane	3.38	
N-Pentane	3.94	
Hexanes	4.81	15.00
Heptanes	6.71	16.49
Octanes	7.55	17.91
Nonanes	5.88	18.73
Heavier Fraction	29.97	33.42
TOTAL	100.00	

K-value Source: NGAA (1957)

Convergence Pressure: 10,000 psiaUnadjusted Flash Data

Molecular weight of heavier fraction

234

Density of heavier fraction, gm/cc at 60°F

0.8389Specific volume of metered fluid at 785  
psig bubble point and 183.2°F,  
cu ft/lb0.02281

Mols per barrel

2.147\*75°F K values and a plus 3/4% adjustment to the decane  
plus density were used in the flash calculations.

LONGFORD PLANT STABILIZER LIQUID

TABLE X  
Pressure-Volume Relations of  
 Stabilizer Liquid Sample

Source: Esso Australia Ltd., Longford Plant Stabilizer Liquid

Date Taken: October 14, 1977 @ 1500 hours

Sampling Conditions: 856 psig & 63°C (145.4°F)

<u>Pressure, psig</u>	<u>Relative Volume, @ 145.4°F</u>	<u>Density gm/cc @ 145.4°F</u>
1000	0.9927	0.7692
920	0.9935	0.7686
856	0.9941	0.7681
640	0.9958	0.7668
420	0.9974	0.7656
212	0.9988	0.7645
0	1.0000	0.7636

$\frac{\text{Volume @ 14.73 psia \& 60°F}}{\text{Volume 14.73 psia \& 145.4°F}}$  0.9567\*

gm/cc @ 14.73 psia & 60°F 0.7982\*

$\frac{\text{Volume @ 14.73 psia \& 60°F}}{\text{Volume @ 856 psig \& 145.4°F}}$  0.9623\*

\*Oil density = 45.6° AP/@ 60°F

Specific volume @ 856 psig & 145.4°F = 0.02085 cu ft/lb

TABLE XI

## Hydrocarbon Analysis of Stabilizer Liquid Sample

Source: Esso Australia Ltd., Longford Plant Stabilizer Liquid

Date Taken: October 14, 1977 @ 1500 hrs.

Sampling Conditions: 856 psig and 63°C (145.4°F)

<u>Component</u>	<u>Weight %</u>	<u>Density</u> <u>(gm/cc @ 60°F)</u>	<u>Mol</u> <u>Weight</u>	<u>Mol %</u>
Carbon dioxide	0.13			0.48
Nitrogen	0.09			0.52
Methane	0.01			0.10
Ethane	0.01			0.05
Propane	0.28			1.03
iso-Butane	0.44			1.23
n-Butane	1.05			2.93
iso-Pentane	2.35			5.29
n-Pentane	2.24			5.04
Hexane	4.37	0.7064	90	7.88
Heptanes	5.09	0.7229	104	7.94
Octane	7.10	0.7388	116	9.93
Nonane	7.60	0.7578	124	9.95
Decane Plus	<u>69.24</u>	0.8124	236	<u>47.63</u>
Total	100.00			100.00

Properties of Hexane Plus:

Density = gm/cc @ 60°F. = 0.7949

Mol. Wt. = 161

PE904844

This is an enclosure indicator page.  
The enclosure PE904844 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904844 has the following characteristics:

- ITEM\_BARCODE = PE904844
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 F.I.T. Data
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = FIT
- DESCRIPTION = Halibut 1 Formation Interval Test  
(F.I.T.) Data
- REMARKS =
- DATE\_CREATED =
- DATE\_RECEIVED =
- W\_NO = W507
- WELL\_NAME = Halibut-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

6. Vitrinite Reflectance Measurements  
\* Rock - Eval Data Sheet.

Oil & Gas

Just Dawni

RECD  
22.4.86  
KRO



**Amoco Australia Petroleum Company**  
(Inc. in Delaware, U.S.A., with Limited Liability - Registered as a Foreign Company in Tasmania)

15 Blue Street, North Sydney  
P.O. Box 126, North Sydney 2060  
Phone (02) 957 4500  
Telex AA23359  
Facsimile (02) 922 4886

April 16, 1986

The Director of Mines,  
Department of Minerals and Energy,  
East Tower, Princes Gate,  
151 Flinders Street,  
Melbourne. Vic. 3000

22 APR 1986

**OIL and GAS DIVISION**

Dear Sir,

Re: Gippsland Basin Vitrinite Reflectance Measurements  
MISC-AUP-141-L-310-SCB

In 1985 Amoco Australia Petroleum Company collected core and cutting samples from thirteen Gippsland Basin wells for vitrinite reflectance determinations. The following attachments are a summary of the work.

Yours faithfully,

HALIBUT-1

S.C. Bane  
Exploration Manager

SCB/lrc

Attach.



Depth (ft)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
<u>ALBACORE -1</u> 9380&9390	0.42	0.04	0.31-0.48	42
9720&2730	0.46	0.06	0.36-0.59	36
10070	0.46	0.04	0.36-0.55	39
10320	0.47	0.04	0.38-0.54	34
<u>BARRACOUTA-3</u>				
7310-7320	0.54	0.05	0.46-0.63	35
8590	0.60	0.08	0.43-0.71	35
9100-9120	0.62	0.10	0.41-0.80	41
9330-9360	0.64	0.10	0.43-0.93	36
9540-9560	0.73	0.05	0.63-0.84	33
<u>BATFISH-1</u>				
7560-7570	0.61	0.05	0.53-0.69	34
8170-8180	0.64	0.05	0.56-0.75	34
8640-8650	0.69	0.05	0.55-0.81	31
9170-9190	0.76	0.04	0.66-0.81	28
9430-9450	0.76	0.05	0.69-0.90	41
<u>BONITA-1A</u>				
9780-9790	0.54	0.06	0.46-0.68	36
10050	0.56	0.05	0.47-0.64	36
10280-10290	0.55	0.04	0.47-0.64	47
<u>BREAM-2</u>				
8070-8090	0.63	0.05	0.52-0.70	39
8380-8390	0.67	0.06	0.53-0.80	41
8933-8944	0.73	0.05	0.62-0.85	43
9730-9750	0.83	0.07	0.71-0.98	38
10638-10641	0.88	0.11	0.62-1.13	42

Depth (ft)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
<u>COD-1</u>				
7100-7120	0.63	0.06	0.53-0.81	41
8333-8339	0.59	0.05	0.47-0.67	34
9030-9060	0.75	0.06	0.61-0.85	32
9460-9470	0.77	0.06	0.61-0.86	41
<u>FLOUNDER-1</u>				
7430	0.44	0.05	0.36-0.56	39
8783-8795	0.64	0.04	0.56-0.77	36
9140	0.61	0.06	0.52-0.77	42
10395-10400	0.72	0.06	0.58-0.80	34
11350-11356	0.90	0.05	0.76-0.97	36
11676-11682	0.90	0.07	0.78-1.04	44
<u>HALIBUT-1</u>				
7888-7891	0.49	0.07	0.37-0.67	39
8450-8460	0.54	0.04	0.47-0.61	31
9250-9260	0.57	0.06	0.46-0.66	43
9630-9640	0.61	0.04	0.54-0.69	35
9870-9880	0.63	0.06	0.47-0.75	52
<u>MACKEREL-1</u>				
8760-8780	0.63	0.05	0.52-0.71	31
9630-9650	0.66	0.05	0.69-0.76	25
9870-9890	0.65	0.02	0.60-0.73	28

Depth (ft)	Mean Maximum Reflectance (%)	Standard Deviation	Range	Number of Determinations
<u>MARLIN-1</u>				
7070-7080	0.65	0.08	0.52-0.80	32
7497-7501	0.65	0.04	0.54-0.72	38
7780-7800	0.67	0.09	0.47-0.88	39
8230-8240	0.71	0.07	0.64-0.79	4
8455-8461	0.70	0.06	0.56-0.79	32
<u>NANNYGAI-1</u>				
7760-7670	0.052	0.07	0.39-0.65	33
8320-8340	0.50	0.05	0.42-0.65	32
9450-9470	0.64	0.04	0.57-0.71	35
9860-9880	0.64	0.06	0.51-0.75	31
<u>SALMON-1</u>				
7670-7690	0.50	0.06	0.38-0.64	35
8030-8050	0.56	0.05	0.45-0.67	37
8860	0.60	0.05	0.45-0.67	33
9250-9260	0.64	0.06	0.54-0.79	36
9856-9862	0.80	0.05	0.68-0.87	37
<u>SNAPPER-1</u>				
7280-7300	0.56	0.06	0.43-0.69	37
7754-7760	0.56	0.09	0.38-0.73	38
9254-9257	0.68	0.03	0.60-0.72	33
9900-9903	0.86	0.10	0.62-0.96	17
10140-10200	0.81	0.10	0.58-1.01	31
10495-10507	0.99	0.06	0.81-1.06	35

**Oil and GAS DIVISION**

**ROCK-EVAL DATA SHEET**

BY MOBIL OIL AUST.

05 JUL 1984

Sample No. or Depth	% TOC	S <sub>1</sub> (ma/a)	S <sub>2</sub> (ma/a)	S <sub>3</sub> (ma/a)	T max (°C)	Hydrogen Index	Oxygen Index	S <sub>2</sub> /S <sub>3</sub>
<i>Halibut-1 Well</i>								
8320-8370c	6.727	13.26	194.86	5.61	419	289.6	8.3	34.72
" S	3.08	0.24	1.67	9.11	432	54.2	295.7	0.18
8680-8720c	5.927	11.14	183.91	5.52	421	311.6	9.4	33.29
" S	2.84	0.23	2.35	4.19	435	82.9	147.4	0.56
9150-9160c	9.050	7.85	161.89	5.21	419	229.6	67.4	24.48
" S	10.95	1.36	24.05	2.04	427	219.6	18.7	11.77
9510-9520c	7.035	6.24	141.19	5.77	424	260.7	8.2	3.42
" S	8.56	0.48	14.41	1.93	432	168.3	22.5	7.48
9630-9670c	7.87	11.40	176.62	6.88	422	242.4	9.4	25.68
" S	7.05	0.60	10.07	2.09	434	142.8	29.6	4.82
9750-9790c	6.455	8.37	157.76	6.26	426	244.4	9.7	25.21
" S	7.40	0.79	10.26	1.97	431	138.6	26.6	5.22
<i>Tuna-1 Well</i>								
5200-5230c	62.84	4.22	85.92	14.77	428	136.7	235	5.82
" S								
5660-5710c	64.81	4.71	76.75	9.12	424	118.4	14.1	8.42
" S								
5800-5830c	60.09	3.67	45.10	16.78	425	75.1	27.9	2.69
" S								
6020-6040c	48.53	6.00	91.43	8.54	425	188.4	17.6	10.71
" S								
6200-6270c	62.65	3.07	65.42	19.14	424	104.4	30.6	7.22
" S								
6370-6390c	64.49	5.04	98.32	13.62	423	152.5	21.1	10.44
" S								
9150-9170c	64.22	2.70	94.44	9.86	424	147.1	15.4	9.58
" S								
9410-9430c	65.33	3.78	92.41	13.25	431	141.5	20.3	6.97
" S								

C = COAL  
S = SHALE

7. Velocity Survey  
\* Time-Depth Curve.

VELOCITY SURVEY

ESSO HALIBUT A-1

By

R.J. Steele

RE-NAMED  
(AUG. 1968)  
HALIBUT 1

A. INTRODUCTION

Esso Australia contracted the United Geophysical Corporation to carry out the velocity survey. United furnished the following:

1) Instruments -

- a. SSC Model GCE 101 Pressure Sensitive Well Geophone.
- b. Model 1-27 United Refraction Amplifier with nickel-cadmium power supply.
- c. Electro-tech ER-62 standard 25 trace camera.
- d. Two F-M Transceivers.
  - (1) PYE "Premier" Type MFV-516
  - (2) AWA "Carphone"
- e. One 70 Volt Blaster.
- f. Additional sundry equipment.

2) Personnel -

One Marine Shooter, M. Clark, one Instrument Operator, W.J. Larson and one Geophysical Supervisor, B.H. Flusche.

3) Shooting Boat -

One licensed shooting boat - "Pasadena Star".

All equipment and personnel were assembled on Glomar III by August 4, 1967 and the survey was made on August 5, 1967.

B. SURVEY PROCEDURES

Weather was exceptionally good during the survey and no operational difficulties were encountered.

1) Shot Positioning -

The orientation of Glomar III was SW - NE during the survey and a buoy was positioned at 1000 feet on either side of the ship along a line passing NW - SE through the well site. Exact shot offsets were obtained from water arrivals at the well, measured by two geophones lowered into the moonpool.

2) Shot Size -

All shots were 33.3 lbs.

3) Well Geophone Positioning -

All depth measurements were made using the Schlumberger depth indicator. To minimize rig noise the marine riser was disconnected from the derrick floor and lowered to the casing top. The cable was clamped with a T-bar device which rested on the casing top at each geophone position to de-couple from rig movement.

4) Time -

The first charge was shot at 8:35 am and the last at 12 noon. The velocity survey took just over 4 hours of rig time.

5) Instrumentation -

The seismic recording instruments were assembled in the core lab. This afforded reasonably good communication with Schlumberger and the derrick floor.

The survey records consist of 6 traces. Traces 1-3 recorded the well geophone break at 3 different recording levels. Traces 4 and 5 recorded the water arrivals at the 2 geophones in the moonpool. The time break was recorded on trace 6.

6) Instrumental Checks -

Subsequent to the velocity survey, several instrumental checks were carried out :

- a. Time Break - Cable break check.
- b. Timing line check.
- c. Pulse test - to reveal any relative delays between the 6 traces.

These test trips are included in the folder of this report.

C. RESULTS

A total of twelve shots were made at six different levels. The first six shots were set off near the NW 1000 foot buoy as the well-phone was lowered into the hole. The six repeat shots were set off near the SE 1000 foot buoy as the well-phone was withdrawn.

The quality of the records is considered good. The time and water breaks are excellent in all cases. The well-phone breaks are generally good but not as sharp as the corresponding time and water breaks. There was an apparent ambiguity in the well-phone break in both records shot at 7011 feet (KB). However a comparison of interval velocities with the integrated sonic log resolved this problem.

All the records are included in the folder of this report.

The final check-shot times and the integrated sonic times are compared in the error chart (fig.1) which shows them to be in good agreement.

D. CONCLUSION

The velocity survey was successful in tying the integrated Sonic Log to absolute time values.

ESSO HALIBUT A-1

VELOCITY SURVEY ERROR CHECK

Figure 1

<u>Depth</u> <u>Rel.S.L.</u>	<u>Av. Vertical</u> <u>Travel Time</u> <u>(Check Shots)</u>	<u>Ti Check</u> <u>Shots</u> <u>(Sec.)</u>	<u>Ti Sonic</u> <u>Log</u> <u>(Sec.)</u>	<u>(Millisecs.)</u>	<u>Depth</u> <u>Interval</u> <u>(Ft.)</u>	<u>Error</u> <u>(Microsec</u> <u>per Ft.)</u>
3004	.385					
		.099	.097	+ 2	992	+ 2
3996	.484					
3996	.484					
		.147	.143	+ 4	1769	+ 2
5765	.631					
5765	.631					
		.121	.116	+ 5	1215	+ 4
6980	.752					
6980	.752					
		.049	.048	+ 1	481	+ 2
7461	.801					
7461	.801					
		.078	.081	- 3	959	- 3
8420	.879					

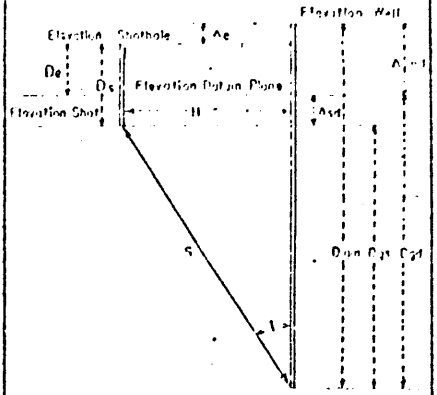
ALTERNATIVE INTERPRETATION OF 7011' (KB) SHOT:

5765	.631					
		.114	.116	- 2	1215	- 2
6980	.745					
6980	.745					
		.056	.048	+ 8	481	+17 *

\* SONIC LOG DISCREDITS ALTERNATIVE INTERPRETATION.



Shot Information - Elevation, Distance & Direction from Well										Company		Well		Elevation (Corr'd Floor)	Total Depth	LOCATION										
										ESSO EXPLORATION AUSTRALIA INC.		HALIBUT A-1		31'		Coordinates: Lat 38°23'56"S, Long 148°18'59"E Section, Township, Range: MURRAY PARISH, VICTORIA County: ARAGUAY FIELD Datum: MEAN SEA LEVEL										
Record No.	Shot No.	Time of Shot	Dgm	Ds	tus	tr	Reading	Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity	Elevation Well			
1	A	08-23	3035	5	.001	.230	.410	G	2979	1150	.324	.934	.373	5	.001	.324	.373	3004	1001	.385	7800	7800	Elevation Shot			
12	B	12-09	3034	5	.001	.215	.408	G	2993	1080	.362	.940	.384	5	.001	.362	.384		992	.077	10,000		Elevation Datum Plane			
2	A	08-56	4027	5	.001	.231	.503	F	3971	1155	.290	.960	.482	5	.001	.484	.487	3996				3260	Elevation Well			
11	B	11-50	4076	5	.001	.218	.500	G	3990	1070	.273	.965	.482	5	.001	.483	.483		1769	.147	12,000		Elevation Datum Plane			
3	A	09-25	5776	5	.001	.215	.643	G	3760	1075	.187	.983	.622	5	.001	.623	.631	5765				1140	Elevation Well			
10	B	11-25	5795	5	.001	.216	.639	F	5759	1080	.183	.983	.628	5	.001	.627	.627		1215	.121	10,040		Elevation Datum Plane			
4	A	09-45	7011	5	.001	.229	.763	P	6975	1125	.161	.987	.753	5	.001	.754	.752	6980				9280	Elevation Well			
9	B	11-10	7011	5	.001	.207	.758	P	6975	1035	.148	.969	.747	5	.001	.750	.750		481	.049	9820		Elevation Datum Plane			
5	A	10-00	7492	5	.001	.227	.811	F	7156	1135	.152	.987	.801	5	.001	.802	.801	7161				9310	Elevation Well			
8	B	10-55	7492	5	.001	.213	.805	F	7456	1065	.143	.990	.798	5	.001	.799	.799		759	.078	12,300		Elevation Datum Plane			
6	A	10-20	8451	5	.001	.221	.887	G	8445	1105	.121	.991	.880	5	.001	.881	.879	8420				1190	Elevation Well			
7	B	10-35	8451	5	.001	.205	.883	F	8445	1010	.120	.993	.876	5	.001	.877	.877						Elevation Datum Plane			
			RELIEF		{ Water Level - DOWN } { Well - Phone - DOWN }																					
* ALTERNATIVE INTERPRETATION OF 7011 (KB) CHECK SHOTS:																										
4	A	09-45	7011	5	.001	.227	.756	P	6975	1125	.161	.987	.746	5	.001	.747	.745	6980				9365	Elevation Well			
9	B	11-10	7011	5	.001	.207	.751	P	6975	1035	.148	.969	.742	5	.001	.743	.743						Elevation Datum Plane			
(DISCREPANCY BY 5' IN 1987 - EXAMINE "ERROR" TABLE)																										



Dgm = Geophone depth measured from well elevation  
 Dgs = " " " " shot  
 Dgd = " " " " datum  
 Ds = Depth of shot  
 De = Shot hole 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  
 tr = 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  
 Dgd = Dgm - Dist Δe; tan i = H / Dgs  
 Tgs = cos i \* Ts; Vert. travel time from shot to geophone  
 Tgd = Tgs \* Δsd / V  
 Dgd = Dgm - Δsd  
 Vi = Interval velocity = ΔDgd / ΔTgd  
 Va = Average = Dgd / Tgd

Surveyed by: UNITED GEOPHYSICAL  
 Date: 5 August 1987  
 Weathering Data:  
 Casing Record: 2045'  
 4 of 18

\* G - Good  
 F - Fair  
 P - Poor

REFS. Shot 115

5 of 18

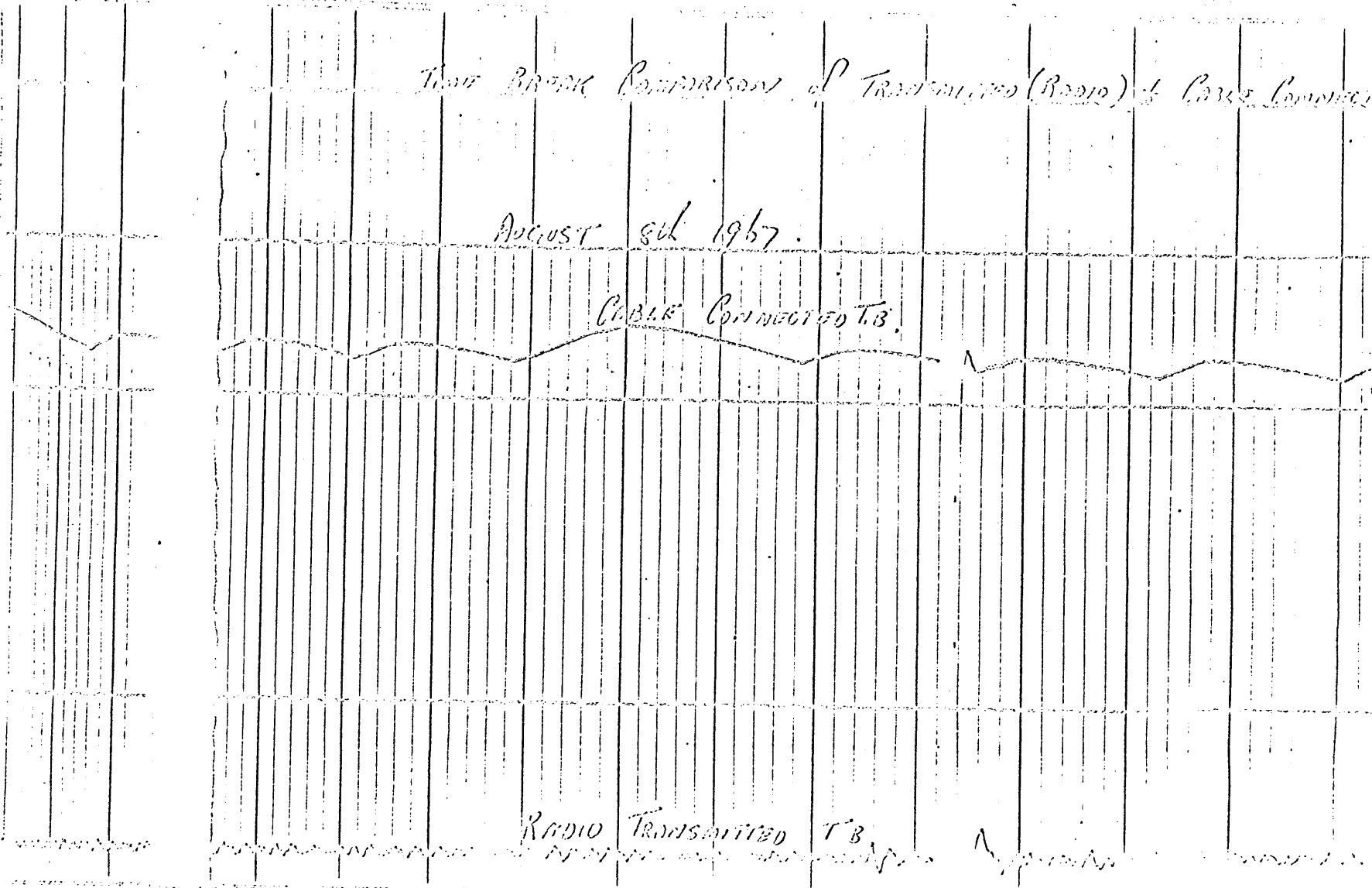
HALIBUT -1

Time Break Comparison of Transmitted (Radio) & Cable Connected

AUGUST 8th 1967

CABLE CONNECTED T.B.

RADIO TRANSMITTED T.B.



OBSERVER'S REPORT

Date Sept 11/68 Time Left Town \_\_\_\_\_ Time Arrived Field \_\_\_\_\_ Sheet No. 1 Of 1

Seismograph Party No. 11-1 Base San Francisco Province \_\_\_\_\_ Prospect Halibut III

Truck No. \_\_\_\_\_ Inst. Series No. \_\_\_\_\_ Type Geo. \_\_\_\_\_ Geo. Group \_\_\_\_\_ /Trace \_\_\_\_\_ Wind 11.5 Weather 2.0

LINE AND SHOT POINT NO.	BEARING TOP BOTTOM	SPREAD	GROUP SEPARATION	RECORD No.	TAPE No.	FILTER	CHARGE	DEPTH	TIME	REMARKS
		3025					33	5		
1		5035	A	(2000) (1000)		3	33	5	0535	-20 db WITH METERING 1050 Sec. 7 Well Record
2		6057	A				33	5	0556	-40 db
3		5775	A			400	33	5	0925	-32 db
4		7110	B			001	33	5	0945	-24 db
5		7110	A				33	5	1000	-20 db
6		8450	A				33	5	1020	-18 db
7		8450	B	(2000) (1000)		4	23	5	1030	-18 db
8		7490	B				33	5	1045	-22 db
9		7010	B				33	5	1110	-20 db
10		5775	B				33	5	1125	-30 db
11		11025	B				33	5	1150	-34 db
12		3033	B				23	5	1200	-38 db
TOTALS				13			1433			13 caps 41580 str

**RE-NAMED  
(AUG. 1968)  
HALIBUT 1**

Distribution \_\_\_\_\_ Time Left Field \_\_\_\_\_ Time Arrived Town \_\_\_\_\_ Signed [Signature] OBSERVER

ORIGINAL -- To Client  
 DUPLICATE -- Party File  
 TRIPLICATE -- Supervisor  
 QUADRUPLICATE -- Remains in Book

REPORT ALL ACCIDENTS, HOWEVER SLIGHT

PARTY CHIEF/MGR.

6/18

7 of 18

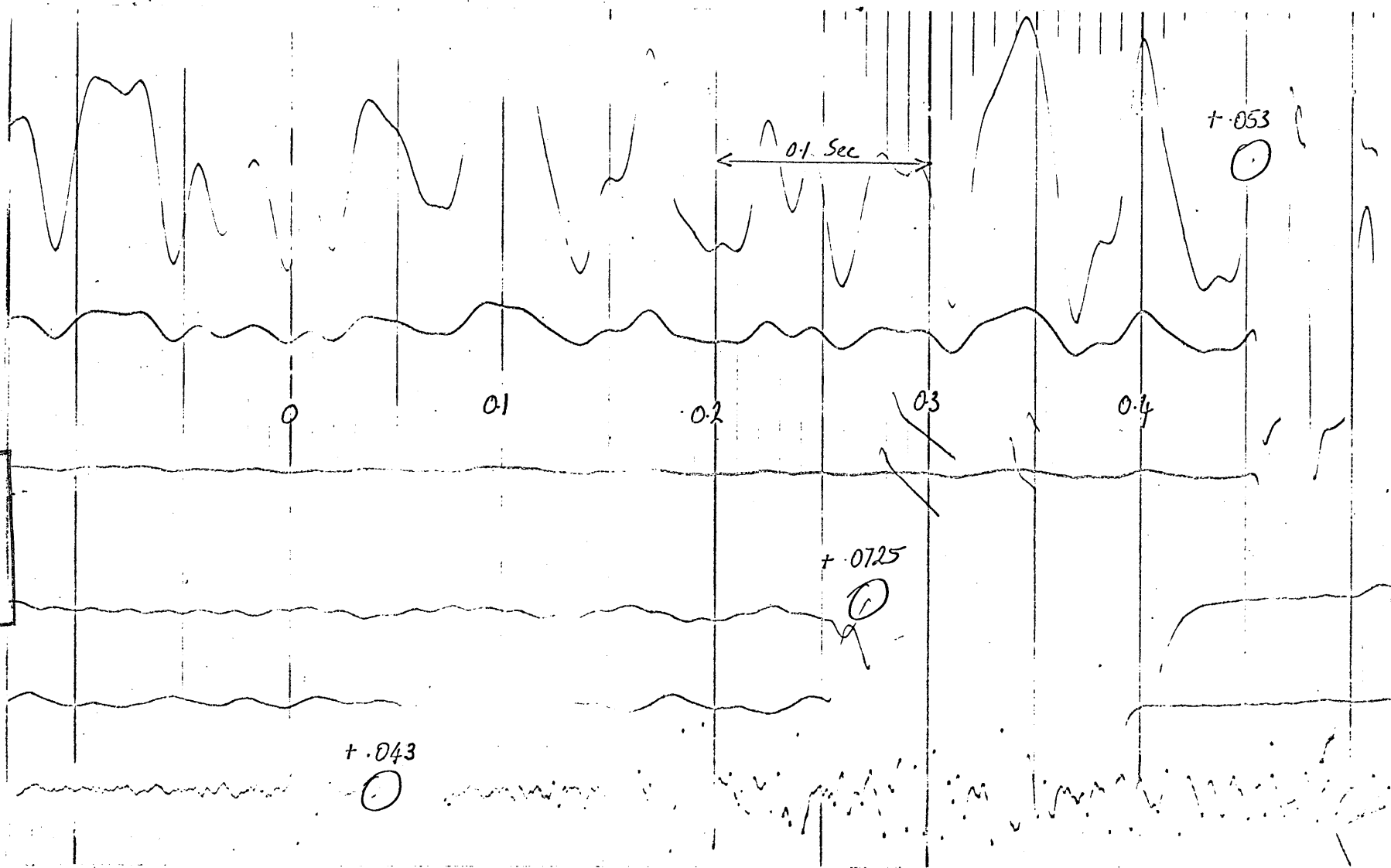
# Halibut A-1

SHOT 1.

OFFSET 1000' N.W.

GEOPHONE 3035'

08-35 5-8-67



RE-NAMED  
 (AUG. 1968)  
**HALIBUT 1**

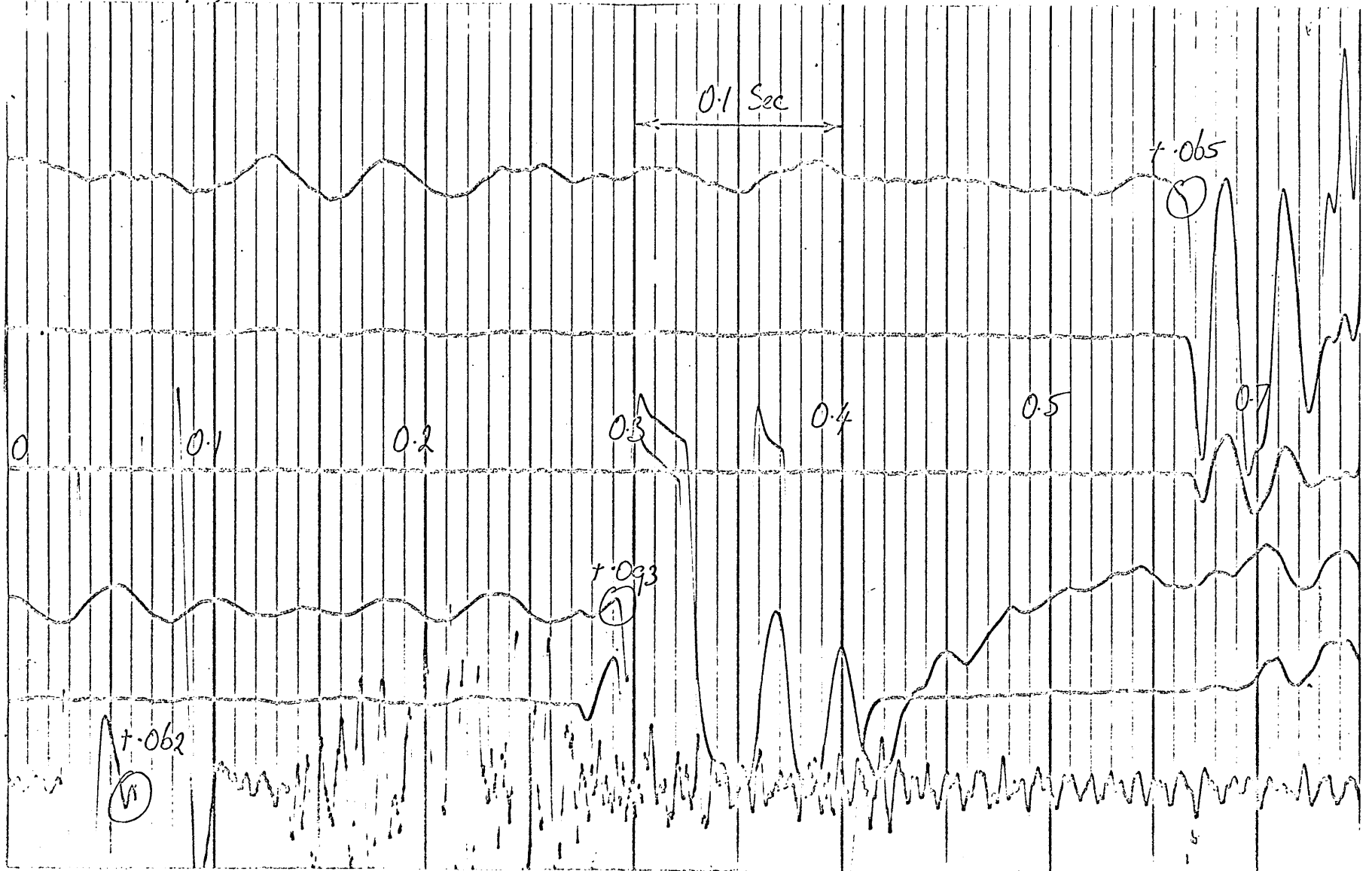
8 of 18.

SHOT 2.

OFFSET 1000' N.W.

GEOPHONE 4027'

08.56 5-8-67



PE904845

This is an enclosure indicator page.  
The enclosure PE904845 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904845 has the following characteristics:

- ITEM\_BARCODE = PE904845
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Velocity Survey
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 3
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = United Geophysical Corporation
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904846

This is an enclosure indicator page.  
The enclosure PE904846 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904846 has the following characteristics:

- ITEM\_BARCODE = PE904846
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Velocity Survey
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 4
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = United Geophysical Corporation
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904847

This is an enclosure indicator page.  
The enclosure PE904847 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904847 has the following characteristics:

- ITEM\_BARCODE = PE904847
- CONTAINER\_BARCODE = PE904839
- NAME = Halibut 1 Velocity Survey
- BASIN = GIPPSLAND
- PERMIT = VIC/L5
- TYPE = WELL
- SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 6
- DATE\_CREATED =
- DATE\_RECEIVED =
- W\_NO = W507
- WELL\_NAME = Halibut-1
- CONTRACTOR = United Geophysical Corporation
- CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)



PE904848

This is an enclosure indicator page.  
The enclosure PE904848 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904848 has the following characteristics:

- ITEM\_BARCODE = PE904848
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Velocity Survey
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 5
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = United Geophysical Corporation
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904849

This is an enclosure indicator page.  
The enclosure PE904849 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904849 has the following characteristics:

ITEM\_BARCODE = PE904849  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Velocity Survey  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = VELOCITY\_CHART  
DESCRIPTION = Halibut 1 Velocity Survey  
REMARKS = Shot 7  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR = United Geophysical Corporation  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904850

This is an enclosure indicator page.  
The enclosure PE904850 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904850 has the following characteristics:

ITEM\_BARCODE = PE904850  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Velocity Survey  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = VELOCITY\_CHART  
DESCRIPTION = Halibut 1 Velocity Survey  
REMARKS = Shot 8  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR = United Geophysical Corporation  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904851

This is an enclosure indicator page.  
The enclosure PE904851 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904851 has the following characteristics:

- ITEM\_BARCODE = PE904851
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Velocity Survey
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 9
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = United Geophysical Corporation
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE904852

This is an enclosure indicator page.  
The enclosure PE904852 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904852 has the following characteristics:

- ITEM\_BARCODE = PE904852
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Velocity Survey
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Velocity Survey
- REMARKS = Shot 10
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = United Geophysical Corporation
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

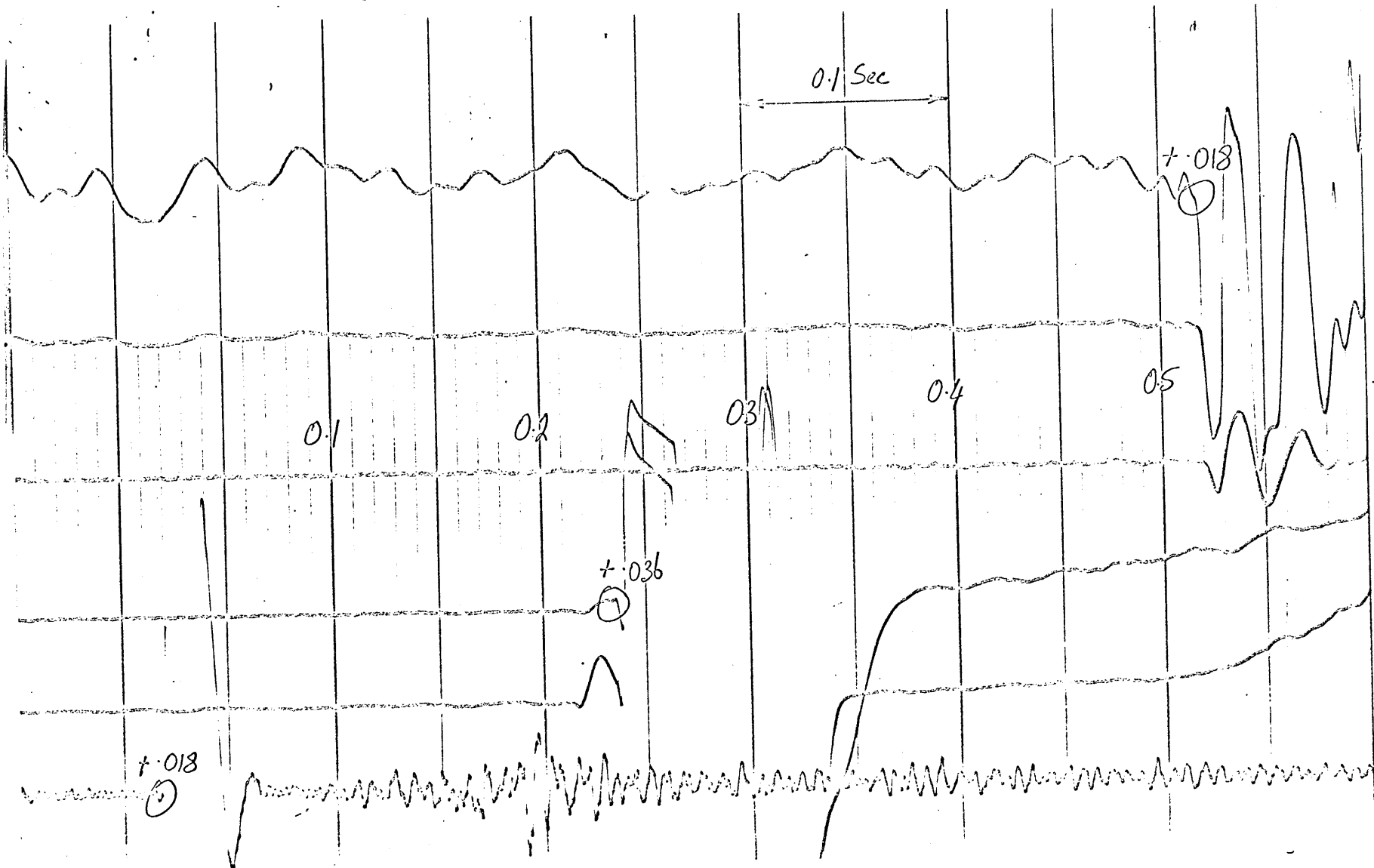
17 of 18

SHOT 11.

OFFSET 1000' S.E.

GEOPHONE 4026'

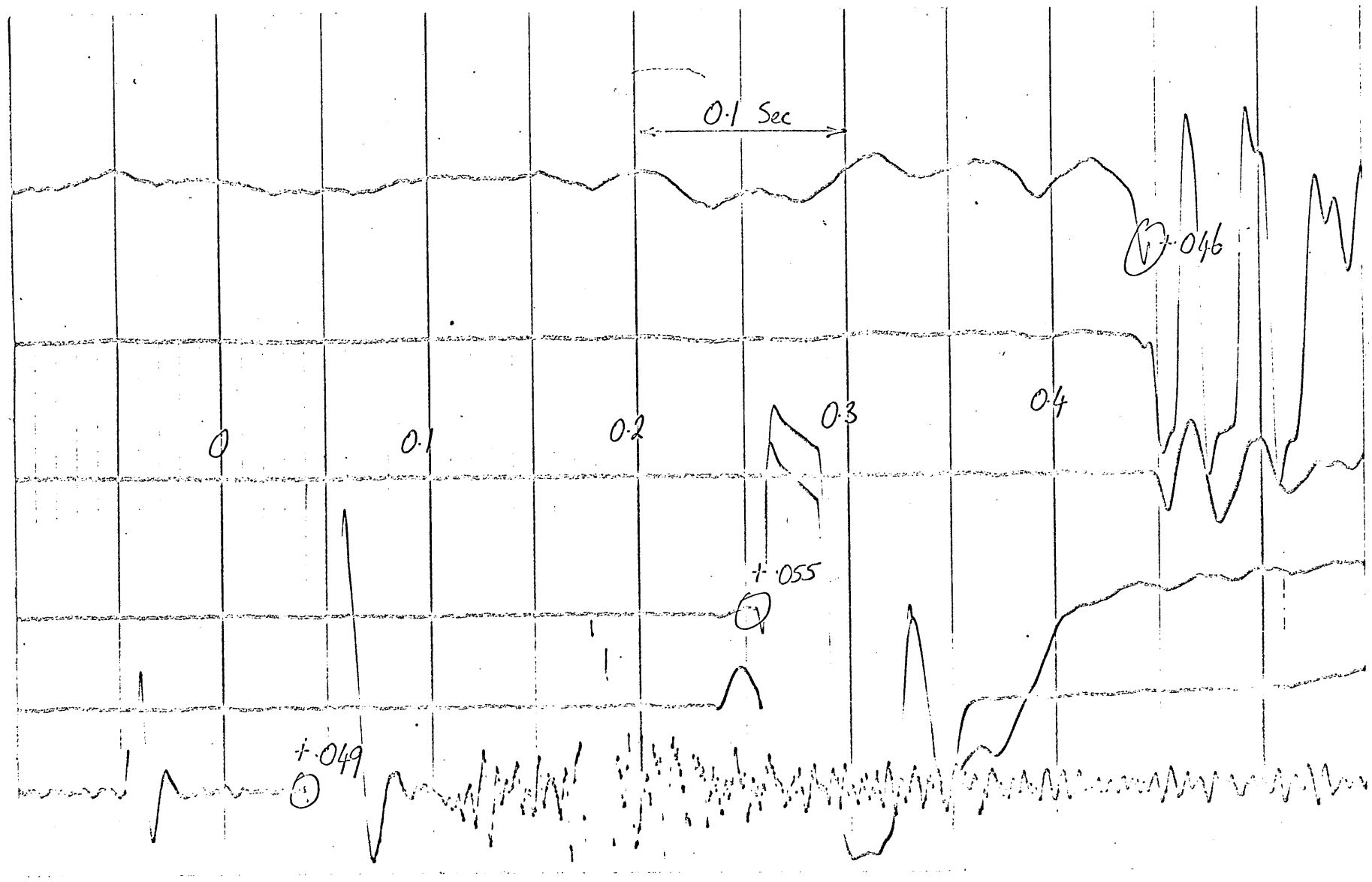
11-50 5-8-67



RE-NAMED  
(AUG. 1963)  
HALIBUT 1

818  
18 of 18

S110T 12.  
OFFSET 1000' S.E.  
GEOPHONE 3034'  
12.00 5-8-67



RE-NAMED  
(AUG 1968)  
HALIBUT 1

PE904853

This is an enclosure indicator page.  
The enclosure PE904853 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904853 has the following characteristics:

- ITEM\_BARCODE = PE904853
- CONTAINER\_BARCODE = PE904839
- NAME = Time - Depth Curve
- BASIN = GIPPSLAND
- PERMIT = VIC/L5
- TYPE = WELL
- SUBTYPE = VELOCITY\_CHART
- DESCRIPTION = Halibut 1 Time - Depth Curve
- REMARKS =
- DATE\_CREATED =
- DATE\_RECEIVED =
- W\_NO = W507
- WELL\_NAME = Halibut-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)



PE904854

This is an enclosure indicator page.  
The enclosure PE904854 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904854 has the following characteristics:

ITEM\_BARCODE = PE904854  
CONTAINER\_BARCODE = PE904839  
NAME = Time - Depth Curve  
BASIN = GIPPSLAND  
PERMIT = VIC/L5  
TYPE = WELL  
SUBTYPE = VELOCITY\_CHART  
DESCRIPTION = Halibut 1 Time - Depth Curve  
REMARKS = Client Copy. Confidential information  
removed. As copy is reduced in size  
from the original the vertical scale  
varies.  
DATE\_CREATED =  
DATE\_RECEIVED =  
W\_NO = W507  
WELL\_NAME = Halibut-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

8. Enclosures .

PE904855

This is an enclosure indicator page.  
The enclosure PE904855 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE904855 has the following characteristics:

ITEM\_BARCODE = PE904855  
CONTAINER\_BARCODE = PE904839  
    NAME = Completion Coregraph  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = DIAGRAM  
DESCRIPTION = Halibut 1 Completion Coregraph  
REMARKS = Cores 2-16.  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR = Core Laboratories, INC.  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE603186

This is an enclosure indicator page.  
The enclosure PE603186 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE603186 has the following characteristics:

- ITEM\_BARCODE = PE603186
- CONTAINER\_BARCODE = PE904839
  - NAME = Halibut 1 Grapholog (Mud Log)
  - BASIN = GIPPSLAND
  - PERMIT = VIC/L5
  - TYPE = WELL
  - SUBTYPE = MUD\_LOG
- DESCRIPTION = Halibut 1 Grapholog (Mud Log)
- REMARKS =
- DATE\_CREATED =
- DATE\_RECEIVED =
  - W\_NO = W507
  - WELL\_NAME = Halibut-1
  - CONTRACTOR = Core Laboratories, INC.
  - CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE603187

This is an enclosure indicator page.  
The enclosure PE603187 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE603187 has the following characteristics:

ITEM\_BARCODE = PE603187  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Grapholog (Mud Log)  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = MUD\_LOG  
    DESCRIPTION = Halibut 1 Grapholog (Mud Log)  
    REMARKS = Second copy (incomplete)  
DATE\_CREATED =  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
    CONTRACTOR = Core Laboratories, INC.  
    CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

PE603188

This is an enclosure indicator page.  
The enclosure PE603188 is enclosed within the  
container PE904839 at this location in this  
document.

The enclosure PE603188 has the following characteristics:

ITEM\_BARCODE = PE603188  
CONTAINER\_BARCODE = PE904839  
    NAME = Halibut 1 Hydrocarbon Analysis  
    BASIN = GIPPSLAND  
    PERMIT = VIC/L5  
    TYPE = WELL  
    SUBTYPE = MUD\_LOG  
DESCRIPTION = Halibut 1 Hydrocarbon Analysis-  
    Formation Description, Mud Data, Drill  
    Stem Tests, etc.  
REMARKS =  
DATE\_CREATED = 29/08/67  
DATE\_RECEIVED =  
    W\_NO = W507  
    WELL\_NAME = Halibut-1  
CONTRACTOR = Core Laboratories, INC.  
CLIENT\_OP\_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)