BEACH PETROLEUM N.L.

(Incorporated in South Australia)

PETROLEUM DIVISION

CALLISTA No. 1

Well Completion Report
Text & Appendices

by B. L. Rayner
Beach Petroleum N.L.
October, 1988

CALLISTA NO. 1

WELL COMPLETION REPORT

by

B. L. RAYNER

Beach Petroleum N.L.
345 George Street,
SYDNEY NSW 2000

October, 1988.

CONTENTS

FIGURES

APPENDICES

ENCLOSURES

		Scale
1.	Composite Well Log.	1:1000
2.	Gearhart Mud Log.	1:500
3.	Gearhart Wireline Logs.	
	BCS-GR	1:200 & 1:500
	DLL-MSFL-GR	1:200 & 1:500
	SLD-CNL-GR	1:200 & 1:500

PEP 104 OTWAY BASIN	CALLISTA NO. 1 BEACH PETROLEUM N.L.
Status: P & A, Dry Hole Hole Size: 12¼" to 8½" 1800m Casing Shoe: 9 5/8" @ 299m Plugs: 1690-1640m, 1380-1330m, 950-900m, 310-355m, surface	Location: Lat. 38°28'0.22" Long 142°50'12.64"E Seismic: SP100, MD84-112 Elevation: 77.0m GL 81.9 KB A.S.L. Spudded: 27-3-88 Rig Release: 7-4-88 Rig: GDSA Rig 2

Rock Unit	KB(m)	Thickness	Rock Unit	KB(m)	Thickness
Heytesbury Gp			Sherbrook Gp		
Port Campbell	surface	169.1	Paaratte Fm	960	308
Gellibrand Marl	174	313	Skull Ck Mdst Mbr	1268	101
Clifton Fm	487	16	Nullawarre Gs Mbr	1369	211
			Belfast Mdst	1580	28
Nirranda Gp			Flaxmans Fm	1608	63
			Waarre Sst	1671	64
Narrawaturk Marl	503	44			
Mepunga Fm	547	84	Otway Gp		
Wangerrip Gp			Eumeralla	1735	+65
Dilwyn Fm	631	245	Total Depth (Driller)		1800m
Pember Mdst Mbr	876	33			
Pebble Point Fm	909	51	Total Depth (Logger)		1800m

Logs: DLL/MSFL, BCS, SLD/CNS, SWC, Velocity Survey, Mudlog

Tests: Nil

Cores: 23 SWC, nil conventional

Conclusions

Callista No. 1 was a Waarre Sandstone play drilled largely on the strength of the amplitude anomaly observed on the seismic.

No significant hydrocarbons were observed in the well.

The seismic amplitude anomaly coincided with a lithology change at the Belfast Mudstone/Flaxmans Fm. interface and is not representative of gas saturated sands as is seen in PPL 1.

Prepared by: B. L. Rayner Date: October, 1988

SUMMARY

Callista No.1 was drilled as a wildcat exploration well in PEP 104, Otway Basin, Victoria.

Participants in the well were Beach Petroleum N.L. (Operator), Gas and Fuel Exploration N.L. and Bridge Oil Limited.

Callista No.1, was located approximately 14km northwest of the Port Campbell gasfield.

The Waarre Sandstone, which was the primary target, was predicted to be gas bearing by seismic interpretation.

Drilling commenced on the 27th of March, 1988 and reached a total depth of 1800m (KB) on the 5th of April, 1988.

At total depth the following wireline logs were run: Dual Laterolog/Microspherically Focused Resistivity, Borehole Compensated Sonic, Spectral Lithodensity/Compensated Neutron, Velocity Survey and Sidewall Cores.

No formation tests or conventional coring operations were performed. Significant shows were not observed during drilling and all horizons are interpreted to be water saturated.

The Callista No.1 well was plugged and abandoned as a dry hole, and the rig was released on the 7th of April, 1988.

1. INTRODUCTION

The Callista No. 1 well was a Waarre Sandstone play drilled primarily on the strength of an amplitude anomaly observed on the seismic.

It has been recognised that some Waarre Sandstone gas acumulations in the eastern Otway Basin can be related to a characteristic high amplitude seismic event at the Waarre Sandstone level. It is also apparent that this high amplitude seismic event can extend beyond the structural boundaries of a feature suggesting an element of stratigraphic control to the gas accumulation.

The Callista prospect arose from a detailed seismic modelling and geological study undertaken in nearby PPL-1 and PEP 108 and extended into PEP 104.

The seismic modelling involved evaluation Waarre Sandstone amplitude anomalies on seismic lines, considering the effect of a gas accumulation in the Waarre Sandstone through the seismic velocity inversion method and estimation of Poissons ratio at that level by the SAMPLE method (Seismic Amplitde Measurement for Primary Lithology Estimation) to predict the presence of hydrocarbons.

In PEP 104, the Callista region was one area which showed high prospectivity for gas in the Waarre Sandstone using the above seismic modelling techniques. The proposed location was recognised to be on the flank of a small "Base Upper Cretaceous" faulted culmination but modelling indicated a more extensive gas accumulation.

Geologically, the Waarre Sandstone in the Callista region was known to be highly variable in terms of reservoir quality. Westgate No.1A, 5km east and Rowans No. 1, 4.5km west of the proposed location, both proved to have a relatively thin and poorly developed Waarre Sandstone reservoir section compared to the Port Campbell area. Nullawarre-3, 3.75km to the north,however, displays good SP deflection and presumably a porous and permeable Waarre Sandstone.In all cases the Waarre Sandstone was capped by an effective seal rock, the Belfast Mudstone and underlain by the regional source rock, the Eumeralla Formation.

Hence while it was recognised pre-drill that the Waarre Sandstone in the Callista region may not have been as well developed as it is elsewhere, the combination of seal, reservoir and source rocks was recognised to be adequate for a hydrocarbon accumulation.

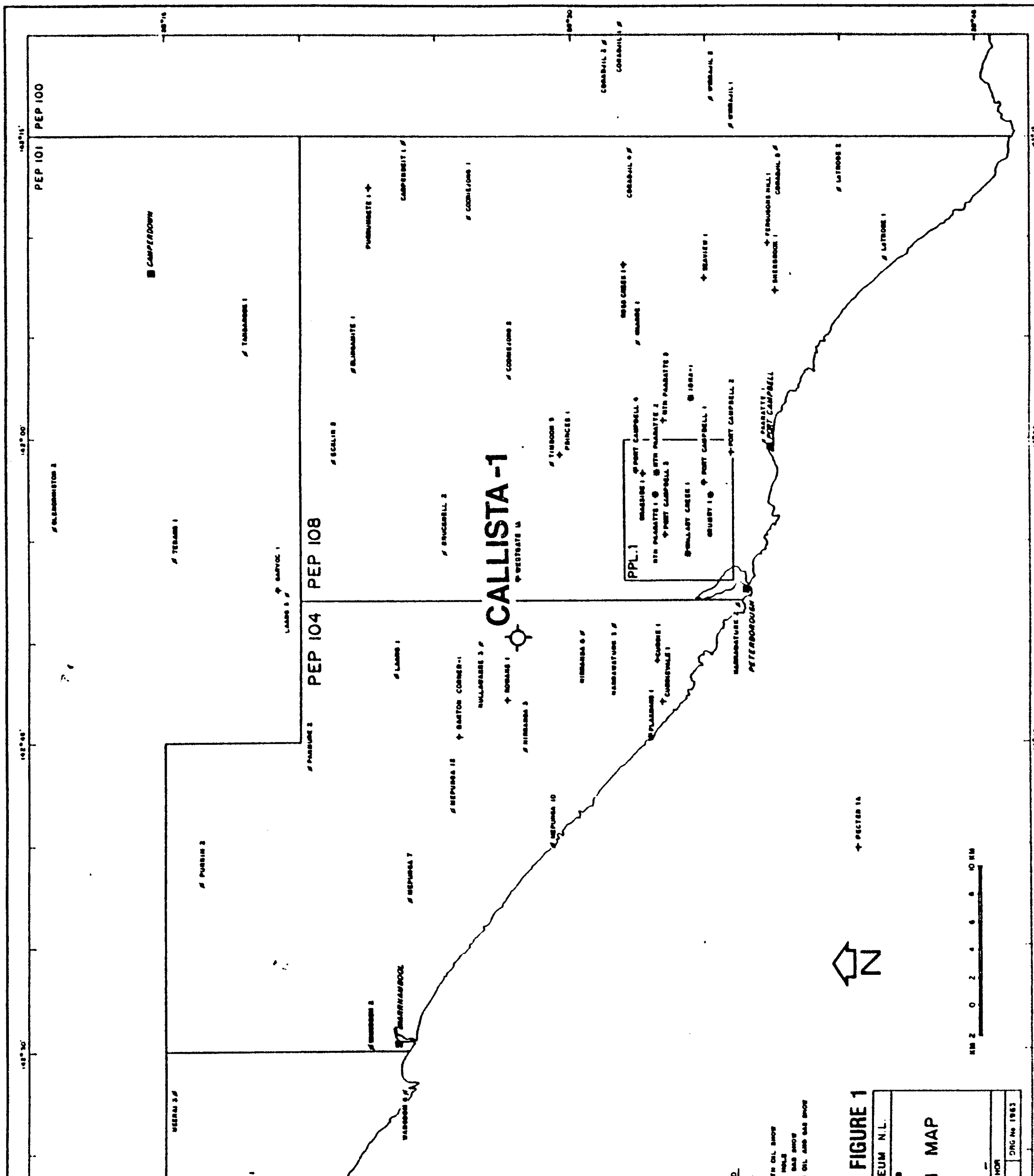
2. WELL HISTORY

2.1 Location (See Figure 1)

Co-ordinates:	Latitude 38° 28' 0.22"S Longitude 142° 50' 12.64"E
Geophysical Control:	Shot Point 100 Seismic Line MD84-112
Real Property Description:	County of Heytesbury Parish of Nullawarre Shire of Warrnambool
Propery Owner:	A.S. Payne Rowans Road, Nullawarre VIC 3268

2.2 General Data (See Figure 2)

Well Name and Number:	Callista No.1
Operator:	Beach Petroleum N.L. Level 7, 345-355 George Street SYDNEY NSW 2000
Participants:	Gas and Fuel Exploration N.L. 151 Flinders Street MELBOURNE VIC 3000 Bridge Oil Limited 60 Margaret Street SYDNEY NSW 2000
Elevation:	Ground Level 77.0m ASL Kelly Bushing 81.9m ASL (unless otherwise stated, all depths refer to K.B.)
Total Depth:	Driller 1800m Wireline Logger 1800m


CALLISTA-1
PEP 100
PEP 101
PEP 104
PEP 108
PEP 111
PPL.1
CAMPERDOWN
PORT CAMPBELL
PETERBOROUGH
WARRNAMBOOL
N
FIGURE 1
BEACH PETROLEUM N.L.
PEP 104-108
LOCATION MAP

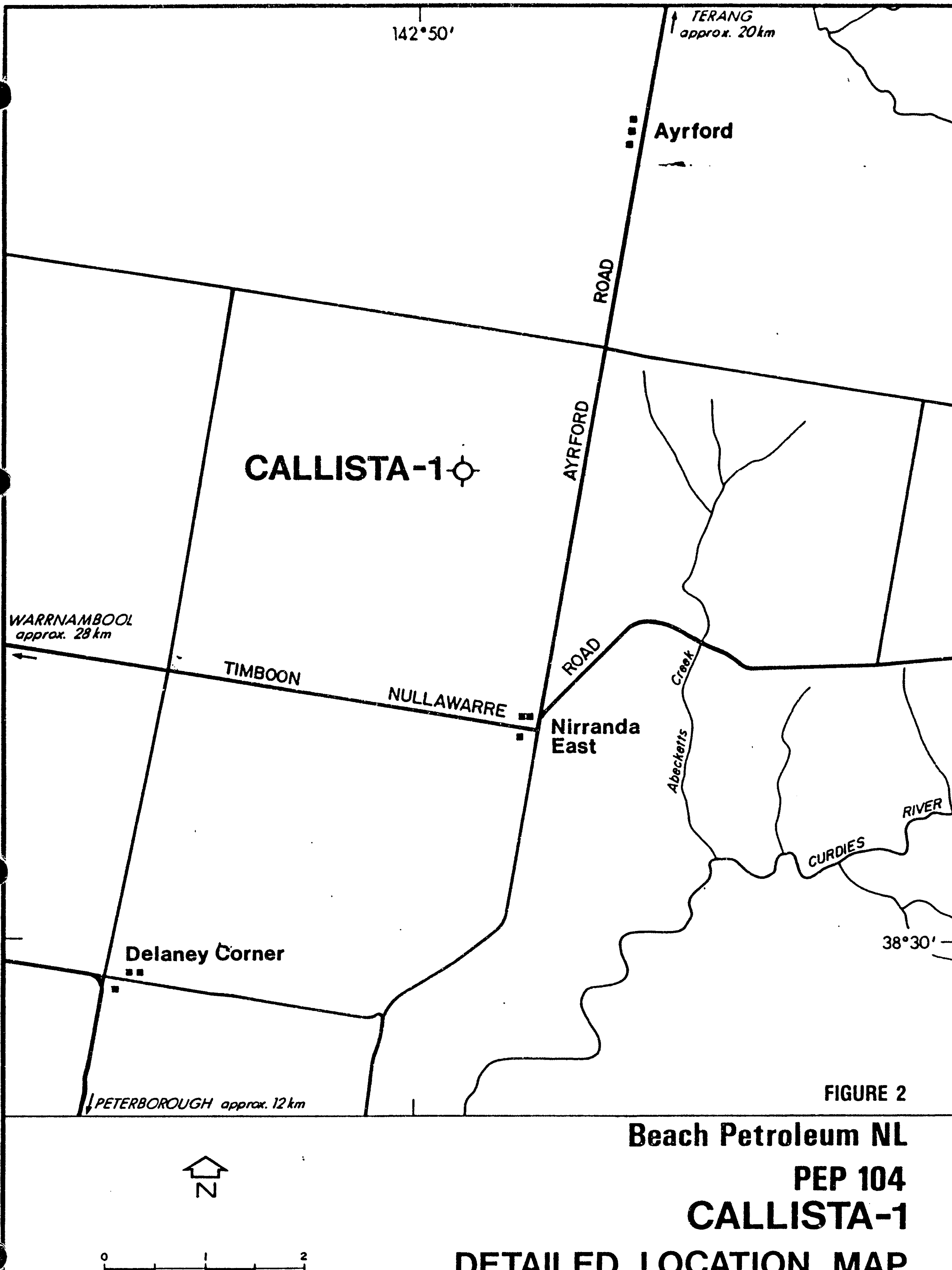


FIGURE 2

Beach Petroleum NL

PEP 104

CALLISTA-1

DETAILED LOCATION MAP

DATE : OCTOBER 1988 DRAWN : LG

2.2 General Data (cont)

Drilling Commencement:	27th March, 1988 @ 1200 hours
Total Depth Reached:	5th April, 1988 @ 1300 hours
Rig Released:	7th April, 1988 @ 1230 hours
Drilling Time to T.D.:	10 days
Status:	Plugged and abandoned, dry hole.

2.3 Drilling Data (See also Appendices 1 and 2)

2.3.1. Drilling Contractor

Gearhart Drilling Services Australia

2.3.2 Drilling Rig

G.D.S.A. Rig 2

2.3.3 Casing and Cementing Details

A 16" conductor pipe as set at 9.0m prior to rig up.

Surface Casing

Size:	$9^5/8$"
Weight and Grade:	40lb/ft BTC 8rd
Centralisers:	296m, 282m and 273m
Float Collar:	287m
Shoe:	299m
Cement:	195 sacks Class "A" with 2.5% prehydrated gel and 162 sacks Class "A" neat.
Method:	Single plug displacement. (Top plug only).
Equipment:	Halliburton Services

2.3.3 Casing and Cementing Details (cont.)

Cement Plugs

Plug No.1

Interval:	1690 - 1640m
Cement:	55 sacks Class "A" neat
Method:	Balanced
Tested:	No

Plug No.2

Interval:	1380 - 1330m
Cement:	55 sacks Class "A" neat
Method:	Balanced
Tested:	No

Plug No.3

Interval:	950m - 900m
Cement:	61 sacks Classs "A" neat
Method:	Balanced
Tested:	No

Plug No.4

Interval:	310m - 355m
Cement:	80 sacks Class "A" plus 1% CaCl2
Method:	Balanced
Tested:	10,000lbs weight

Plug No.5

Interval:	Surface
Cement:	25 sacks Class "A" neat.

2.3.4 Drilling Fluid

The hole was drilled with a freshwater-bentonite-polymer mud system. Some tight hole was experienced during trips but wireline logging was completed without incident. The Caliper log showed the hole to be very close to gauge. (See Appendix 3 for details).

2.3.5 Water Supply

Drilling water was obtained from a dam close to the wellsite.

2.4 Formation Sampling and Testing

2.4.1 Cuttings

Cuttings samples were collected at 10 metre intervals from the surface to 870m and at 5m intervals from 870m to T.D. Each sample was washed, air dried, divided into five splits, four of which were stored in labelled polythene bags and one which was stored in plastic trays. The sets of washed and dried samples in polythene bags were distributed to the following:

Gas and Fuel Exploration N.L. Bridge Oil Ltd. Victorian Department of Industry, Technology and Resources.

Beach retained one set of washed and dried cuttings in polythene bags and another in plastic trays.

In addition, from surface to T.D., unwashed samples were collected at 10 metre intervals. These samples were stored in labelled cloth bags, air dried and retained by Beach.

2.4.2. Cores

(i) No conventional coring operations were performed.

(ii) Twenty-four sidewall cores were attempted, twenty-three were recovered and one misfired. Listed below are the depths and recovery of these sidewall cores. (See Appendix 4 for description)

SWC No.	Depth (m)	Recovery (cm)
1	1794	2.5
2	1792	3.5
3	1788	3.2
4	1737	3.0
5	1734	3.0
6	1731	3.0
7	1722	2.8
8	1719.5	2.5
9	1715	4.0
10	1699.5	2.8
11	1694	3.0
12	1689	3.2
13	1681.5	2.7
14	1678	2.1
15	1674	2.4
16	1665	3.5
17	1616	3.0
18	1605	3.2
19	1583	3.1
20	1370.5	2.3
21	1153	1.8
22	930	3.0
23	misfire	nil
24	903	4.0

2.4.3 Tests

No tests were performed.

2.5 Logging and Surveys (See Enclosure 1)

2.5.1 Mud Logging

A standard skid-mounted Gearhart Geodata Division unit was used to provide penetration rate, continuous mud gas monitoring, intermittent mud and cuttings gas analysis, pump rate and mud volume data. The mudlog is included as Enclosure 2.

2.5.2 Wireline Logging

Wireline logging was performed by Gearhart Pty Ltd using a truck mounted unit. One logging suite was performed at T.D. Details are listed below.

Suite 1	Interval
Dual Laterolog/Microspherically Focused Resistivity Log (DLL/MSFL)	1800-299m (GR to surface)
Borehole Compensated Sonic Log (BCS/GR)	1800-299m
Spectral Lithodensity/ Compensated Neutron Log (SLD/CNL)	1800-1500m 1015-850m

2.5.3 Deviation Surveys

Regular hole deviation surveys were conducted, the results of which are listed below:

Depth (m)	Deviation (°)	Depth (m)	Deviation (°)
58	0.00	734	0.25
130	0.25	933	0.75
197	0.00	989	1.00
252	0.25	1200	0.75
290	0.25	1398	0.75
498	0.25	1615	0.75
526	0.25	1794	1.00

2.5.4 Velocity Survey

A velocity survey was carried out by Velocity Data Pty Ltd, the result of which is included as Appendix 5.

3. RESULTS OF DRILLING

3.1 Stratigraphy

The following stratigraphic intervals have been delineated using clay analysis, palynology, penetration rate, lithology and wire-line log interpretation. (See Figures 3 & 4, Appendices 6 & 7)

Group	Formation	Depth (m)	Thickness (m)
Heytesbury	Port Campbell Limestone	Surface	169.1
	Gellibrand Marl	174	313
	Clifton	487	16
Nirranda	Narrawaturk	503	44
	Mepunga	547	84
Wangerrip	Dilwyn	631	245
	Pember Mudstone Member	876	33
	Pebble Point	909	51
Sherbrook	Paaratte	960	308
	Skull Creek Mudstone Member	1268	101
	Nullawarre Greensand Member	1369	211
	Belfast Mudstone	1580	28
	Flaxmans	1608	63
	Waarre	1671	64
Otway	Eumeralla	1735	+65
	T.D.	1800	

3.2 Lithological Descriptions

3.2.1 Heytesbury Group (Surface to 503)

Port Campbell Limestone — Surface to 174m

CALCARENITE, light grey, mottled yellow in part, friable to moderately hard, granular, abundant fossil fragments, trace glauconite, slightly silty in part, poor visual porosity.

Gellibrand Marl — 174m to 487m

CALCILUTITE, medium grey, light grey green, medium brown grey, soft to firm, sticky in part, mircomicaceous in part, carbonaceous detritus in part, abundant fossil fragment (mainly echinoid spines and bryozoa), with minor CALCARENITE as above.

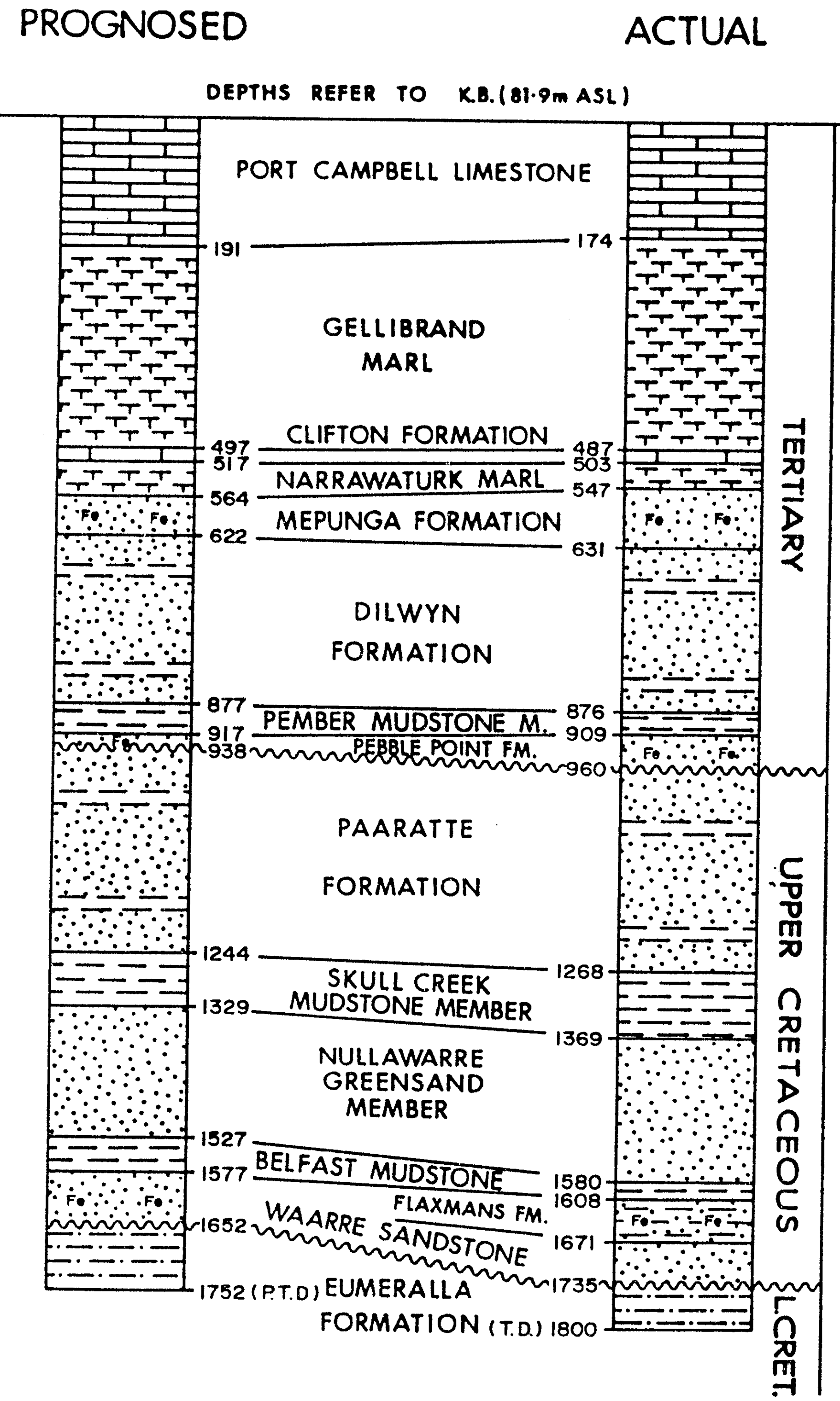


FIGURE 3

Beach Petroleum NL

PEP 104

CALLISTA-1

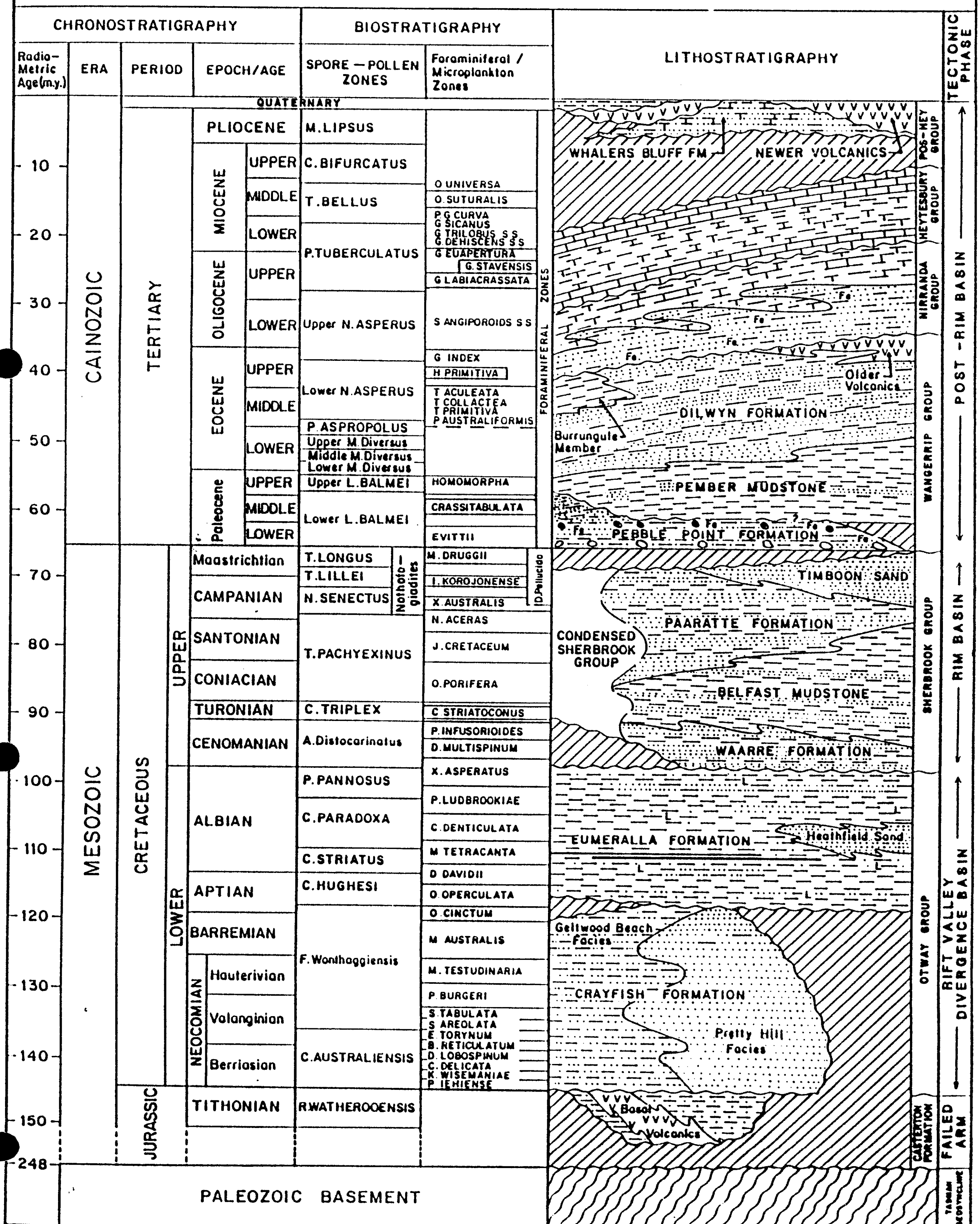
PROGNOSED AND ACTUAL STRATIGRAPHY

AUTHOR : B. RAYNER DATE : OCTOBER 1988 DRAWN : V.T.

BEACH PETROLEUM N.L.

STRATIGRAPHIC TABLE

FIGURE 4



BASE MAP OT 3637

after AHMAD TABASSI. JUNE 1987
DRG No. OT. 3820 (F)

Clifton Formation 487m to 503m

CALCARENITE, medium to dark orange brown, light yellow orange in part, friable to hard with iron rich matrix and cement, common fine to very coarse, rounded iron oxide pellets and medium to very coarse iron oxide stained quartz grains, poor to fair visual porosity.

3.2.2 Nirranda Group (503m to 631m)

Narrawaturk Marl 503m to 547m

CALCILUTITE, medium grey green, medium to dark brown grey in part, firm, subfissile, common fossil fragments, common fine, subrounded to rounded quartz grains.

Mepunga Formation 547m to 631m

SANDSTONE, quartzose, very light brown, fine to very coarse, dominantly medium to coarse grained, loose, subangular to rounded, moderately sorted, translucent quartz, trace iron oxide pellets, good visual porosity with minor SILTSTONE, light to dark brown, soft, slightly sticky, slightly calcareous, argillaceous in part, grades to very fine grained SANDSTONE.

3.2.3 Wangerrip Group (631m to 960m)

Dilwyn Formation 631m to 876m

SANDSTONE, quartzose, off white, light to medium grey, loose, medium to very coarse grained, subangular to subrounded, moderate to well sorted quartz, weak siliceous and calcite cement in part, pyritic in part, argillaceous in part, good to fair visual porosity, with minor SILTSTONE, dark brown to black, grey brown in part, firm to hard, subfissile, very carbonaceous, pyritic in part, micromicaceous, arenaceous in part, with minor DOLOMITE and CALCILUTITE.

Pember Mudstone Member 876m to 909m

CLAYSTONE, dark grey brown, dark grey green, soft, firm in part, sticky, very carbonaceous, micromicaceous in part, slightly calcareous, trace to abundant, very fine quartz grains, trace very dark green, fine grained, rounded ? chamositic pellets.

Pebble Point Formation 909m to 960m

SANDSTONE, quartzose, light to medium brown, medium orange brown, friable, medium to coarse grained, subangular to subrounded, poor to moderate sorted, clear, translucent and iron stained quartz, abundant medium to dark brown, very dispersive, silty, iron oxide rich matrix, non calcareous, trace dark brown soft lithics, trace dark green ? chamositic pellets, poor to fair visual porosity. With minor SILTSTONE, dark brown grey, soft, dispersive in part, carbonaceous in part, slightly calcareous, trace pyrite.

3.2.4 Sherbrook Group (960m to 1735m)

Paaratte Formation 960m to 1268m

SANDSTONE, quartzose, off-white, very light grey, loose, friable in part, medium to very coarse, dominantly medium grained with a finer grained component towards the base, subangular to subrounded, moderately sorted quartz, trace siliceous and pyritic cement, common white silty and argillaceous matrix in part, trace carbonaceous detritus, fair to good visual porosity, with minor CLAYSTONE, medium grey, soft, dispersive, trace to occasional carbonaceous detritus, very arenaceous in part, very minor COAL, black, dull, earthy, soft to firm in part, subblocky, and very rare DOLOMITE, buff, grey, hard, cryptocrystalline.

Skull Creek Mudstone Member 1268m to 1369m

CLAYSTONE, light to medium grey, dark brown grey medium to dark grey at base, very soft, puggy, slightly calcareous, micromicaceous, silty in part, very arenaceous with fine grained quartz, trace to common carbonaceous detritus and lithics, common microfossils. With common SANDSTONE, quartzose, off-white, friable, very fine to coarse, dominantly very fine to fine grained, subangular to subrounded, poor to moderate sorted quartz, siliceous cement, trace pyritic and calcareous cement, white argillaceous matrix in part, trace coally lithics, very poor visual porosity.

Nullawarre Greensand Member 1369m to 1580m

From 1369m to 1383m SANDSTONE, quartzose, medium green, green olive grey, friable, fine to coarse, dominantly medium grained, subangular to subrounded, moderately sorted, clear, light brown, light green quartz, patchy off white, medium green argillaceous and silty matrix, common dark green medium grained rounded ? chamosite pellets, fair to poor visual porosity.

From 1383 to 1580m SANDSTONE, quartzose, light to medium yellow brown, loose to friable, fine to medium grained, dominantly medium grained, subangular to subrounded, moderately sorted iron oxide stained quartz, weak siliceous cement in part, trace brown iron rich, dispersive argillaceous and silty matrix, common brown, medium grained, rounded iron oxide pellets, poor to fair visual porosity, with trace DOLOMITE, buff, cream, light grey, hard cryptocrystalline, and minor LIMONITIC CLAYSTONE, yellow brown, medium to dark brown, hard to moderately hard, brittle, very arenaceous with fine quartz and iron oxide pellets.

Belfast Mudstone 1580m to 1671m

CLAYSTONE, dark grey, firm, dispersive, micromicaceous, very carbonaceous, silty.

Flaxmans Formation 1608m to 1671m

CLAYSTONE, dark green, medium to dark green grey, dark grey black in part, soft to firm, dispersive in part, very arenaceous in part with abundant iron oxide and ? chamositic pellets and medium grained quartz, grades to a LITHIC SANDSTONE.

Waarre Sandstone 1671m to 1735m

SANDSTONE, quartzose, light to medium grey, light brown, off white, very fine to medium grained, dominantly fine grained, subangular to subrounded, moderate to well sorted quartz, common grey white argillaceous matrix, good calcite cement in part, trace to abundant carbonaceous detritus and laminae, fair to good visual porosity, with interbedded SILTSTONE, medium grey, medium grey brown, firm subfissile dispersive in part, slightly calcareous, micromicaceous, common carbonaceous detritus and laminae, arenaceous in part, and minor CLAYSTONE, dark grey, soft, dispersive, very carbonaceous, silty and arenaceous.

3.2.5 Otway Group (1735m to 1800m)

Eumeralla Formation 1735m to 1800m

SANDSTONE, lithic, green grey, off white, friable, fine to very coarse, dominantly medium grained, subangular, moderately sorted, clear and translucent quartz, abundant white argillaceous matrix, good calcite cement in part, trace pyrite cement in part, abundant dark green, medium grained, rounded ? chamositic lithics, common off white feldspathic lithics, poor visual porosity, with inter bedded SILTSTONE, medium green grey, medium to light grey, soft to firm, dispersive, slightly calcareous in part, trace to common carbonaceous detritus, very argillaceous and minor CLAYSTONE, light grey, very soft, brittle in part, dispersive, common silt and very fine quartz.

3.3 Hydrocarbon Indications

3.3.1 Mud Gas Readings

The mud gas detection equipment was operational from surface to total depth.

Levels of gas in the drilling mud from surface to approximately 1000m were below the detection capabilities of the system.

From 1000m to 1550m the background level of gas rose to a steady trace C_1.

From 1550m to 1800m (T.D.) background mud gas readings were relatively stable at 2 units C_1, 0.25 units C_2 and trace C_3.

The increase in mud gas over the basal portion of the hole probably relates to increased concentration and maturity of organics in the sediments drilled. Minor fluctuations of the total gas readings corresponds to the rate of penetration.

No significant anomalous mud gas readings were observed.

3.3.2 Sample Fluorescence

Cuttings samples were routinely inspected for oil fluorescence at 10 metre intervals from surface to 870m and at 5 metre intervals from 870m to 1800m (T.D.). All sidewall cores were also examined for oil fluorescence.

No oil fluorescence was observed in any of the cuttings or sidewall cores.

4. GEOLOGY

4.1 Structure

The Callista prospect was interpreted to be one of a series of Waarre Sandstone seismic amplitude anomalies observed within PEP 104 and PPL 1. Gas saturation was predicted by the seismic inversion method and the SAMPLE technique (Seismic Amplitude Measurement for Primary Lithology Estimation).

The Callista No. 1 well was located on the flank of a small "Base Upper Cretaceous" culmination in the Rowans Platform area (Figures 5 & 6.). As the seismic amplitude anomaly, originally interpreted to be at the Waarre Sandstone level, extends beyond structural closure it was thought to represent stratigraphic control to the gas accumulation. The well was optimally located with respect to the seismic anomaly rather than structural considerations.

The drill results show that the Waarre Sandstone is deeper in both time and depth than originally interpreted and is water saturated. The high amplitude event coincides with the interface between the Belfast Mudstone and the Flaxmans Formation and is a lithology effect rather than gas saturation related.

The obvious differences between the control point for the amplitude anomaly study (North Paaratte No. 1) and the Callista No. 1 well is the significantly greater thickness of the Flaxmans Formation and the poorer reservoir quality of the Waarre Sandstone in the subject exploration well.

Despite the disappointing results from the Callista No. 1 well, other amplitude anomalies in PEP 104 remain valid exploration targets in areas where the basal Upper Cretaceous lithologies are more similar to that of the successful North Paaratte No. 1 well.

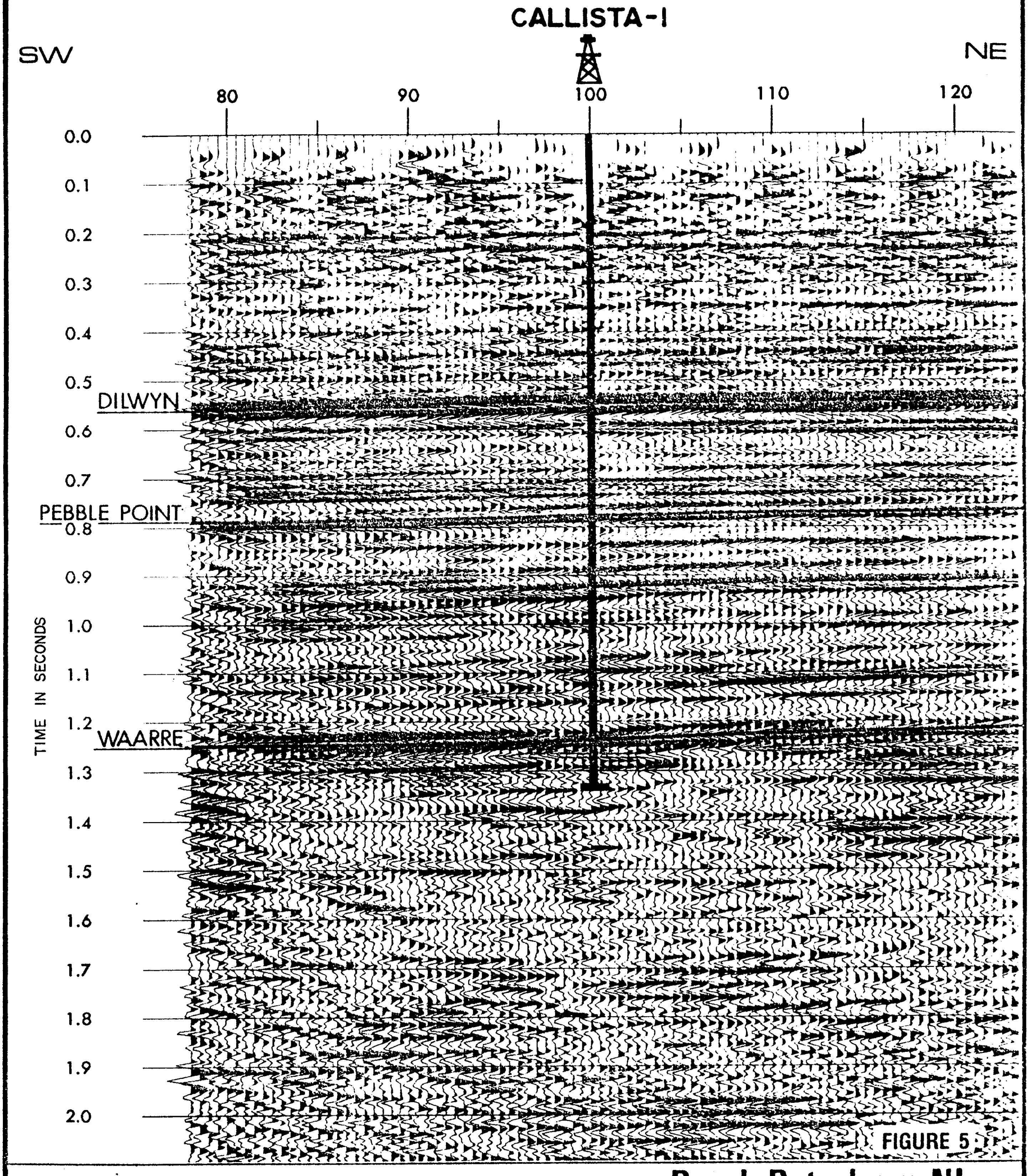


FIGURE 5

Beach Petroleum NL

PEP 104

CALLISTA-1

SEISMIC LINE MD-112
Migrated Stack
(Pre-Drill Interpretation)

AUTHOR: B. RAYNER DATE: OCTOBER 1988 DRAWN: LG

Drwg No. OT 4045 F

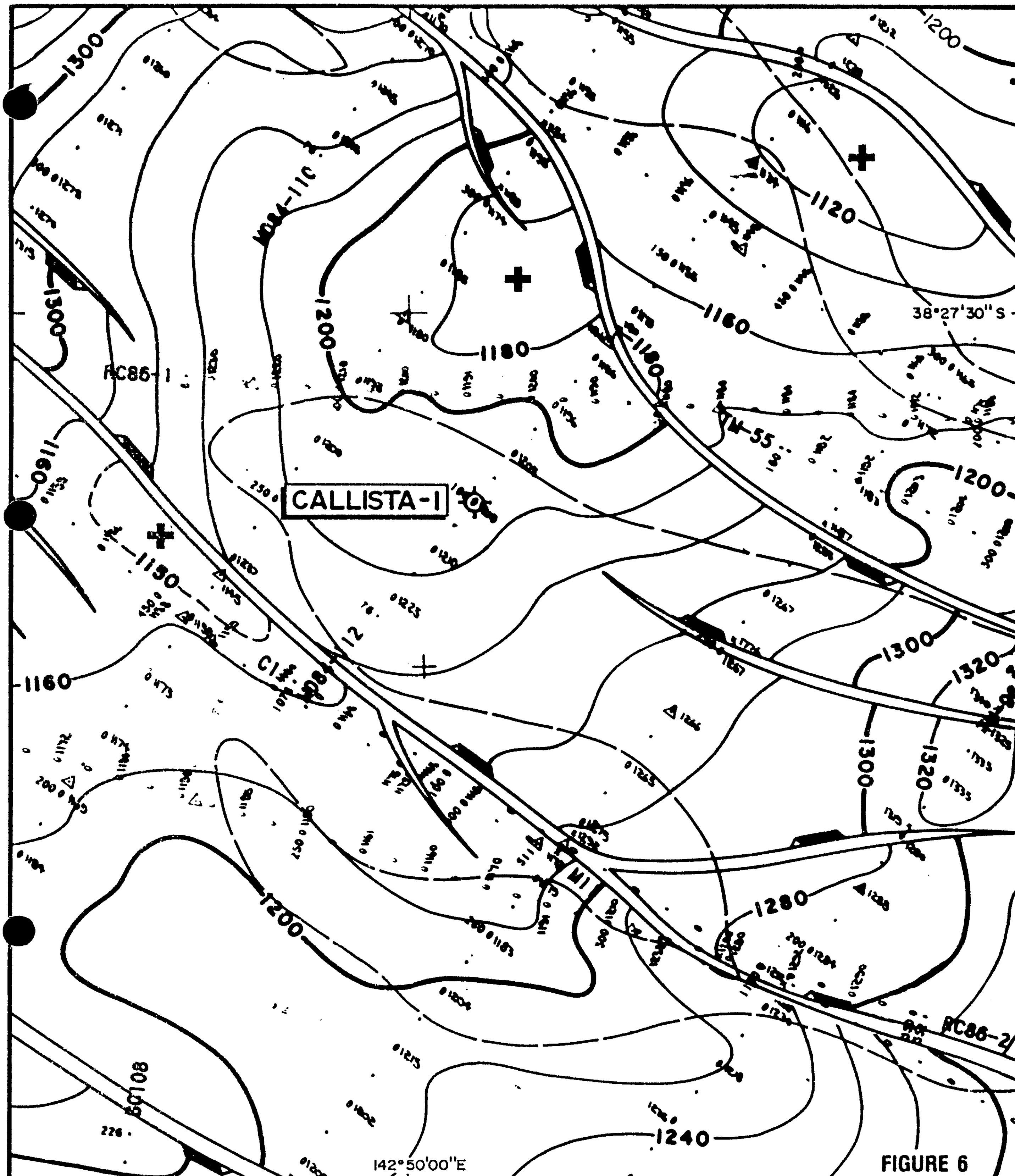


FIGURE 6

N

0 0·5 1
KILOMETRES

Beach Petroleum NL

PEP 104

CALLISTA-1

TOP WAARRE SANDSTONE TIME STRUCTURE MAP

(Pre-Drill Interpretation)

AUTHOR : P. SENYCIA   DATE : OCTOBER 1988   DRAWN : FROM OT 3766 R

4.2 Porosity and Water Saturation

Wireline log evaluation was facilitated by a Gearhart Well Evaluation Log.

No conventional cores were cut and no formation waters were recovered. All porosity and salinity values are therefore log derived.

No significant anomalous zones are inferred from the analysis of the ditch cuttings, the mud or the electric logs and all horizons appear to be water wet.

The Dilwyn Formation consists of a sequence of relatively clean, quartzose sandstones with interbedded claystones. The log derived porosity of these sandstones is in excess of 27%.

Within the Pebble Point Formation the better porosity is developed in the middle 15 metres of this interval. The top and base of the Pebble Point Formation are very argillaceous. The better porosity is of the 23-28% order with a Vclay of 0.25.

The Paaratte Formation sands are reasonably well developed with an average porosity of 26% and a Vclay of 0.15.

The Nullawarre Greensand Member was observed in the cuttings and sidewall cores to contain a dispersive silty to argillaceous matrix. This is not reflected in the wireline log response and the log estimates of less than 0.1 Vclay and an average of 25% porosity may be too optimistic.

The Waarre Sandstone contained a sequence of relatively argillaceous sandstones with interbedded claystones and siltstones. In the better sandstones, Vclay was between 0.1 and 0.4 and effective porosity between 10% and 22%. The best reservoir sandstone was observed at the top of the sequence.

4.3 Relevance to Occurrence of Hydrocarbons

Callista No. 1 was the first well to be drilled in the Otway Basin on the strength of direct hydrocarbon indications from the seismic.

The technique used was based on the nearby North Paaratte No. 1 well which discovered a thick, gas saturated Waarre Sandstone and shows a coincident seismic amplitude anomaly.

As the Callista feature was seen to have a very similar Waarre Sandstone seismic character to that of North Paaratte No. 1, it too was presumed to be gas filled.

Post-drill results show that the amplitude anomaly in the Callista No. 1 well is coincident with the Belfast Mudstone/Flaxmans Formation interface. In addition the Flaxmans Formation is relatively well developed and has obscured to a certain extent the seismic response of the poorly developed, underlying Waarre Sandstone. This is not the case in the North Paaratte field where the Flaxmans Formation is thin and has a relatively weak seismic response.

The problem with the Callista prognosis therefore lay in applying the North Paaratte No. 1 case as an analogy to an area with slightly different basal Upper Cretaceous lithologies.

Unless lithology and gas effects can be separated from the seismic response in PEP 104, then this exploration tool is only applicable to areas geologically similar to the North Paaratte No. 1 control point, i.e. thin/absent Flaxmans Formation together with a thick, well developed Waarre Sandstone.

The absence of hydrocarbons shows that no stratigraphic trapping of hydrocarbons has occurred at this feature and suggests that the well was either drilled too far down the flank of the structural feature to be within closure or that the fault closure was not an effective seal to migrating hydrocarbons.

APPENDIX 1

Details of Drilling Plant

RIG #2

SUPERIOR MODEL 700E SCR
CAPACITY 11,000FT, 3,350M NOMINAL

DRAWWORKS

ONE SUPERIOR MODEL 700E SCR ELECTRIC DRIVEN DRAWWORKS COMPLETE WITH AUXILIARY BRAKE AND SANDREEL. MAXIMUM INPUT H.P. 1000. DRIVEN BY EMD MOTOR.

ONE FOSTER MODEL 37 MAKE-UP SPINNING CATHEAD. MOUNTED ON DRILLERS SIDE.

ONE FOSTER MODEL 24 BREAK-OUT CATHEAD. MOUNTED OFF DRILLERS SIDE.

TRANSMISSION - 2 SPEED TRANSMISSION WITH HIGH CHAIN 1 1/4" TRIPLE 26T TO 24T. TWIN DISC PO218 AIR CLUTCH. LOW CHAIN 1 1/4" TRIPLE 20T TO 39T TWIN DISC PO218 AIR CLUTCH.

ENGINES

FOUR CATERPILLAR MODEL 3412 PCTA DIESEL ENGINES.

MAST

FLOOR MOUNTED CANTILEVER MAST DRECO - MODEL NO: M12713-510 DESIGNED IN ACCORDANCE WITH A.P.I. SPECIFICATION 4E 'DRILLING AND WELL SERVICING STRUCTURES'.

CLEAR WORKING HEIGHT - 127'
BASE WIDTH - 13' 6"
HOOK LOAD
GROSS NOMINAL CAPACITY - 510,000 LBS
HOOK LOAD CAPACITY WITH:

10 LINES STRUNG	*410,000 LBS*
8 LINES STRUNG	*365,000 LBS*
6 LINES STRUNG	*340,000 LBS*
4 LINES STRUNG	*306,000 LBS*

MAXIMUM WIND LOAD 100 MPH - NO SETBACK
MAXIMUM WIND LOAD 84 MPH - RATED SETBACK

ADJUSTABLE RACKING BOARD WITH CAPACITY FOR 108 STANDS OF 4 1/2" DRILL PIPE, 10 STANDS OF 6 1/2" DRILL COLLARS, 3 STANDS OF 8" DRILL COLLARS DESIGNED TO WITHSTAND AN A.P.I. WINDLOAD OF 84 MPH WITH PIPE RACKED.

CROWN BLOCK

215 TON WITH FIVE 36" SHEAVES, AND ONE 36" FASTLINE SHEAVE GROOVED 1 1/8".

SUBSTRUCTURE

ONE PIECE SUBSTRUCTURE. 14' H X 13' 6" W X 50' L W/ 12' BOP CLEARANCE.
SET-BACK - 200,000 LBS - CASING = 210,000 LBS.

RIG LIGHTING

EXPLOSION PROOF FLUORESCENT.

TRAVELLING BLOCK

ONE 667 CROSBY MCKISSICK 250 TONE COMBINATION BLOCK HOOK WEB WILSON 250 TON HYDRA - HOOK UNIT 5 - 36" SHEAVES.

KELLY DRIVE

ONE 20 HDP VARCO KELLY DRIVE BUSHING.

KELLY

ONE SQUARE KELLY DRIVE 4 1/4" X 40' COMPLETE WITH SCABBARD.

SWIVEL

ONE OILWELL PC-300 TON SWIVEL.

ROTARY TABLE

ONE OILWELL A 20 1/2" ROTARY TABLE TORQUE TUBE DRIVEN FROM DRAWWORKS.

AIR COMPRESSORS & RECEIVERS

TWO LEROI DRESSER MODEL 660A AIR COMPRESSOR PACKAGES C/W 10 H.P. MOTORS RATED AT 600 VOLT 60 HZ 3 PHASE. RECEIVERS EACH 120 GALLON CAPACITY AND FITTED WITH RELIEF VALVES.

INSTRUMENTATION

ONE (1) 6 PEN DRILL SENTRY RECORDER TO RECORD:
WEIGHT (D) 1-MARTIN DECKER SEALTITE
1-CAMERON DEADLINE TYPE
PENETRATION (FEET)
PUMP PRESSURE (0 - 6000 P.S.I.)
ELECTRIC ROTARY TORQUE
ROTARY SPEED (R.P.M.)
PUMP S.P.M. (WITH SELECTOR SWITCH)

INSTRUMENTATION
(Cont)

ONE (1) DRILLERS CONSOLE INCLUDING THE FOLLOWING EQUIPMENT:

MARTIN DECKER WEIGHT INDICATOR TYPE 'D' ELECTRIC ROTARY TORQUE GAUGE.
PIT SCAN.
S.P.M. GAUGE (2 PER CONSOLE).
ROTARY R.P.M. GAUGE.
ONE SET OF 'DOUBLE SHOT'
DEVIATION INSTRUMENT 'TOTCO'.
ONE SET OF MUD TESTING LABORATORY STANDARD KIT (BAROID).

DRILLING LINE

5000' OF 1 1/8" - TIGER BRAND.

MUD PUMPS

TWO GARDNER DENVER MUD PUMPS MODEL NO: PZHVE 750 EACH DRIVEN BY 800 HP EMD MOTOR.

GENERATOR

FOUR BROWN BOVERI 600 VOLT 3 PHASE 60 HZ AC GENERATORS. POWERED BY FOUR CAT 3412 PCTA DIESEL ENGINES.

B.O.P'S AND
ACCUMULATOR

ONE HYDRIL 13 5/8" X 3000 P.S.I. SPHERICAL ANNULAR B.O.P.,STUDDED TOP AND FLANGED BOTTOM. HEIGHT 14"
ONE HYDRIL 13 5/8" X 5000 P.S.I. FLANGED DOUBLE GATE B.O.P.
ONE GALAXIE 13 5/8" X 5000 P.S.I. 3000 DOUBLE STUDDED ADAPTOR FLANGES COMPLETE WITH STUDS AND NUTS.
ONE CUP TESTER. GRAY C/W TEST CUPS FOR 9-5/8" AND 13-3/8"
ONE WAGNER MODEL 130 - 160 3 BND 160 GALLON ACCUMULATOR CONSISTING OF:

SIXTEEN 11 GALLON BLADDER TYPE BOTTLES.
ONE 20 H.P. ELECTRIC DRIVEN TRIPLEX PUMP 600 VOLT 60 HZ 3 PHASE MOTOR AND CONTROLS.
ONE WAGNER MODEL A - 60 AUXILIARY AIR PUMP 4.5 GALS/MINUTE.
ONE WAGNER MODEL UM2SCB5S MOUNTED HYDRAULIC CONTROL PANEL WITH FIVE (5) 1" STAINLESS STEEL FITTED SELECTOR VALVES AND TWO (2) STRIPPING CONTROLS AND PRESSURE REDUCING VALVES. THREE (3) 4" HYDRAULIC READOUT GAUGES:

- ONE FOR ANNULAR PRESSURE
- ONE FOR ACCUMULATOR PRESSURE
- ONE FOR MANIFOLD PRESSURE

ONE WAGNER MODEL GMSB - 5A 5 STATION REMOTE DRILLERS CONTROL WITH THREE PRESSURE READBACK GAUGES, INCREASE AND DECREASE CONTROL FOR ANNULAR PRESSURE.

SPOOLS

ONE SET FLANGED ADAPTOR SPOOLS TO MATE 13 5/8" LOT X 5000 P.S.I. A.P.I. B.O.P. FLANGE TO FOLLOWING WELLHEAD FLANGES:

12" X 900 SERIES, HEIGHT 14"
10" X 900 SERIES " "
8" X 900 SERIES " "
B.O.P. SPACER. FLANGE 12" 3000 R57 STUDDED X 6" 3000 R45 FLANGE, HEIGHT 16"
B.O.P. SPACER SPOOL (DRILLING SPOOL) 12" 5000 X 12" 5000 BX160, HEIGHT 14"

KELLY COCKS

ONE GRIFFITH LOWER KELLY COCK 6 1/2" O.D. WITH 4 1/2" X H CONNECTIONS.
ONE GRIFFITH UPPER KELLY COCK 7 3/4" WITH 6 5/8" A.P.I. CONNECTIONS.

DRILL PIPE SAFETY VALVE

ONE GRIFFITH 6 1/2" INSIDE BLOWOUT PREVENTORS (4 1/2" X H)
ONE GRIFFITH 6 1/2" STABBING VALVE (4 1/2" X H)

CHOKE MANIFOLD

ONE MCEVOY CHOKE AND KILL MANIFOLD 3" - 5000 P.S.I.

MUD SYSTEM

ONE PILL TANK CAPACITY 25 BBLS.
TWO MIX TANKS CAPACITY 108 BBLS. (EACH)
ONE RESERVE TANK CAPACITY 120 BBLS.
ONE DESILT TANK CAPACITY 120 BBLS.
ONE DESAND TANK CAPACITY 120 BBLS.
ONE SHAKER TANK CAPACITY 130 BBLS.
ONE SAND TRAP CAPACITY 15 BBLS.

FUEL TANKS

ONE 140 BBLS.
ONE 6000 GALS - 30,000 LITRES.

WATER TANKS

ONE 400 BBLS

MIXING PUMPS

FIVE MISSION MAGNUM 5" X 6" X 14" CENTRIFUGAL PUMPS COMPLETE WITH 50 H.P. 600 VOLT HZ 3 PH EXPLOSION PROOF ELECTRIC MOTORS.

TRIP TANK PUMP

ONE MISSION MAGNUM 2" X 3" CENTRIFUGAL PUMP COMPLETE WITH 20 H.P. 600 VOLT 60 HZ 3 PH EXPLOSION PROOF MOTORS.

WATER TRANSFER PUMPS

THREE MISSION MAGNUM 2" X 3" CENTRIFUGAL PUMPS C/W 20 H.P. 600 VOLT 60 HZ 3 PH EXPLOSION PROOF MOTORS.

MUD AGITATORS

SIX GEOLOGRAPH/PIONEER 40 TD - 15" 'PITBULL' MUD AGITATORS WITH 15 H.P. 600 VOLT 60 HZ 3 PH ELECTRIC MOTORS.

SHALE SHAKER

ONE BRANDT - DUAL TANDEM SHALE SHAKER.

DESANDER

ONE PIONEER T8-6 'SANDMASTER' DESANDER.

DESILTER

ONE PIONEER T12-4 'SILTMASTER' DESILTER.

DRILL PIPE

10000 FT OF 4 1/2" GRADE 'E' 16.60 LBS/FT HARD BANDED DRILL PIPE 326 JOINTS.

DRILL COLLARS

1 - 6 1/2" OD DRILL COLLAR (SHORT) 15'
27 - 6 1/2" OD DRILL COLLARS.
3 ACTUAL 8" OD DRILL COLLARS.
9 ACTUAL JOINTS OF 4 1/2" HEVI-WATE DRILL PIPE.

TWO (2) BIT SUBS - 6-5/8" REG DBL BOX
TWO (2) BIT SUBS - 4-1/2" REG X 4-1/2" XH DBL BOX
ONE (1) XO SUB - 7-5/8" REG X 6-5/8" REG DBL BOX
ONE (1) XO SUB - 4-1/2" XH BOX X 4-1/2" IF PIN
ONE (1) XO SUB - 4-1/2" REG X 4-1/2" XH DBL PIN
TWO (2) XO SUB - 6-5/8" REG PIN X 4-1/2" XH BOX
ONE (1) JUNK SUB - 6-5/8" REG PIN X 6-5/8" REG BOX
ONE (1) JUNK SUB - 4-1/2" REG BOX X 4-1/2" REG PIN
ONE (1) JUNK SUB - 4-1/2" REG BOX X 4-1/2" XH BOX
TWO (2) KELLY SAVER SUB S/W RUBBER 4-1/2" XH PXB
TWO (2) CIRCULAR SUBS - 4-1/2" XH X 1502 HAMMR UNION
TWO (2) 12-1/4" EZI CHANGE S/STAB 6-5/8 REG PXB
TWO (2) 8-1/2" INTEGRAL BLADE STABILIZERS 4-1/2" XH PXB

ELEVATORS

ONE (1) 4-1/2" BJ 250 TON 18 DEGREE TAPER D/P ELEVATORS
ONE (1) 2-7/8" IUS 100 TON TUBING ELEVATORS
ONE (1) 2-7/8" EUI 100 TON TUBING ELEVATORS
ONE (1) 13-3/8" BAASH ROSS 150 TON S/DOOR ELEVATORS
ONE (1) 13-3/8" S/JOINT P.U. ELEVATORS
ONE (1) 9-5/8" WEBB WILSON 150 TON S/DOOR ELEVATORS
ONE (1) 9-5/8" S/JOINT P.U. ELEVATORS
ONE (1) 7" BJ 200 TON S/DOOR ELEVATORS
ONE (1) 7" S/JOINT P.U. ELEVATORS
ALL P.U. ELEVATORS C/W SLINGS & SWIVEL

ONE (1) 8" WEBB WILSON 150 TON S/DOOR ELEVATORS D/C
ONE (1) 5-3/4" WEBB WILSON 150 TON S/DOOR ELEVATORS D/C
ABOVE C/W LIFT NUBBING AND BAILS

ROTARY SLIPS D/P TUBING

TWO (2) 4-1/2" VARCO SDML D/P SLIPS
ONE (1) 3-1/2" VARCO SDML TUBING SLIPS
TWO (2) 8" - 6-1/2" DCS-R DRILL COLLAR SLLIPS

ROTARY TONGS

ONE (1) BJ TYPE 'B' C/W LATCH & LUG JAWS 13-3/8" - 3-1/2"

CASING SLIPS

THREE (3) 13-3/8" - 9-5/8" - 7" VARCO CSML CASING SLIPS

BIT BREAKERS

FOUR (4) 17-1/2" - 12-1/4" - 8-1/2" - 6"

FISHING TOOLS

ONE (1) 8-1/8" BOWEN SERIES 150 F.S. O/SHOT
ONE (1) 10-5/8" BOWEN SERIES 150 F.S. O/SHOT
C/W GRAPPLES & PACKOFFS TO FISH CONTRACTORS DOWN HOLE EQUIPMENT.
ONE (1) 8 O.D. FISHING MAGNET 4-1/2" REG PIN
ONE (1) REVERSE CIRC JUNK BASKET 4-1/2" XH BOX
ONE (1) JUNK BASKET MILL TYPE C/W MILL SHOE 4-1/2" REG PIN
ONE (1) JARS 6-1/2" O.D. GRIFFITHS FISHING 4-1/2" XH PXB
ONE (1) JAR ACCELERATOR GRIFFITHS FISHING 6-1/2" O.D. 4-1/2" XH PXB
ONE (1) BUMPER SUB 6-1/2" O.D. FISHING 4-1/2" XH PXB
ONE (1) 12" JUNK MILL - 6-5/8" REG PIN
ONE (1) 8" JUNK MILL 4-1/2" REG PIN

ROTARY REAMERS

ONE (1) 6-1/2" O.D. DRILCO N.B. ROLLER REAMER C/W TYPE K CUTTERS 8-1/2" HOLE

PUP JOINTS

THREE (3) 5' - 10; - 15; 4-1/2" O.D. GRADE 'G' PUP JOINTS

AUGER

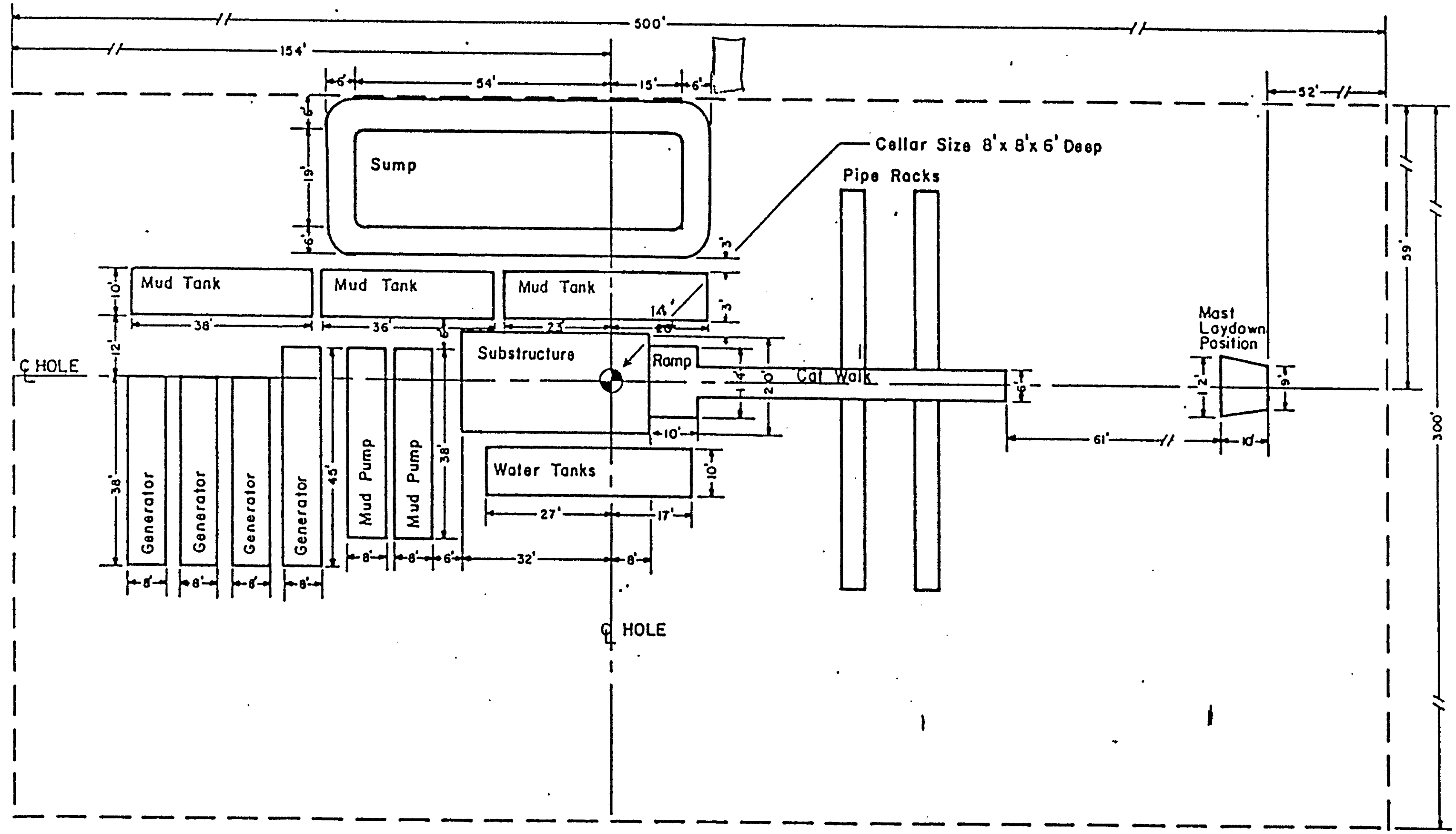
ONE (1) 27-1/2" AUGER 4-1/2" XH BOX

RATHOLE DIGGER

ONE (1) FABRICATED ROTARY TABLE CHAIN DRIVEN

POWER TONG

ONE (1) FARR 13-5/8" - 5-1/2" HYDRAULIC POWER TONS
C/W HYD. POWER PACK & HOSES & TORQUE GUAGE ASSY



Scale: 1" = 30'

Location Size: 300' x 500'

Drilling Services
Rig No. 2

GEARHAR
DRILLING SERVICE

APPENDIX 2

Summary of Wellsite Operations

SUMMARY OF DRILLING OPERATIONS

The Callista No. 1 drill site was prepared by Mr. R. Andrew of Timboon.

Prior to the rig arriving a 16" conductor pipe had been installed to 9.0m.

The G.D.S.A. Rig 2 was rigged up and Callista No. 1 was spudded at 1200 HRS, 27th March, 1988.

A 12¼" hole was drilled to 302m where the 9 5/8" casing was set.

The B.O.P.'s were installed and all functions tested to 1500 p.s.i.

Drilling resumed with 8½" hole to 308m at which point a leak-off test established a formation integrity of 14.2 ppg.

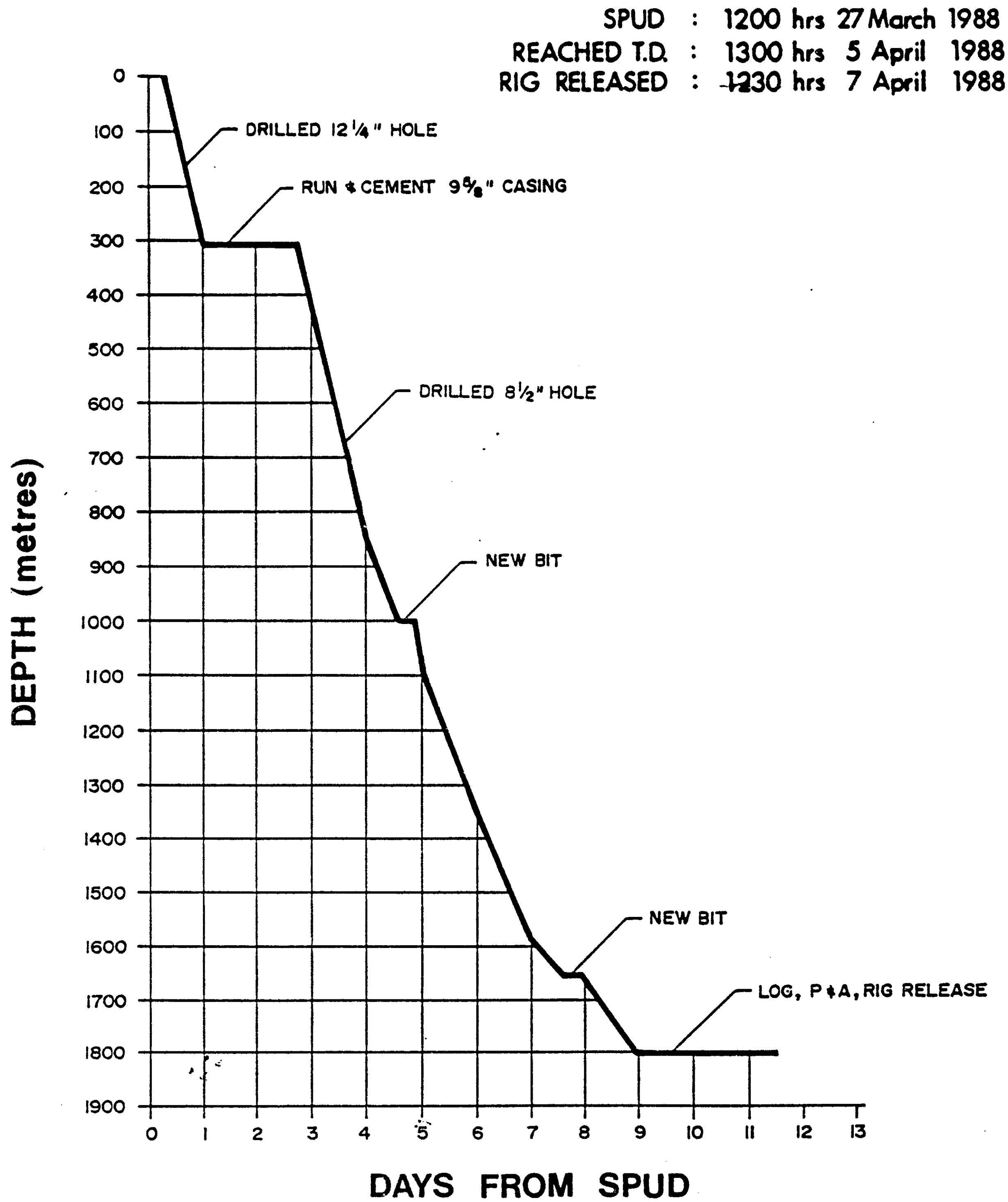
The 8½" hole was continued to total depth with bit changes at 1001m and 1655m.

Total depth of 1800m was reached at 1300 HRS, 5th April, 1988.

Gearhart Australia then ran the following log; DLL/MSFL/GR, BCS/GR, SLD/CNS/GR, CIS and SWC.

Cement plugs were then set over the interval 1690-1640m, 1380-1330m, 950-900m, 310-255m and at the surface.

The rig was released out 1230 HRS, 7th April, 1988.



Beach Petroleum NL

PEL 28

CALLISTA -1

TIME VS DEPTH

AUTHOR: B.L. RAYNER DATE: OCT 1988 DRAWN BY: VT

APPENDIX 3

Drilling Fluid Recap

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

OPERATOR: BEACH PETROLEUM N.L. WELLSITE REP: V. SANTOSTEFANO

CONTRACTOR: GEARHART DRILLING CONTRACTOR REP: G. NICOT

RIG: #2

WELL: CALLISTA #1

TOTAL DRILLING DAYS: 10 SPUD DATE: 27.3.88

TOTAL DAYS ON WELL: 11 TOTAL DEPTH DATE: 5.4.88

DRILLING FLUID BY INTERVAL:		MUD COST BY INTERVAL:
SPUD MUD.....	.....0..to..302 METRES	....$..1334.44.......
....	...302..to.1800 METRES	....$..7328.60.......
....	........to........	....
....	........to........	....
TOTAL MUD COST:		....$..8663.04.......

DRESSER MAGCOBAR ENGINEERS: M. OLEJNICZAK.

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

INTRODUCTION

WELL SUMMARY

INTRODUCTION

Callista #1 had a very similar prognosed lithology to the Iona #1 well which had been drilled immediately before it. As the use of a Frestwater-Bentonite-Polymer mud in conjunction with low hydraulics had resulted in a very good guage hole, at the expense of some tight hole problems, it was planned to follow the same procedure on Callista #1.

With a deeper T.D. of 1750 metres expected, the total mud cost was anticipated at being in the $9,000 to $11,000 range.

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

BEACH PETROLEUM N.L. - CALLISTA #1

FORMATION TOPS

PORT CAMPBELL LST	SURFACE
GELLIBRAND MARL	177 METRES
CLIFTON FORMATION	486 METRES
NARRAWATURK FORMATION	502 METRES
MEPUNGA FORMATION	546 METRES
DILWYN FORMATION	630 METRES
PEMBER MUDSTONE	863 METRES
PEBBLE POINT FORMATION	909 METRES
PARAATE FORMATION	960 METRES
SKULL CREEK MUDSTONE	1268 METRES
NULLAWARRE GREENSAND	1369 METRES
BELFAST MUDSTONE	1580 METRES
FLAXMAN'S FORMATION	1608 METRES
WARRE FORMATION	1671 METRES
EUMERALLA FORMATION	1735 METRES
T.D.	1800 METRES

M-I Australia Pty. Ltd.
Magcobar/IMCO
A Dresser/Halliburton Company

WELL SUMMARY

MUD SUMMARY BY INTERVAL

OBSERVATIONS AND RECOMMENDATIONS

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

MUD SUMMARY BY INTERVAL

OBSERVATIONS AND RECOMMENDATIONS

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

SUMMARY BY INTERVAL

INTERVAL: 0-302 METRES 12 1/4" HOLE 9 5/8" CASING

From the digging of the conductor hole it had been observed that the Port Campbell Limestone and the water table were about 4 metres from surface. To minimise chances of hole washout around the conductor, or loss circulation, the well was spudded in with Lime flocculated Bentonite spud mud of 45 seconds funnel viscosity.

There appeared to be a partial mud loss, amounting to about 50 bbls during the drilling of the first three singles through soft porous Limestone immediately beneath the conductor.

Drilling then continued with apparently full returns, with prehydrated Kwik-Thik, and Lime being added to maintain a Lime flocculated Bentonite mud of 34-36 seconds viscosity, and an 18 lb/100 sq ft yield point. There was very little native clay in the section to aid viscosity, but Bentonite additons were minimised, as the top of the Gellibrand Marl was anticipated at about 190 metres. Cuttings returns at the shakers with the relatively low viscosity but high yield point mud were reasonably consistent and cleared up quickly during circulation suggesting a reasonably guage hole with the mud having sufficient cuttings carrying capicity.

The top of the Gellibrand Marl was reached at 177 metres, with drilling stopped at 190 metres for half an hour due to partial lost circulation of about 200 bbl. Apparently the annulus had loaded up with excessive cuttings from the Marl, probably resulting in partial mud loss below the conductor shoe. As it was anticipated this would heal itself with reduced weight in the annulus with the native clay being drilled, the mud was watered back, and the pump rate cut back from 460 gpm to 310 gpm. Drilling continued with full circulation, and the pump rate was gradually increased back to 460 gpm. Viscosity was controlled to about 36 seconds with mud weight maintained at 8.9 ppg with water dilution to minimise the chance of a mud ring forming.

At the 302 metres casing point, a wiper trip was run without problems, with a Lime flocculated hi-viscosity sweep pumped around. The 9 5/8" casing was then run in and cemented to 299 metres, with cement returning to the surface after 30 bbl of displacement, indicating the hole had been in reasonably good guage.

WELL SUMMARY

INTERVAL: 302-1800 METRES 8 1/2" HOLE

As almost another 200 metres of Gellibrand Marl was anticipated below the 9 5/8" casing shoe, the surface mud was diluted with water by dumping and cleaning out the sandtrap, degasser, and desander tanks.

After nippling up was completed the cement and casing shoe plus an additional 6 meters of new hole to 308 metres was drilled out with predominantly water. A leak off test was run giving a 14.2 ppg equivilent at 308 metres.

Drilling then continued steadily through the Gellibrand Marl, with a small amount (1-1 1/2% by weight) of Potassium Chloride added. This was done to improve clay inhibition just sufficiently to give good cuttings at the shakers, and drastically reduce dilution rates, thus saving on water consumption. At the time water consumption was actually of some concern, as the turkey's nest did not appear to be holding water properly. Initially the pumps were run at 260 gpm in the 8 1/2" hole but with some hydraulicking of the kelly on early connections due to apparent tight hole, this was increased to 285 gpm and connections improved. With residual cement contamination retained in the mud through most of the Marl for increased inhibition, Bicarbonate was added and the Potassium Chloride allowed to drop off towards the end of the Marl. This was to allow the native clay content to increase, prior to entering the Dilwyn Sands. Mud weight rose only to 8.8 ppg with viscosity controlled between 33-35 seconds through the Marl, and no problems were experienced.

With the top of the Dilwyn Sand formation at 630 metres, the pump rate was decreased to 215 pgm, with a corresponding nozzle velocity of 248 ft/sec, and impact force of 240-250 lb. The drill rate still improved in the looser sands and hole cleaning was quite adequate with the flocculated Bentonite mud with yield points of 20-30 lb/100 sq ft. Sand returns at the shakers were steady and not excessive with the B40/B60 mesh screens giving no real problems, indicating the hole was not washing out badly. Bentonite additions were minimised with only a small amount of prehydrated Kwik Thik added through this section to bring the viscosity up to 38 seconds. This was both to minimise costs, and also to allow for additional Polymers and Bentonite to be added later on towards the bottom of the Dilwyn formation to reduce the filtration control while drilling through the Pember Mudstone. In this way the mud was gradually converted from a flocculated Bentonite mud with no water loss control, to a deflocculated Freshwater-Bentonite-Polymer mud with a filtrate of

9 cc's by the time the Pebble Point formation was reached at 909 metres, using Bicarbonate, CMC EHV, Polysal and additional Kwik Thik.

After circulating out the drilling break at 913 metres, drilling continued to 1001 metres, through the top of the Paraate formation at 960 metres, before tripping for a bit change. With a stabiliser and jars added to the bottom hole assembly, it was necessary to ream back in from 746 metres to bottom. This suggested that the hole must have been in reasonably good guage through this interval.

While continuing drilling through the Paraate formation, the mud was maintained with additions of prehydrated Kwik Thik and CMC EHV to maintain rheology, but only control the filtrate to about 12 cc's. With the desilter out of order for most of the rest of the well it was necessary to begin regular dumping of the sandtrap together with increased dilution and finer shaker screens to control the mud weight at 9.3 ppg. A 7 stand wiper trip at 1211 metres had tight hole from 1200 metres to 1000 metres requiring working with the kelly. On running back in, the mud was hydraulicking up the string indicating packing off around the bottom hole assembly, so the mud was circulated for half an hour, before being able to run back in and resume drilling.

In the Skull Creek Mudstone from 1268 metres the samples became very, very sticky with the dumping and dilution rate having to be increased to control the mud weight to 9.3 ppg. Mud properties were being stablised with the viscosity at 44-46 seconds and filtration control reduced to 8 ccs, with a yield point of 12-14 lb/100 sq ft.

After circulating out a drilling break in the top of the Nullawarre Greensand at 1372 metres, another wiper trip was made at 1398 metres. Again it was necessary to work tight hole up to 1151 metres with the kelly, but it was possible to run back in satisfactorily. Then drilling continued steadily through the Nullawarre Greensand, maintaining the same consistent mud properties with additions of premixed Bentonite, CMC EHV and Polysal with the filtration control steadily reduced to around 6.5 ccs. The top of the Belfast Mudstone was reached at 1580 metres, but there wasn't much thickness of true mudstone with the Flaxman's formation coming in at 1608 metres, and the drilling break circulated out at 1613 metres.

Another wiper trip was made at 1627 metres, with tight hole requiring working with the kelly up to 1426 metres, but running back in without problems. At the time, it was hoped that with the last of the very sticky mudstones having been drilled, trips would improve, and this did occur. At 1655 metres a trip for a bit change was made, still in the Flaxman's formation, as the main target, the Warre Sandstone, was much deeper than predicted. This complete round trip was very good, with no significant tight hole, only requiring 3 singles to be reamed to bottom, as the old bit had been slightly underguage.

The major target, the Warre Sandstone, was then reached at 1671 metres, with drilling breaks circulated out at 1674 metres, 1680 metres and 1700 metres but with no shows, so drilling continued on with the Eumeralla formation being reached at 1735 metres, to T.D. at 1800 metres.

A ten stand wiper trip was run with tight hole from 1637 metres to 1551 metres, so reamed back in from 1579 metres to 1687 metres, to ease the problem. After circulating out again, pulled out to run Gearhart wireline logs, with no significant tight hole.

The logs were then run for 14 1/2 hours with no hole problems, with the logger's T.D. being exactly the same at 1800 metres. The caliper log showed the hole to be in very good guage overall with a degree of washout above 600 metres at around a 10" average, but excellent guage below that to T.D.

After completing logging, the well was plugged and abandoned.

CONCLUSION AND SUMMARY

Callista #1 was spudded in on 27th March, 1988 and drilled with a Freshwater-Bentonite-Polymer mud, reaching it's 1800 metres T.D. on 5th April. Following wireline logging, it was then plugged and abandoned as a dry hole on 6th April, 1988.

No significant mud problems were experienced at all, with the final mud bill reaching $8663.04 which included some damaged stock, and materials used for cementing. The actual mud consumption for drilling would have been close to $8000.00. This can be considered as quite a low cost for this well, with the short duration of the well helping to keep maintainence costs down.

Tight hole problems were experienced again, as on Iona #1, and could be related to the drilling of the major mudstone/siltstone sequences. It appeared that sticky clay would build up around the bottom hole assembly while pulling back through the recently drilled mudstone or siltstone and then become tight in the near guage hole being drilled. With time and periodic wiper trips to clean off the side of the hole the problem decreased, so that by T.D. the wireline logging runs had no problems at all, with the hole showing good stability.

As on Iona #1, the 8 1/2" hole was in very good guage, particularly below 600 metres where the pump rate was reduced from 285 gpm. The extra washout above 600 metres serves to highlight the susceptibility of these formations to hydraulic erosion. For this reason it is still recommended to maintain low nozzle velocity of around 250 ft/sec on these wells through formations of interest.

The use of a small amount of KCl while drilling through the Gellibrand Marl, to give a 1-1 1/2% by wt solution is recommended to be repeated in future. For a small cost, which is fairly insignificant by the end of the well, it virtually eliminated chances of a mud ring, gives much better cuttings for samples, greatly reduces water consumption, and consequently results in much less filling up of the sump.

Overall the results on the Iona #1 and Callista #1 wells show definately that a Freshwater-Bentonite-Polymer mud in conjunction with low hydraulics can produce a good hole. Through the upper cretacious and tertiary Otway Basin sequences. The only problems experienced being some tight hole on trips, and sticky mudstone cuttings through the Skull Creek, Belfast Mudstones and the top of the Eumeralla formation. The use of a KCl mud most likely would not improve the tight hole situation very much, if at all, from past experiences with close to guage holes. Mudstone/siltstone samples would be improved, and if this is considered as a strong enough priority, then a KCl mud should be used, for this reason alone.

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

MUD CONSUMPTION BY INTERVAL

TOTAL MATERIAL CONSUMPTION

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

OPERATOR: BEACH PETROLEUM WELL: CALLISTA #1

HOLE SIZE..12 1/4"...

INTERVAL..SURFACE - 302 METRES CASING SIZE..9 5/8"....
(at 299 metres)

PRODUCT	QUANTITY	COST
MAGCOGEL	12 x 100 lb sx	$ 195.12
KWIK THIK	90 x 25 kg sx	$ 972.00
CAUSTIC SODA	5 x 25 kg sx	$ 113.75
LIME	5 x 25 kg sx	$ 23.75
POTASSIUM CHLORIDE	2 x 50 kg sx	$ 29.82
	TOTAL INTERVAL COST :	$ 1334.44

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

OPERATOR: BEACH PETROLEUM WELL: CALLISTA #1

HOLE SIZE...8 1/2"...

INTERVAL....302 - 1800 METRES CASING SIZE...-......

PRODUCT	QUANTITY	COST
BARITE	47 x 50 kg sx	$ 314.90
MAGCOGEL	42 x 100 lb sx	$ 682.92
KWIK THIK	72 x 25 kg sx	$ 777.60
CAUSTIC SODA	16 x 25 kg sx	$ 364.00
LIME	7 x 25 kg sx	$ 33.25
S. BICARBONATE	5 x 40 kg sx	$ 84.90
POTASSIUM CHLORIDE	36 x 50 kg sx	$ 536.76
CMC EHV	26 x 25 kg sx	$ 1392.82
MAGCOPOLYSAL	61 x 25 kg sx	$ 2363.75
D.I. - CIDE	4 x 25 lt drum	$ 148.20
PIPE LAX	1 x 205 lt drum	$ 587.50
CALCIUM CHLORIDE	3 x 25 kg sx	$ 42.00
	TOTAL INTERVAL COST :	$ 7328.60

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

TOTAL MATERIAL CONSUMPTION

OPERATOR: BEACH PETROLEUM

WELL: CALLISTA #1

LOCATION: OTWAY BASIN, VICTORIA

PRODUCT	UNIT	COST	%
BARITE	47 x 50 kg sx	$ 314.90	3.63
MAGCOGEL	54 x 100 lb sx	$ 878.04	10.14
KWIK THIK	162 x 25 kg sx	$ 1749.60	20.20
CAUSTIC SODA	21 x 25 kg sx	$ 477.75	5.50
LIME	12 x 25 kg sx	$ 57.00	0.66
BICARBONATE	5 x 40 kg sx	$ 84.90	0.98
POTASSIUM CHLORIDE	38 x 50 kg sx	$ 566.58	6.54
CMC EHV	26 x 25 kg sx	$ 1392.82	16.08
MAGCOPOLYSAL	61 x 25 kg sx	$ 2363.75	27.29
D.I. - CIDE	4 x 25 lt drum	$ 148.20	1.71
PIPE LAX	1 x 205 lt drum	$ 587.50	6.78
CALCIUM CHLORIDE	3 x 25 kg sx	$ 42.00	0.49
	TOTAL MATERIAL COST :	$ 8663.04	100.00

M-I Australia Pty. Ltd.

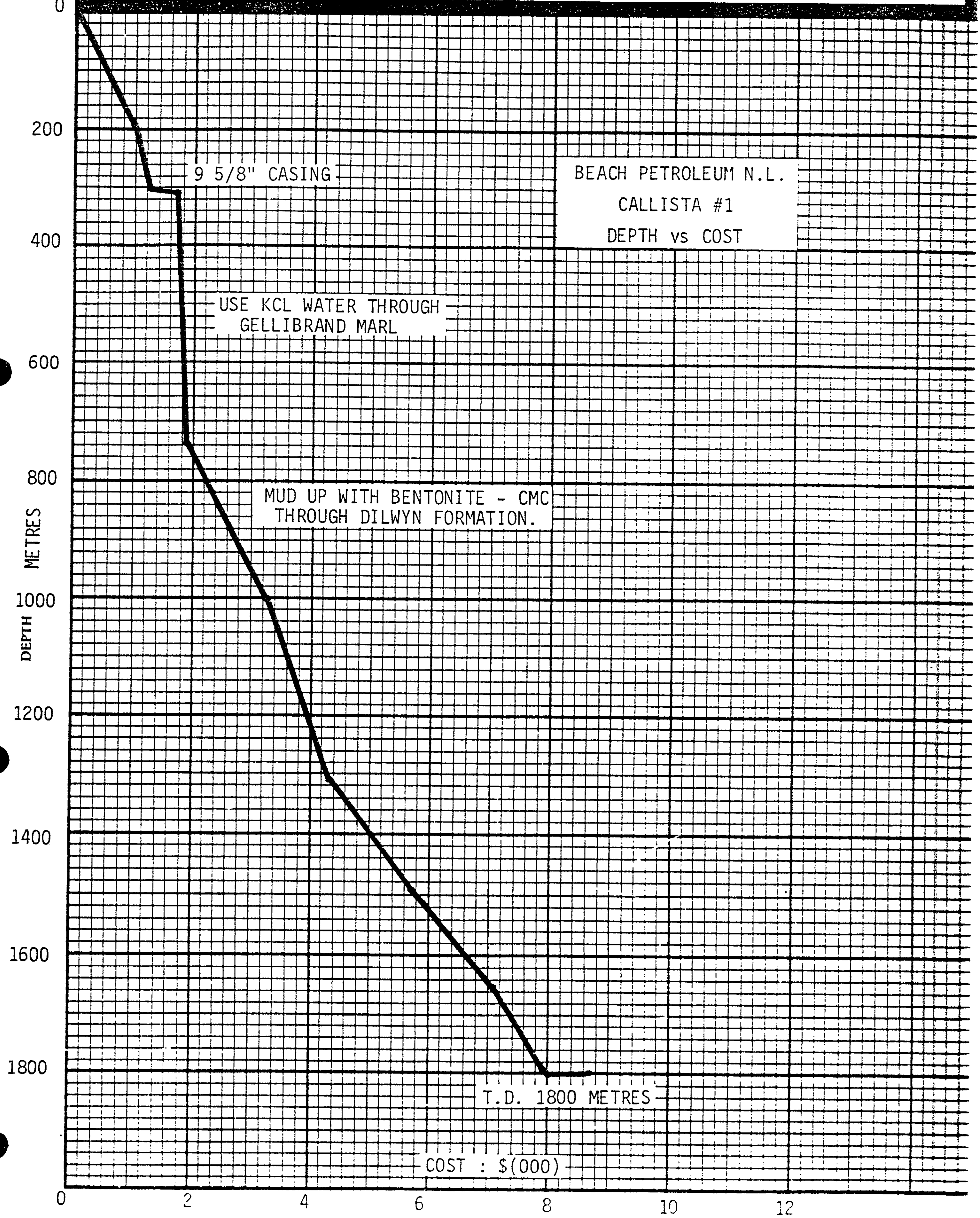
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

GRAPHS

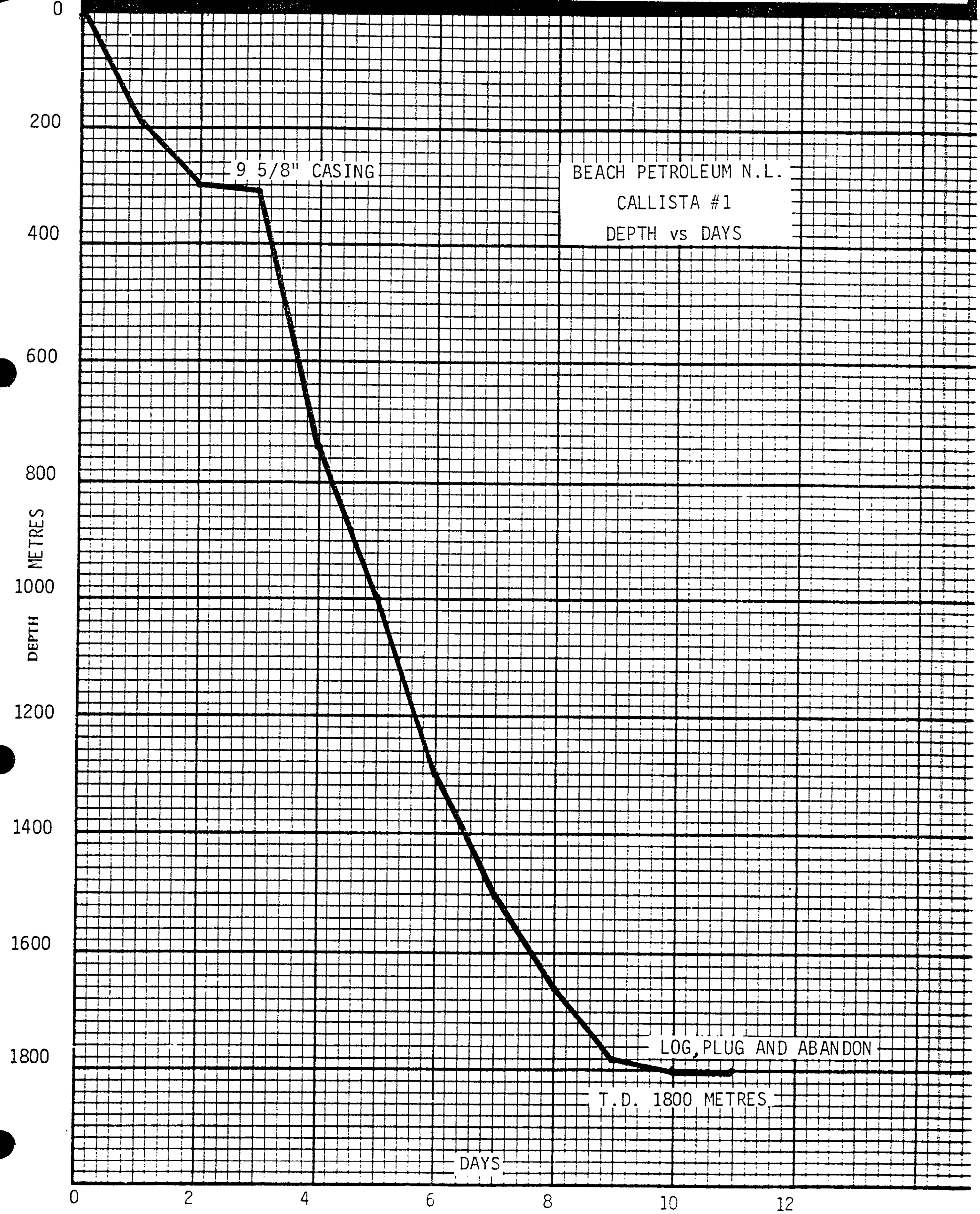
M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

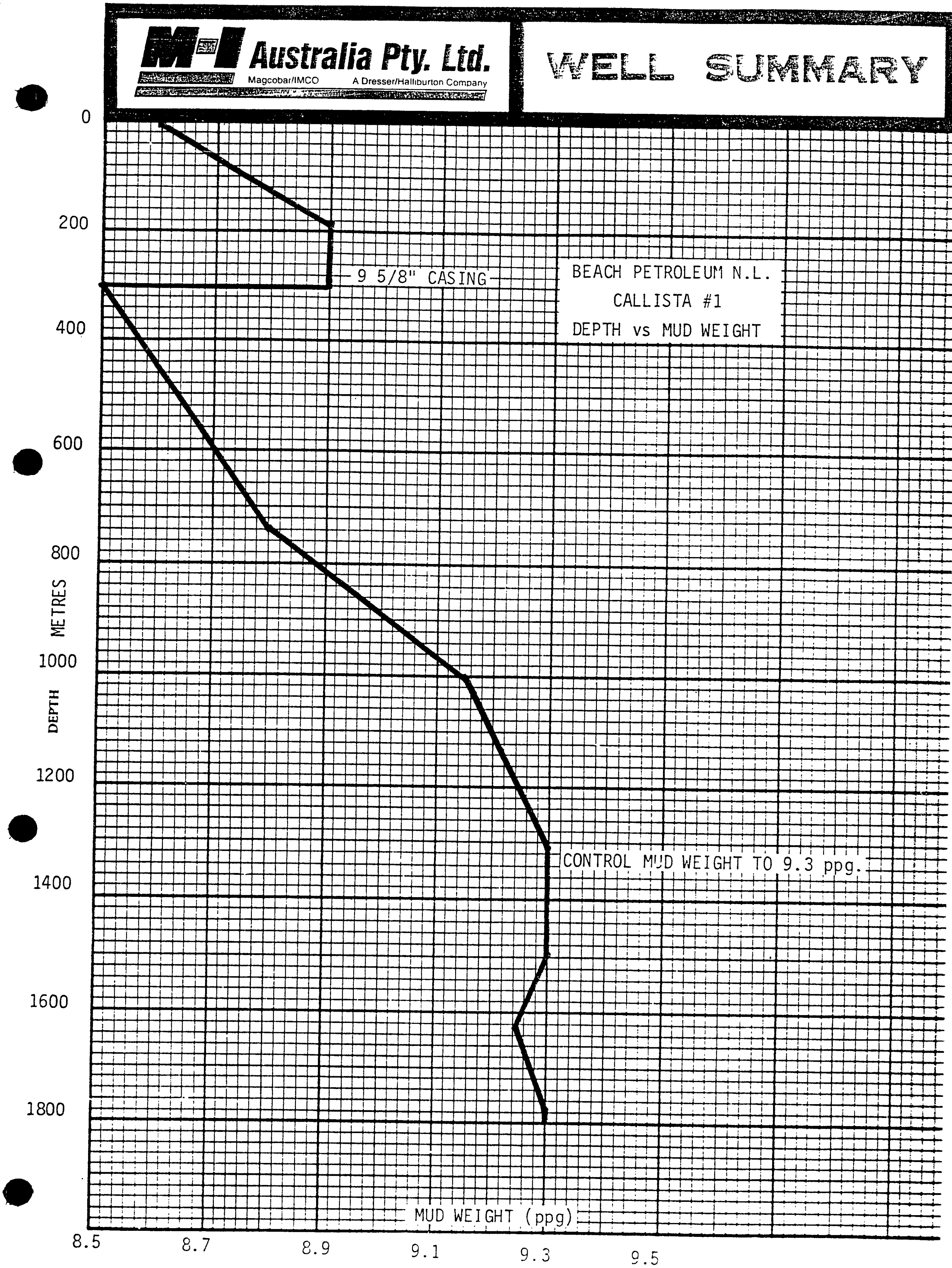
WELL SUMMARY



M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY





M-I Australia Pty. Ltd.
Magcobar/IMCO
A Dresser/Halliburton Company
WELL SUMMARY
BEACH PETROLEUM N.L.
CALLISTA #1
DEPTH vs MUD WEIGHT
9 5/8" CASING
CONTROL MUD WEIGHT TO 9.3 ppg.
DEPTH METRES
0
200
400
600
800
1000
1200
1400
1600
1800
MUD WEIGHT (ppg)
8.5
8.7
8.9
9.1
9.3
9.5

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

BIT AND HYDRAULICS RECORD

BIT & HYDRAULIC RECORD

Contractor GEARHART	Rig No. 2	Location P.E.P. 108, OTWAY BASIN	Well CALLISTA #1
Operator BEACH PETROLEUM		VICTORIA	Engineer M. OLEJNICZAK

Pump Name	Size	Liner Size/Stroke	DRILL Collars O.D. x I.D. x Length	Pipe Drill	Tool Joint Type	Wt/Ft	Pump Output Bbls/Stks
G.D	P 28	5½, 6 x 8"	8", 6¼"	4½	I.F.	16.6lb	.057/.065

Date	Run No.	Size	Make	Type	Jet Size	Depth Out	Metres Drilled	Hours Run	Weight On Bit	R P M	Pump Pressure	Vert Dev	gpm	Ann Vel Ft./min	Condition T-B-G
27.3	1	12¼	HTC	OSCIJG	18, 18,16	302	302	15	10-15	120	500	¼	460	131	1-1-I
29.3	2	8½	RD	S11	3x11	1001	699	38½	15-20	110	600	1	215	159	7-4-3/8
31.3	3	8½	HTC	J11	3x11	1655	654	54	20-25	90	600	3/4	215	159	6-6-1/8
4.4	4	8½	RD	S13G	3x11	1800	145	16½	20-25	90	650		215	159	6-6-I

REMARKS

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

DAILY MUD REPORTS

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO · A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	1
DATE	27/3/ 19 88
DEPTH	190 m
SPUD DATE	27/3/88
PRESENT ACTIVITY	DRILLING

OPERATOR	Beach Petroleum	CONTRACTOR	Gearhart Drilling
REPORT FOR	H Walker	REPORT FOR	S Moor
RIG NO.	2	SECTION, TOWNSHIP, RANGE	Timboon
WELL NAME AND NO.	Callista No. 1	FIELD OR BLOCK NO.	PPL 108
COUNTY, PARISH OR OFFSHORE AREA	[illegible]	STATE/PROVINCE	Victoria

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	12 1/4	TYPE	1C3
JET SIZE	13/13/16	SURFACE CASING	16" in. @ 5 m ft.
DRILL PIPE SIZE	4 1/2	TYPE	16.6 lb
LENGTH		INTERMEDIATE	in. @ ft.
DRILL PIPE SIZE	4 1/2	TYPE	HWDP
LENGTH	124 m	INTERMEDIATE	in. @ ft.
DRILL COLLAR SIZE	6 1/4 / 8 [illegible]	LENGTH	159.6 m
PRODUCTION OR LINER	in. @ ft.		
HOLE	30 bbls	PITS	400 bbls
TOTAL CIRCULATING VOLUME	430 bbls		
IN STORAGE	30 bbl	WEIGHT	[illegible]
MUD TYPE	FW Gel / Native Clay		
PUMP SIZE X IN.	5 1/2 x 8	6 x 8
PUMP MAKE, MODEL	GD PZ8	ASSUMED EFF	97 %
bbl/stk	.054 / .065	stk/min	90 / 70
bbl/min	11.0	gal/min	461
ANNULAR VEL (ft/min)	DP 27	DC 131
CIRCULATION PRESSURE (psi)	450		
BOTTOMS UP (min) (strk)	7		
TOTAL CIRC TIME (min) (strk)	8		

MUD PROPERTIES

	☐ F.L. ☒ PIT	☐ F.L. ☒ PIT
Sample From		
Time Sample Taken	14.00	24.00
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☒ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	8.6	8.9
Funnel Viscosity (sec/qt) API @ °F	45	36
Plastic Viscosity cp @ °F		7
Yield Point (lb/100 ft²)		15
Gel Strength (lb/100 ft²) 10 sec/10 min	/	8 / 12
Filtrate API (cm³/30 min)	NC	NC
API HTHP Filtrate (cm³/30 min) @ °F		—
Cake Thickness (32nd in. API/HTHP)	/	1
Solids Content (% by Vol) ☐ calculated ☐ retort		4
Liquid Content (% by Vol) Oil/Water	/	— / 96
Sand Content (% by Vol)		Trace
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud		—
pH ☐ Strip ☐ Meter @ °F		10.0
Alkalinity Mud (P_m)		—
Alkalinity Filtrate (P_f/M_f)	/	.15 / .35
Chloride (mg/L)		750
Total Hardness as Calcium (mg/L)		70

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

[illegible handwritten treatment notes]

REMARKS

Arrived on site 26/3/88 ... [illegible handwritten remarks]

PRODUCT INVENTORY

PRODUCT INVENTORY	[illegible]	[illegible]	[illegible]	[illegible]	Gel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
STARTING INVENTORY	415	112	49	134	61	21	23	22	11	38	25	38	40	9	1
RECEIVED															
USED LAST 24 hr	—	80	5	—	—	—	—	—	—	5	—	2	—	—	—
CLOSING INVENTORY	415	32	44	134	61	21	23	22	11	33	25	36	40	9	1
COST LAST 24 hr	—	864.0	113.7	—	—	—	—	—	—	237.5	—	27.8	—	—	—
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1	84 / 86 mesh
SHAKER #2	84 / 84 mesh
MUD CLEANER	— mesh
CENTRIFUGE	— hours
DESANDER	10 hours
DESILTER	10 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
M [illegible]	[illegible] 727103		$1031.22	$1031.22

DRILLING MUD REPORT

M-I DISTRICT OFFICE

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 2

DATE 23/3/1988 | DEPTH 3[illegible]

SPUD DATE 22/3/88 | PRESENT ACTIVITY [illegible]

OPERATOR: Beach Petroleum | CONTRACTOR: [illegible] Drilling | RIG NO. 2

REPORT FOR: H Walker | REPORT FOR: S [illegible] | SECTION, TOWNSHIP, RANGE: [illegible]

WELL NAME AND NO.: [illegible] No 1 | FIELD OR BLOCK NO.: [illegible] 102 | COUNTY, PARISH OR OFFSHORE AREA: [illegible] | STATE/PROVINCE: [illegible]

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	TYPE	JET SIZE	CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
2 1/4	IGS	12/15/16	SURFACE 9 5/8 in. @ 297 ft.	HOLE 70 bbls	PITS 350 bbls	PUMP SIZE 5 1/2 x 8, 6 x 8		ANNULAR VEL (ft/min) DP 87 DC 131
DRILL PIPE SIZE 4 1/2	TYPE 16.6#	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 420 bbls		PUMP MAKE, MODEL [illegible]	ASSUMED EFF [illegible] %	CIRCULATION PRESSURE (psi) 500
DRILL PIPE SIZE 4 1/2	TYPE HWDP	LENGTH 174 m	INTERMEDIATE in. @ ft.	IN STORAGE 60 bbl	WEIGHT [illegible]	bbl/stk .057/.065	stk/min 70/70	BOTTOMS UP (min) (strk) 10
DRILL COLLAR SIZE 6 1/4 / 8 EHD		LENGTH 151 m	PRODUCTION OR LINER in. @ ft.	MUD TYPE [illegible]		bbl/min 110	gal/min 461	TOTAL CIRC TIME (min) (strk) 40

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	07:00	
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	8.9	
Funnel Viscosity (sec/qt) API @ °F	36	
Plastic Viscosity cp @ °F	7	
Yield Point (lb/100 ft²)	15	
Gel Strength (lb/100 ft²) 10 sec/10 min	6/12	/
Filtrate API (cm³/30 min)	NC	
API HTHP Filtrate (cm³/30 min) @ °F	—	
Cake Thickness (32nd in. API/HTHP)	—/	/
Solids Content (% by Vol) ☑ calculated ☐ retort	4	
Liquid Content (% by Vol) Oil/Water	—/96	/
Sand Content (% by Vol)	Trace	
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	—	
pH ☑ Strip ☐ Meter @ °F	7.5	
Alkalinity Mud (P_m)	—	
Alkalinity Filtrate (P_f/M_f)	.10/.3	/
Chloride (mg/L)	750	
Total Hardness as Calcium (mg/L)	3[illegible]	

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Cont. drilling through [illegible] with [illegible] water added only, used 12 gel [illegible] mix water for gram slurry.
Dumped and cleaned sandtrap [illegible] and desander tanks and filled with water.

REMARKS

Stopped drilling at 170m [illegible] to build up more pit volume [illegible] due to lost circ. (Partial - lost ≈ 20 bbl [illegible])
Resumed drilling [illegible] at reduced pump rate of 120 spm [illegible] full circulation.
Continued drilling through [illegible] pump rate [illegible] at 120 spm [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

PRODUCT INVENTORY

PRODUCT INVENTORY	[illegible]	[illegible]	Caustic	Gel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Lime	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
STARTING INVENTORY	414	72	44	134	61	31	23	72	11	33	24	36	40	1	1
RECEIVED															
USED LAST 24 hr	—	10	—	12	—	—	—	—	—	—		-	—	—	-
CLOSING INVENTORY	414	72	44	122	61	31	23	72	11	33	24	36	40	1	1
COST LAST 24 hr	—	10.2[illegible]	—	195.[illegible]	—	—	—	—	—	—	—	—	—	—	—
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1 [illegible] mesh
SHAKER #2 [illegible] mesh
MUD CLEANER — mesh
CENTRIFUGE 1/4 hours
DESANDER [illegible] hours
DESILTER [illegible] hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	[illegible]		$[illegible]	$[illegible]

M-I DISTRICT OFFICE

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	3
DATE	21/3/1988
DEPTH	308 m
SPUD DATE	27/3/88
PRESENT ACTIVITY	[illegible]
OPERATOR	Beach Petroleum
CONTRACTOR	Gearhart Drilling
RIG NO.	2
REPORT FOR	[illegible]
REPORT FOR	G. Nicol
SECTION, TOWNSHIP, RANGE	Timboon
WELL NAME AND NO.	Callista No 1
FIELD OR BLOCK NO.	PEP 108
COUNTY, PARISH OR OFFSHORE AREA	Otway Basin
STATE/PROVINCE	Victoria

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½
TYPE	S11
JET SIZE	3x11
CASING SURFACE	9⅝ in. @ 219 m ft.
DRILL PIPE SIZE	4½
TYPE	16.6#
LENGTH	
INTERMEDIATE	in. @ ft.
DRILL PIPE SIZE	4½
TYPE	H.W.D.P.
LENGTH	57.0 m
INTERMEDIATE	in. @ ft.
DRILL COLLAR SIZE	6½ DCs
LENGTH	167.2 m
PRODUCTION OR LINER	in. @ ft.
HOLE	60 bbl
PITS	420 bbl
TOTAL CIRCULATING VOLUME	480 bbl
IN STORAGE	—
WEIGHT	
MUD TYPE	Freshwater / KCl Gel Polymer [illegible]
PUMP SIZE X IN.	5½ x 8 / 6 x 8
PUMP MAKE, MODEL	GD PZ8
ASSUMED EFF %	97
bbl/stk / stk/min	.057/.063 110/—
bbl/min / gal/min	6.27 263
ANNULAR VEL (ft/min)	DP 112 DC 194
CIRCULATION PRESSURE (psi)	500
BOTTOMS UP (min) (strk)	8
TOTAL CIRC TIME (min) (strk)	75

MUD PROPERTIES

	☐ F.L. ☒ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	24.00	
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☐ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	8.5	
Funnel Viscosity (sec/qt) API @ °F	30	
Plastic Viscosity cp @ °F	2	
Yield Point (lb/100 ft²)	3	
Gel Strength (lb/100 ft²) 10 sec/10 min	1/3	/
Filtrate API (cm³/30 min)	N.C.	
API HTHP Filtrate (cm³/30 min) @ °F	—	
Cake Thickness (32nd in. API/HTHP)	—/	/
Solids Content (% by Vol) ☒ calculated ☐ retort	1	
Liquid Content (% by Vol) Oil/Water	—/99	/
Sand Content (% by Vol)	Trace	
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	—	
pH ☒ Strip ☐ Meter @ °F	11.0	
Alkalinity Mud (P_m)	—	
Alkalinity Filtrate (P_f/M_f)	.4/.5	/
Chloride (mg/L)	8000	
Total Hardness as Calcium (mg/L)	450	

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Drilled out cement with predominantly water using [illegible] mud system, [illegible] Ca++ from cement for clay inhibition. Added additional 26 sx KCl for clay inhibition to reduce water consumption and dilution, improve cuttings, less [illegible].

REMARKS

Continued W.O.C. to 03.00 hrs [illegible] of B.O.P. and pressure tested. RIH with 8½" bit. Drilled out cement [illegible] 22[illegible] and drilled [illegible] [illegible] 7 [illegible]. [illegible] out prior to running [illegible] test with Halliburton.

PRODUCT INVENTORY

PRODUCT INVENTORY	Barite	Kwik Thik	Caustic	Gel	CMC (HV)	Polysal	Bicarb	Spersene	D.F. [illegible]	Lime	Soda Ash	KCl	CaCl2	Kwik Seal	[illegible]
STARTING INVENTORY	415	72	44	122	61	31	23	22	11	33	25	36	40	9	1
RECEIVED															
USED LAST hr	—	—	—	—	—	—	—	—	—	—	—	26	—	—	—
CLOSING INVENTORY	415	72	44	122	61	31	23	22	11	33	25	10	40	9	1
COST LAST hr	—	—	—	—	—	—	—	—	—	—	—	$327.66	—	—	—
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1	B40, B60 mesh
SHAKER #2	B40, B40 mesh
MUD CLEANER	— mesh
CENTRIFUGE	— hours
DESANDER	3 [illegible] hours
DESILTER	[illegible] 3 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
Manfred Oetzinger	055-987103		$ 327.66 ✓	$ 1722.10 ✓

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	4
DATE	30/3/1988
DEPTH	737m
SPUD DATE	21/3/88
PRESENT ACTIVITY	Drilling
OPERATOR	Bridge Petroleum
REPORT FOR	[illegible]
CONTRACTOR	[illegible] Drilling
RIG NO.	2
REPORT FOR	G. [illegible]
SECTION, TOWNSHIP, RANGE	[illegible]
WELL NAME AND NO.	Callista No 1
FIELD OR BLOCK NO.	PEP 138
COUNTY, PARISH OR OFFSHORE AREA	Otway Basin
STATE/PROVINCE	Victoria

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½	TYPE 511	JET SIZE 3x11	SURFACE 9⅝ in. @ 295 m	HOLE 170 bbls	PITS 500 bbls	PUMP SIZE X IN. 5½ x 2, 6x6		ANNULAR VEL (ft/min) DP ___ DC ___
DRILL PIPE SIZE 4½	TYPE 16.6lb	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 670 bbls		PUMP MAKE, MODEL GD PZ8	ASSUMED EFF 97 %	CIRCULATION PRESSURE (psi) 600
DRILL PIPE SIZE 4½	TYPE HWDP	LENGTH 55 m	INTERMEDIATE in. @ ft.	IN STORAGE —	WEIGHT	bbl/stk .057/.067	stk/min 90/–	BOTTOMS UP (min) (strk) 22
DRILL COLLAR SIZE 6¼ [illegible]		LENGTH 167.7m	PRODUCTION OR LINER in. @ ft.	MUD TYPE F.W. Native Clay		bbl/min 5.13	gal/min 215	TOTAL CIRC TIME (min) (strk) 130

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Sample From		
Time Sample Taken	06.00	20.00
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	8.6+	8.8
Funnel Viscosity (sec/qt) API @ °F	33	35
Plastic Viscosity cp @ °F	4	5
Yield Point (lb/100 ft²)	12	20
Gel Strength (lb/100 ft²) 10 sec/10 min	4/6	12/12
Filtrate API (cm³/30 min)	– NO CONTROL –	
API HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	+	4
Solids Content (% by Vol) ☑ calculated ☐ retort	2	3
Liquid Content (% by Vol) Oil/Water	–/98	–/97
Sand Content (% by Vol)	Trace	Trace
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	—	—
pH ☐ Strip ☐ Meter @ °F	10.5	9.5
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.3/.45	.1/.2
Chloride (mg/L)	2,000	3,000
Total Hardness as Calcium (mg/L)	320	430
% KCl by wt soln	1½	1½

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Used water with additional KCl for ~1½ [illegible] Gel[illegible] mark. [illegible]. [illegible] of [illegible] to [illegible] clay hydration [illegible] to make [illegible] mud [illegible] Dilwyn sands. Maintain [illegible] water and [illegible] only in Dilwyn.

REMARKS

Ran leak off test giving 11.3 ppg. Continued [illegible] [illegible] [illegible] [illegible] [illegible] 235 gpm. As pump was [illegible] [illegible] gpm [illegible] on connections.

Reduced pump rate to 215 gpm [illegible] Dilwyn Sands [illegible] [illegible] rate [illegible] in sands. [illegible] [illegible] [illegible] [illegible] [illegible] mud [illegible] of 70–30 ft/[illegible] [illegible] [illegible] [illegible] water [illegible] [illegible] [illegible] continued [illegible].

Desilter [illegible] [illegible] [illegible]

PRODUCT INVENTORY

PRODUCT INVENTORY	[illegible]	[illegible]	Caustic	Gel	CMC [illegible]	[illegible]	[illegible]	Spersene	D.I. [illegible]	Lime	Soda Ash	KCl	[illegible]	[illegible]	[illegible]	
STARTING INVENTORY	4[illegible]	72	44	122	61	81	73	22	11	33	25	10	40	9	1	
RECEIVED																
USED LAST 24 hr	—	—	—	—	—	—	2	—	—	4	—	10	—	—	—	
CLOSING INVENTORY	4[illegible]	72	44	122	61	81	71	72	11	29	25	Nil	40	9	1	
COST LAST 24 hr	—	—	—	—	—	—	3396	—	—	190	—	1449	—	—	—	
ROTATING HOURS (from IADC)																

SOLIDS EQUIPMENT

SHAKER #1	84, 86 mesh
SHAKER #2	84, 86 mesh
MUD CLEANER	— mesh
CENTRIFUGE	hours
DESANDER	7–[illegible] 24 hours
DESILTER	[illegible] 6 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	055 [illegible]	–	$ 20[illegible] ✓	[illegible] ✓

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	5
DATE	31 / 3 / 19 88
DEPTH	1001 m
SPUD DATE	27/3/88
PRESENT ACTIVITY	[illegible]

OPERATOR	[illegible] Petroleum	CONTRACTOR	Gearhart Drilling
RIG NO.	2		
REPORT FOR	[illegible]	REPORT FOR	G. Nicol
SECTION, TOWNSHIP, RANGE	Timboon		
WELL NAME AND NO.	[illegible] No 1	FIELD OR BLOCK NO.	PEP 108
COUNTY, PARISH OR OFFSHORE AREA	Otway Basin	STATE/PROVINCE	Victoria

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA			
BIT SIZE	TYPE	JET SIZE	SURFACE	HOLE	PITS	PUMP SIZE X IN.		ANNULAR VEL (ft/min)	
8½	[illegible]	3x11	9⅝ in. @ 299 m	220 bbls	420 bbls	5½ x 6 , 6x8		DP 102	DC 159
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE	TOTAL CIRCULATING VOLUME		PUMP MAKE, MODEL	ASSUMED EFF	CIRCULATION PRESSURE (psi)	
4½	[illegible]		in. @ ft.	640 bbls		GD P28	97 %	600	
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE	IN STORAGE	WEIGHT	bbl/stk	stk/min	BOTTOMS UP (min) (strk)	
4½	[illegible]	55 m	in. @ ft.	80 bbl	PREMIX	.057/.065	90/–	35	
DRILL COLLAR SIZE	LENGTH		PRODUCTION OR LINER	MUD TYPE		bbl/min	gal/min	TOTAL CIRC TIME (min) (strk)	
6¼ [illegible]	167.7 m		in. @ ft.	[illegible]		5.13	215	125	

MUD PROPERTIES

	☐ F.L. ☒ PIT	☐ F.L. ☒ PIT
Sample From		
Time Sample Taken	05:00	17:00
Flowline Temperature (°F) °C	31	31
Depth (ft) (TVD / ft)		970 m
Weight ☒ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.0	9.1+
Funnel Viscosity (sec/qt) API @ °F	32	42
Plastic Viscosity cp @ °F	5	15
Yield Point (lb/100 ft²)	30	16
Gel Strength (lb/100 ft²) 10 sec/10 min	10 / 15	8 / 15
Filtrate API (cm³/30 min)	[illegible]	9.0
API HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	4	2 /32
Solids Content (% by Vol) ☒ calculated ☐ retort	3	5
Liquid Content (% by Vol) Oil/Water	–/97	–/95
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	–	–
pH ☐ Strip ☐ Meter @ °F	10.0	9.5
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.05/1.1	.2/1.5
Chloride (mg/L)	4,500	3,000
Total Hardness as Calcium (mg/L)	250	30

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

[illegible]

REMARKS

[illegible]

PRODUCT INVENTORY	Barite	Kwik Thik	Caustic	Gel	CMC (LV)	Polysal	Bicarb	Spersene	DF-CS	Lime	Soda Ash	KCl	Cello	[illegible]	Pipe lax
STARTING INVENTORY	415	72	44	122	61	21	21	22	11	29	25	–	40	9	1
RECEIVED															
USED LAST 24 hr	15	20	4	–	11	5	3	–	1	–	–	–	–	–	–
CLOSING INVENTORY	400	52	40	122	50	16	18	22	10	29	25	–	40	9	1
COST LAST 24 hr	[illegible] ✓	211 ✓	31 ✓	–	529.22 ✓	1957 ✓	50.48 ✓	–	27.00 ✓	–	–	–	–	–	–
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1	840 / 860 mesh
SHAKER #2	840 / 860 mesh
MUD CLEANER	– mesh
CENTRIFUGE	– hours
DESANDER	[illegible] 19 hours
DESILTER	[illegible] hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	055 72?10?		4127.50 ✓	[illegible] ✓

DRILLING MUD REPORT

M-I DISTRICT OFFICE

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	6
DATE	8/14/1988
DEPTH	1305 m
SPUD DATE	27/3/88
PRESENT ACTIVITY	DRILLING
OPERATOR	BEACH PETROLEUM
REPORT FOR	H. WALKER
CONTRACTOR	GEARHART DRILLING
REPORT FOR	G. NICOL
RIG NO.	2
WELL NAME AND NO.	CALLISTA No 1
FIELD OR BLOCK NO.	P.E.P. 108
COUNTY, PARISH OR OFFSHORE AREA	OTWAY BASIN
SECTION, TOWNSHIP, RANGE	TIMBOON
STATE/PROVINCE	VICTORIA

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½
TYPE	J11
JET SIZE	3 x 11
CASING SURFACE	9⅝ in. @ 249 m ft.
DRILL PIPE SIZE	4½
TYPE	16.6 lb
LENGTH	
INTERMEDIATE	in. @ ft.
DRILL PIPE SIZE	4½
TYPE	HWDP
LENGTH	66.4 m
INTERMEDIATE	in. @ ft.
DRILL COLLAR SIZE	6½ BHA
LENGTH	161.3 m
PRODUCTION OR LINER	in. @ ft.
HOLE	285 bbls
PITS	420 bbls
TOTAL CIRCULATING VOLUME	705 bbls
IN STORAGE	20 bbls
WEIGHT	PREMIX
MUD TYPE	F.W. /GEL/POLYMER
PUMP SIZE X IN.	5½ x 8 GXD
PUMP MAKE, MODEL	GD PZ 8
ASSUMED EFF %	97
bbl/stk	.057/.065
stk/min	90/–
bbl/min	5.13
gal/min	215
ANNULAR VEL (ft/min)	DP 102 DC 159
CIRCULATION PRESSURE (psi)	650
BOTTOMS UP (min) (strk)	45
TOTAL CIRC TIME (min) (strk)	138

MUD PROPERTIES

	☐ F.L. ☒ PIT	☐ F.L. ☒ PIT
Sample From		
Time Sample Taken	05:30	24:00
Flowline Temperature (°F)		34 °C
Depth (ft) (TVD / ft)		1305 m
Weight ☒ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.2+	9.3
Funnel Viscosity (sec/qt) API @ °F	45	40
Plastic Viscosity cp @ °F	15	12
Yield Point (lb/100 ft²)	15	10
Gel Strength (lb/100 ft²) 10 sec/10 min	10/20	7/18
Filtrate API (cm³/30 min)	12	10
API HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	2/32	2/32
Solids Content (% by Vol) ☒ calculated ☐ retort	5	5½
Liquid Content (% by Vol) Oil/Water	–/95	–/94½
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	–	–
pH ☒ Strip ☐ Meter @ °F	9.5	10.0
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.2/1.45	.2/1.6
Chloride (mg/L)	2200	2200
Total Hardness as Calcium (mg/L)	20	30

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

~~RECOMMENDED~~ TOUR TREATMENT

After [illegible] [illegible] – 9.0 [illegible] [illegible] [illegible] [illegible] to [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] at 9.2–9.3 ppg and 45–45. [illegible] [illegible] Solids Control [illegible] and [illegible] [illegible] water loss.

REMARKS

Continued reaming back to bottom from 850 m [illegible] [illegible].

Continued drilling through [illegible] [illegible] [illegible] [illegible] [illegible].

At 1311 m [illegible] to [illegible] [illegible] [illegible] – [illegible] to [illegible] [illegible] [illegible] [illegible] 1200 m to 1000 m. [illegible] [illegible] mud [illegible] [illegible] [illegible] 5. Circ [illegible] [illegible] to clear [illegible] [illegible] [illegible].

[illegible] and [illegible] drilling [illegible] [illegible] [illegible] [illegible].

PRODUCT INVENTORY

PRODUCT INVENTORY	BARITE	KWIK THIK	CAUSTIC	GEL	CMC (REG)	POLYSAL	BICARB	SPERSENE	DT CON	LIME	SODA ASH	KCL	CALLA	KWIK SEAL	FIBRE CAY
STARTING INVENTORY	400	52	40	122	50	76	18	22	10	24	25	–	40	9	1
RECEIVED															
USED LAST 24 hr	–	32	5	–	5	11	–	–	1	–	–	..	–	–	–
CLOSING INVENTORY	400	20	35	122	45	65	18	22	9	24	25	–	40	9	1
COST LAST 24 hr	–	345.6 ✓	113.74 ✓	–	267.[illegible] ✓	416.[illegible] ✓	–	–	27.0[illegible] ✓	–	-	–	–	–	–
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1	B20, 560 mesh
SHAKER #2	B80, 560 mesh
MUD CLEANER	– mesh
CENTRIFUGE	– hours
DESANDER	7HRS 12.3 16 hours
DESILTER	NOT IN USE hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
M. [illegible]	055 72103		$ 1190.[illegible] ✓	$ 6395.17 ✓

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 7

DATE 2-4-1988	DEPTH 1470	
SPUD DATE 27/3/88	PRESENT ACTIVITY Drilling	

OPERATOR Beach Petroleum	CONTRACTOR Gearhart Drilling	RIG NO. 2
REPORT FOR H. Walker	REPORT FOR G. Nicol	SECTION, TOWNSHIP, RANGE Timboon
WELL NAME AND NO. Callista No. 1	FIELD OR BLOCK NO. P.E.P. 108	COUNTY, PARISH OR OFFSHORE AREA Otway Basin	STATE/PROVINCE Victoria

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA			
BIT SIZE 8½	TYPE [illegible]	JET SIZE 3×11	SURFACE 9⅝ in. @ 279 ft.	HOLE 330 bbl	PITS 360 bbl	PUMP SIZE 5½×8, 6×8			ANNULAR VEL (ft/min) DP 102 DC 157
DRILL PIPE SIZE 4½	TYPE 16.6 lb	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 690 bbl		PUMP MAKE, MODEL GD PZ8	ASSUMED EFF 97 %		CIRCULATION PRESSURE (psi) 600
DRILL PIPE SIZE 4½	TYPE H.W.D.P.	LENGTH 66.4 m	INTERMEDIATE in. @ ft.	IN STORAGE — bbl	WEIGHT	bbl/stk .057/.065		stk/min 90/–	BOTTOMS UP (min) (strk) 50
DRILL COLLAR SIZE 6¼ [illegible]	LENGTH 169.3 m		PRODUCTION OR LINER in. @ ft.	MUD TYPE L.W. Gel/Polymer		bbl/min 5.13		gal/min 215	TOTAL CIRC TIME (min) (strk) 135

MUD PROPERTIES	☐ F.L. ☑ PIT	☒ F.L. ☑ PIT
Sample From		
Time Sample Taken	05.00	19.00
Flowline Temperature (°F)		35°C
Depth (ft) (TVD / ft)	1335	1470
Weight ☒ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.2+	9.3
Funnel Viscosity (sec/qt) API @ °F	44	45
Plastic Viscosity cp @ °F	14	14
Yield Point (lb/100 ft²)	13	13
Gel Strength (lb/100 ft²) 10 sec/10 min	7/21	7/20
Filtrate API (cm³/30 min)	9.0	8.0
API HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	2/32	2/32
Solids Content (% by Vol) ☒ calculated ☐ retort	5	5½
Liquid Content (% by Vol) Oil/Water	–/95	–/94½
Sand Content (% by Vol)	Trace	Trace
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	–	–
pH ☐ Strip ☐ Meter @ °F	10.0	10.0
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.35/1.8	.3/1.8
Chloride (mg/L)	1200	1600
Total Hardness as Calcium (mg/L)	40	30

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Continuing to gradually decrease water loss by additions of Premium Gel, Polysal, Permix.

Had to dump sand trap regularly and maintain reasonably high dilution rate to maintain 9.3 ppg mud wt.

REMARKS

Continuing drilling into shale, green mudstone — sandstone variable. Stopped circ. for samples at 1354 m and 1372 m looking for [illegible]. [illegible] at 1398 m ran wiper trip. Had to work tight hole to 1151 m. Then pulled [illegible] to 1067 m before running back in. (Used kelly to wash out — wiper trip 3½ hrs.) Continuing drilling through sands.

—

Had to use defoamer due to very sticky clay when drilling [illegible]. Caustic on [illegible], [illegible] Gel [illegible].

PRODUCT INVENTORY	[illegible]	[illegible]	[illegible]	Gel	CMC [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Lime	Soda Ash	[illegible]	[illegible]	[illegible]	[illegible]
STARTING INVENTORY	20	25	122	45	65	12	22	1	21	25	—	40	9	1	
RECEIVED															
USED LAST 24 hr	20	3	8	3	20	–	–	–	–	–	–	–	–	–	
CLOSING INVENTORY	–	22	114	42	45	13	22	9	21	25	–	40	9	1	
COST LAST 24 hr	211	222	130.46	160.71	775	–	–	–	–	–	–	–	–	–	
USED (from IADC)															

SOLIDS EQUIPMENT

- SHAKER #1 [illegible] / 56 mesh
- SHAKER #2 [illegible] / 560 mesh
- MUD CLEANER — mesh
- CENTRIFUGE — hours
- DESANDER [illegible] 20 hours
- DESILTER [illegible] hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	055 73703		$1,358.54 ✓	$5,703.21 ✓

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 8

DATE 3 - 4 - 19 83 — DEPTH 1655 m

SPUD DATE 27/3/83 — PRESENT ACTIVITY Circ for Trip

OPERATOR	Beach Petroleum
REPORT FOR	H. Walker
CONTRACTOR	Gearhart Drilling
RIG NO.	2
REPORT FOR	G. Nicot
SECTION, TOWNSHIP, RANGE	[illegible]
WELL NAME AND NO	[illegible] No 1
FIELD OR BLOCK NO.	PEP 108
COUNTY, PARISH OR OFFSHORE AREA	Otway Basin
STATE/PROVINCE	Victoria

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½
TYPE	[illegible]
JET SIZE	3x11
DRILL PIPE SIZE	4½
TYPE	16.6#
DRILL PIPE SIZE	4½
TYPE	HWDP
LENGTH	66.4 m
DRILL COLLAR SIZE	6¼ [illegible]
LENGTH	167.2 m
CASING SURFACE	9⅝ in. @ 2?? ft.
INTERMEDIATE	in. @ ft.
INTERMEDIATE	in. @ ft.
PRODUCTION OR LINER	in. @ ft.
HOLE	370 bbl
PITS	430 bbl
TOTAL CIRCULATING VOLUME	800 bbl
IN STORAGE	—
WEIGHT	
MUD TYPE	FW Gel/Polymer
PUMP SIZE X IN.	5½ x 8, 6 x 8
ANNULAR VEL (ft/min)	DP 107 DC 159
PUMP MAKE, MODEL	GD PZ8
ASSUMED EFF %	97
CIRCULATION PRESSURE (psi)	600
bbl/stk / stk/min	.057/.063 — 90/-
BOTTOMS UP (min) (strk)	55
bbl/min / gal/min	5.13 — 2??
TOTAL CIRC TIME (min) (strk)	155

MUD PROPERTIES

	☐ F.L. ☒ PIT	☐ F.L. ☒ PIT
Sample From		
Time Sample Taken	0530	1930
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		1635
Weight ☒ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	9.2+
Funnel Viscosity (sec/qt) API @ °F	44	46
Plastic Viscosity cp @ °F	16	13
Yield Point (lb/100 ft²)	12	12
Gel Strength (lb/100 ft²) 10 sec/10 min	5/18	5/20
Filtrate API (cm³/30 min)	6.3	5.8
API HTHP Filtrate (cm³/30 min) @ °F	—	—
Cake Thickness (32nd in. API/HTHP)	1/32	1/32
Solids Content (% by Vol) ☐ calculated ☐ retort	5½	5
Liquid Content (% by Vol) Oil/Water	-/94½	-/95
Sand Content (% by Vol)	Trace	Trace
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	—	—
pH ☐ Strip ☐ Meter @ °F	9.5	9.5
Alkalinity Mud (P_m)	—	—
Alkalinity Filtrate (P_f/M_f)	.3/.8	.3/1.2
Chloride (mg/L)	1400	1300
Total Hardness as Calcium (mg/L)	20	40

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Continued treatment with [illegible] Gel/Lime/Polymer to maintain low filtrate, wt of 9.2-9.3.

REMARKS

Continued drilling, circ [illegible] sample at 16?? m [illegible]
[illegible] trip [illegible]
hole to 14?? m [illegible]
[illegible] to 1367 m [illegible]
[illegible]
Continued drilling to 1655 m —
[illegible] circ [illegible] for [illegible] trip.

Casing [illegible] at 15?? m [illegible]
8.9" hole size.

PRODUCT INVENTORY

PRODUCT INVENTORY	Barite	Gel	Caustic	[illegible]	[illegible]	Bicarb	Soda Ash	[illegible]	[illegible]	Lime	[illegible]	[illegible]	[illegible]		
STARTING INVENTORY	400	114	32	42	45	18	25	22	9	29	40	9	1		
RECEIVED															
USED LAST 24 hr	15	[illegible]	2	3	17	—	—	—	1	—	—	—	—		
CLOSING INVENTORY	385	93	30	39	28	18	25	22	8	29	40	9	1		
COST LAST 24 hr	100.5	304.??	45.5	160.??	63.??	—	—	—	37.03	—	—	—	—		
USED (from IADC)															

SOLIDS EQUIPMENT

SHAKER #1	80, 56 mesh
SHAKER #2	80, 56 mesh
MUD CLEANER	— mesh
CENTRIFUGE	— hours
DESANDER	[illegible] 10" 2? hours
DESILTER	[illegible] 5" 6 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	[illegible]		$1,2??.??	[illegible]

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

M-I DISTRICT OFFICE

DRILLING MUD REPORT NO. 9

DATE 4/6/1988 DEPTH 1721m

SPUD DATE 27/3/88 PRESENT ACTIVITY Drilling

OPERATOR Beach Petroleum

CONTRACTOR Gearhart Drilling

RIG NO 2

REPORT FOR H. Walker

REPORT FOR G. Nicot

SECTION, TOWNSHIP, RANGE Timboon

WELL NAME AND NO. Callista No 1

FIELD OR BLOCK NO. PEP 108

COUNTY, PARISH OR OFFSHORE AREA Otway Basin

STATE/PROVINCE Victoria

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½	TYPE [illegible]	JET SIZE 3x11	SURFACE 9⅝ in. @ 279m	HOLE 390 bbls	PITS 430 bbl	PUMP SIZE X IN. 5½x8, 6x8		ANNULAR VEL (ft/min) DP 102 DC 159
DRILL PIPE SIZE 4½	TYPE 16.6lb	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 820 bbls		PUMP MAKE, MODEL GD PZ8	ASSUMED EFF 97 %	CIRCULATION PRESSURE (psi) 650
DRILL PIPE SIZE 4½	TYPE Hwdp	LENGTH 66.4m	INTERMEDIATE in. @ ft.	IN STORAGE —	WEIGHT	bbl/stk .057/.065	stk/min 90/—	BOTTOMS UP (min) (strk) 63
DRILL COLLAR SIZE 6¼ Drill	LENGTH 169.3m	PRODUCTION OR LINER in. @ ft.		MUD TYPE F.W. Gel/Polymer		bbl/min 5.13	gal/min 215	TOTAL CIRC TIME (min) (strk) 160

MUD PROPERTIES	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Sample From		
Time Sample Taken	05.00	24.00
Flowline Temperature (°F)		35°C.
Depth (ft) (TVD / ft)	1655m.	1721m
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	9.3
Funnel Viscosity (sec/qt) API @ °F	46	48
Plastic Viscosity cp @ °F	18	19
Yield Point (lb/100 ft²)	14	16
Gel Strength (lb/100 ft²) 10 sec/10 min	6/20	5/18
Filtrate API (cm³/30 min)	6.6	6.5
API HTHP Filtrate (cm³/30 min) @ °F	—	—
Cake Thickness (32nd in. API/HTHP)	1/32	1/32
Solids Content (% by Vol) ☑ calculated ☐ retort	6½	5½
Liquid Content (% by Vol) Oil/Water	-/94%	-/95%
Sand Content (% by Vol)	Trace	Trace
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	—	10
pH ☑ Strip ☐ Meter @ °F	9.5	9.5
Alkalinity Mud (P_m)	—	—
Alkalinity Filtrate (P_f/M_f)	.3/.9	.25/.9
Chloride (mg/L)	1200	1250
Total Hardness as Calcium (mg/L)	30	20

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Continue mud [illegible] Pretreating Gel/CMC/[illegible] [illegible] [illegible] Prior [illegible] [illegible] at [illegible] for coring.

REMARKS

POH [illegible] [illegible] Reamed 90' [illegible] [illegible] [illegible] Continued [illegible] [illegible] at [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

PRODUCT INVENTORY	[illegible]	Gel	Caustic	CMC	[illegible]	Bicarb	Soda Ash	[illegible]	[illegible]	Lime	[illegible]	[illegible]	[illegible]	
STARTING INVENTORY	325	93	30	39	28	18	25	22	8	29	60	9	1	
RECEIVED														
USED LAST 24 hr	—	13	2	4	8	—	—	—	1	2	—	—	—	
CLOSING INVENTORY	325	80	28	35	20	18	25	22	7	27	60	9	1	
COST LAST 24 hr	—	232	[illegible]	216	[illegible]	—	—	—	36	95	—	—	—	
USED (from IADC)														

SOLIDS EQUIPMENT

SHAKER #1 F80 / S60 mesh

SHAKER #2 F80 / mesh

MUD CLEANER — mesh

CENTRIFUGE — hours

DESANDER [illegible] 19 hours

DESILTER [illegible] 12 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]			$[illegible] ✓	$[illegible] ✓

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

M-I DISTRICT OFFICE

DRILLING MUD REPORT NO. 10

DATE 5/4/ 1988 DEPTH 1200

SPUD DATE 27/3/88 PRESENT ACTIVITY LOGGING

OPERATOR: BEACH PETROLEUM	CONTRACTOR: GEARHART [illegible]	RIG NO. 2	
REPORT FOR: H. WALKER	REPORT FOR: G. NICOL	SECTION, TOWNSHIP, RANGE: [illegible]	
WELL NAME AND NO.: CALLISTO No 1	FIELD OR BLOCK NO.: P.E.P 108	COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½	TYPE S13G	JET SIZE 3x11	SURFACE 9⅝ in. @ 299 ft.	HOLE 390 bbl	PITS 400 bbl	PUMP SIZE X IN. 5½ x 8, 6x8		ANNULAR VEL (ft/min) DP 102 DC 157
DRILL PIPE SIZE 4½	TYPE 16.6 lb	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 790 bbl		PUMP MAKE, MODEL GD PZ8	ASSUMED EFF 97 %	CIRCULATION PRESSURE (psi) 650
DRILL PIPE SIZE 4½	TYPE Hwdp	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE —	WEIGHT —	bbl/stk .057/.065	stk/min 90/-	BOTTOMS UP (min) (strk) 60
DRILL COLLAR SIZE 6¼	LENGTH --		PRODUCTION OR LINER in. @ ft.	MUD TYPE FW. Gel/Polymer		5.13 bbl/min	7.6 gal/min	TOTAL CIRC TIME (min) (strk) 155

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	No Circ.	
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	
Funnel Viscosity (sec/qt) API @ °F	43	
Plastic Viscosity cp @ °F	19	
Yield Point (lb/100 ft²)	16	
Gel Strength (lb/100 ft²) 10 sec/10 min	5/17	/
Filtrate API (cm³/30 min)	6.5	
API HTHP Filtrate (cm³/30 min) @ °F	—	
Cake Thickness (32nd in. API/HTHP)	2/32	/
Solids Content (% by Vol) ☑ calculated ☐ retort	5½	
Liquid Content (% by Vol) Oil/Water	-/94½	/
Sand Content (% by Vol)	Trace	
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud	[illegible]	
pH ☑ Strip ☐ Meter @ °F	9.5	
Alkalinity Mud (P_m)	—	
Alkalinity Filtrate (P_f/M_f)	.35/.9	/
Chloride (mg/L)	1200	
Total Hardness as Calcium (mg/L)	200	

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

Monitor and Condition Samples during Logging

REMARKS

Continued drilling to 1200 [illegible] ran in [illegible] [illegible] [illegible] tight [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] Circ [illegible] [illegible] [illegible] [illegible] Running [illegible] [illegible] [illegible] [illegible] [illegible] for [illegible]. [illegible] [illegible] [illegible] [illegible] - [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] on Rig.

PRODUCT INVENTORY

PRODUCT INVENTORY	[illegible]	[illegible]	Caustic	[illegible]	Polysal	Bicarb	Soda Ash	Spersene	D.I. [illegible]	Lime	[illegible]	[illegible]	Pipe Lax			
STARTING INVENTORY	325	90	28	35	20	18	25	22	7	27	40	9	1			
RECEIVED																
USED LAST 24 hr	17	—	—	—	—	—	—	—	—	—	—	—	—			
CLOSING INVENTORY	308	90	28	35	20	18	25	22	7	27	40	9	1			
COST LAST 24 hr	[illegible]	—	—	—	—	—	—	—	—	—	—	—	—			
USED (from IADC)																

SOLIDS EQUIPMENT

SHAKER #1 80 / 80 mesh
SHAKER #2 80 / 80 mesh
MUD CLEANER — mesh
CENTRIFUGE — hours
DESANDER 2 [illegible] 6 hours
DESILTER 2 [illegible] 6 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	[illegible]		$ 110.90	$ [illegible]

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	11
DATE	6 / 4 / 1988
DEPTH	1800 m
SPUD DATE	27/3/88
PRESENT ACTIVITY	Plug and Abandon

OPERATOR	Beach Petroleum	CONTRACTOR	Gearhart Drilling
REPORT FOR	H. Walker	REPORT FOR	G. Nicol
RIG NO.	2	SECTION, TOWNSHIP, RANGE	[illegible]
WELL NAME AND NO.	Callister No 1	FIELD OR BLOCK NO.	PEP 108
COUNTY, PARISH OR OFFSHORE AREA	Otway Basin	STATE/PROVINCE	Victoria

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE	TYPE	JET SIZE	SURFACE in. @ ft.	HOLE	PITS	PUMP SIZE X IN.		ANNULAR VEL (ft/min) DP DC
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME		PUMP MAKE, MODEL	ASSUMED EFF %	CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE	WEIGHT	bbl/stk	stk/min	BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE		bbl/min	gal/min	TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES

	☐ F.L. ☐ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken		
Flowline Temperature (°F)		
Depth (ft) (TVD / ft)		
Weight ☐ (ppg) ☐ (lb/cu ft) ☐ (sp gr)		
Funnel Viscosity (sec/qt) API @ °F		
Plastic Viscosity cp @ °F		
Yield Point (lb/100 ft²)		
Gel Strength (lb/100 ft²) 10 sec/10 min	/	/
Filtrate API (cm³/30 min)		
API HTHP Filtrate (cm³/30 min) @ °F		
Cake Thickness (32nd in. API/HTHP)	/	/
Solids Content (% by Vol) ☐ calculated ☐ retort		
Liquid Content (% by Vol) Oil/Water	/	/
Sand Content (% by Vol)		
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud		
pH ☐ Strip ☐ Meter @ °F		
Alkalinity Mud (P_m)		
Alkalinity Filtrate (P_f/M_f)	/	/
Chloride (mg/L)		
Total Hardness as Calcium (mg/L)		

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

REMARKS

Completed logging, plug and abandon. Engineer released.

Pipe lax drum damaged and carried out during last rig move. Item [illegible] — So [illegible] as damage.

PRODUCT INVENTORY

PRODUCT INVENTORY	Barite	Gel	Caustic	CMC (Hivis)	Polymer	Bicarb	Soda Ash	Stabilite	DI Lube	Lime	Celite	Kwik Seal	Pipe Lax
STARTING INVENTORY	368	80	28	35	20	13	25	22	7	27	40	9	1
RECEIVED													
USED LAST 24 hr	—	—	—	—	—	—	—	—	—	1	3	—	1
CLOSING INVENTORY	367	80	28	35	20	13	25	22	7	26	37	9	—
COST LAST 24 hr	—	—	—	—	—	—	—	—	—	4.75	41.00	—	58.75
USED (from IADC)													

SOLIDS EQUIPMENT

SHAKER #1	/ mesh
SHAKER #2	/ mesh
MUD CLEANER	mesh
CENTRIFUGE	hours
DESANDER	hours
DESILTER	hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
[illegible]	[illegible] 727103		$ 63.25	$ [illegible]

M-I Australia Pty. Ltd.
Magcobar/IMCO A Dresser/Halliburton Company

WELL SUMMARY

WELL HISTORY SHEET

MATERIALS INVENTORY

WELL HISTORY
WA0-464-6

Magcobar
DRILLING FLUID SERVICES

OPERATOR: BEACH PETROLEUM N.L.	SECTION:	TOWNSHIP: TIMBOON	RANGE:
WELL: CALLISTA #1	FIELD: WILDCAT		
CONTRACTOR: GEARHART DRILLING	COUNTY/PARISH: P.E.P. 108		
ENGINEERS: M. OLEJNICZAK	STATE: VICTORIA		

MUD TYPE	F.W. GEL POLYMER
SPUD DATE	27th March, 1988
T D DATE	6th April, 1988
DAYS TO T D	11

	SIZE	DEPTH	BIT SIZE	No. BITS	ROTATING HOURS	DEGASSER	DESANDER	DESILTER	CENTRIFUGE	SHAKER SCREENS
CONDUCTOR	16"	5 m								
SURFACE	9 5/8"	299 m	12 1/4	1	15					
INTERMEDIATE		1800m	8 1/2	3	109					
LINERS										
PRODUCTION										

DATE	MEASURED DEPTH M	TVD	MUD WT	VIS SEC	ANGLE AND DIRECTION	FLOW RATE (gpm)	FLOW LINE TEMP °C	PV.	YP.	GELS 0/10	PH	API FLUID LOSS	HTHP FLUID LOSS	P_f	M_f	P_m	SALT OR CHLORIDE mg/l	CALCIUM (ppm)	SOL %	OIL %	BARITE	MAGCOGEL	KWIK THIK	CAUSTIC	BICARB	KCL	CMC EHV	POLYSAL	LIME	D.I. CIDE	CAL. CHL.	PIPE LAX	MUD COST
27.3	190		8.9	36		460		7	15	8 / 18	10.0	N.C.	-	.15	.35	-	750	20	4	-			80	5		2			5				1031.32
Spud with Lime flocculated Bentonite, through limestone. Lost partial circ. from 170 m. Revert to water additions only.																																	
28.3	302		8.9	36		460		7	15	6 / 18	9.5	N.C.	-	.1	.3	-	750	30	4	-		12	10										303.12
Continued drilling through Marl with water additions and full returns. Wiper trip and cemented csg at 302 m																																	
29.3	308		8.5	30		263		2	3	1 / 3	11.0	N.C.	-	.4	.5	-	8000	450	1	-						26							387.66
Drilled out cement and shoe with predominantly water. Made 5 m of hole to 308 m to run leak off test.																																	
30.3	737		8.8	35		215	31	4	20	12 / 12	9.5	N.C.	-	.1	.2	-	8000	400	3	-					2	10			4				202.06
Continued drilling through Marl with water and some KCl. Reduced pump rate in Dilwyn sands from about 600m																																	
31.3	1001		9.1½	45		215	31	15	16	8 / 15	9.5	9.1	-	.2	.5	-	3000	30	5	-	15		20	4	3		11	5		1			1278.51
Maintained flocculated Bentonite through Dilwyn sands. Deflocculated and reduced filtrate prior to Pebble Point formation.																																	
1.4	1305		9.3	40		215	34	12	10	7 / 18	10.0	10	-	.3	.6	-	2200	30	5½	-			32	5			5	11		1			1190.50
Allowed filtrate to increase through Paraate sands maintaining with Bentonite - CMC EHV additions only. Reduce filtrate prior to Nullawarre Greensand.																																	
2.4	1495		9.3	45		215	35	14	13	7 / 20	10.0	8.0	-	.3	.8	-	1600	30	5½	-		8	20	3			3	20					1350.04
Drilled through Skull Creek mudstone into Nullawarra. Wiper trip at 1398 m tight.																																	
3.4	1655		9.2½	46		215	-	18	12	5 / 20	9.5	5.8	-	.3	.8	-	1350	40	5		15	21		2			3	17		1			1343.97
Drilled to 1655, into Belfast mudstone and Warre formation. Trip for bit change.																																	
4.4	1781		9.3	48		215	35	19	16	5 / 18	9.5	6.5	-	.25	.9	-	1250	20	5½			13		2			4	8	2	1			827.71
Drilled into Eumarella formation from about 1700 m.																																	
5.4	1800		9.3	48		215	-	19	16	5 / 18	9.5	6.5	-	.25	.9	-	1250	20	5½		17												118.90
Drilled to 1800 m T.D. Wiper trip. P.O.H. and began wireline logging.																																	
6.4	1800																												1		3	1	634.25
Completed logging, plug and abandon well. Engineer released																																	

(1)

OPERATOR Beach Petroleum CONTRACTOR Gearhart Drilling ~~Beach Petroleum~~ WELL Callista No. 1

Magcobar

DATE / PRODUCT	UNIT	BAL	27/3/88 RECD	USED	BAL	28/3/88 RECD	USED	BAL	29/3/88 RECD	USED	BAL	30/3/88 RECD	USED	BAL	31/3/88 RECD	USED	BAL	1/4/88 RECD	USED	BAL	2/4/88 RECD	USED	BAL	TOTAL FOR WEEK RECD	USED	BAL
MAGCOBAR	50kg ~~50kg~~	415			415			415			415			415		15	400			400			400	415	15	400
MAGCOGEL	100lb	134			134		12	122			122			122			122			122		8	114	134	20	114
SPERSENE	25kg	22			22			22			22			22			22			22			22	22	—	22
XP 20																										
RESINEX																										
CAUSTIC SODA	25kg	49		5	44			44			44			44		4	40		5	35		3	32	49	17	32
Kwik Thik	25kg	162		80	82		10	72			72			72		20	52		32	20		20	—	162	162	—
Bicarbonate	40kg	23			23			23			23		2	21		3	18			18			18	23	5	18
Soda Ash	40kg	25			25			25			25			25			25			25			25	25	—	25
Calcium Chloride	25kg	40			40			40		~~36~~	40			40			40			40			40	40	—	40
Lime	25kg	38		5	33			33			33		4	29			29			29			29	32	9	29
Potassium Chloride	50kg	38		2	36			36		26	10		10	—			—			—			—	32	38	—
CMC (EHV)	25kg	61			61			61			61			61		11	50		5	45		3	42	61	19	42
Polysal	25kg	81			81			81			81			81		5	76		11	65		20	45	81	36	45
D.I.-Cide	25L	11			11			11			11			11		1	10		1	9			9	11	2	9
Kwik Dril	5L	9			9			9			9			9			9			9			9	9	—	9
Pipe Lax	205L	1			1			1			1			1			1			1			1	1	—	1
Sodium Sulphate	50kg	1			1			1			1			1			1			1			1	1	—	1
Salt	50kg	20			20			20			20			20			20			20			20	20	—	20
Salt	25kg	15			15			15			15			15			15			15			15	15	—	15

Transferred From Iona No 1.

(2)

OPERATOR Beach Petroleum CONTRACTOR Gearhart Drilling WELL Callista No. 1

DATE			3/4/88			4/4/88			5/4/88			6/4/22			7/4/88			8/4/88			9/4/22			TOTAL FOR WEEK		
PRODUCT	UNIT	BAL	RECD	USED	BAL	RECD.	USED	BAL	RECD.	USED	BAL	RECD.	USED	BAL.	RECD.	USED	BAL	RECD.	USED	BAL	RECD	USED	BAL	RECD	USED	BAL
MAGCOBAR	50kg	400		15	385		4	385		17	368			368											32	362
MAGCOGEL	100lb	114		21	93		13	80			80			80											34	80
SPERSENE	25kg	22			22			22			22			22											—	22
XP-20																										
RESINEX																										
CAUSTIC SODA	25kg	32		2	30		2	28			28			28											4	28
Kwik Thik	25kg	—			—			—			—			—											—	—
Bicarbonate	40kg	18			18			18			18			18											—	18
Soda Ash	40kg	25			25			25			25			25											—	25
Calcium Chloride	25kg	40			40			40			40		3	37											3	37
Lime	25kg	29			29		2	27			27		1	26											3	26
Potassium Chloride	50kg	—			—			—			—			—											—	—
CMC (RHU)	25kg	42		3	39		4	35			35			35											7	35
Polysal	25kg	45		17	28		8	20			20			20											25	20
DT-Clor	25L	9		1	8		1	7			7			7											2	7
Kwik Drill	5L	9			9			9			9			9											—	9
Pipe Lax	205L	1			1			1			1		1	0											1	—
Sodium Sulphite	50kg	1			1			1			1			1											—	1
Salt	50kg	20			20			20			20			20											—	20
Salt	25kg	15			15			15			15			15											—	15

APPENDIX 4

Sidewall Core Descriptions

CALLISTA No.1
SIDEWALL CORE DESCRIPTIONS

SWC	Depth (m)	Rec (cm)	Lithology
1	1794	2.5	SILTSTONE, medium green grey, soft to firm, very dispersive, slightly calcareous, very argillaceous, trace carbonaceous detritus, no show.
2	1792	3.5	SILTSTONE, medium green grey, soft to firm, very dispersive, non calcareous, very common carbonaceous detritus, common very fine lithics, grades to very fine grained SANDSTONE, no show.
3	1788	3.2	SILTSTONE, medium to light grey, firm, dispersive, non calcareous, very argillaceous, common carbonaceous detritus, grades to very fine grained SANDSTONE, no show.
4	1737	3.0	SANDSTONE, lithic, light green grey, firm to friable, very fine to fine grained, subangular to subrounded, abundant argillaceous matrix, very calcareous, common creamy white feldspathic lithics, good trace carbonaceous detritus, very poor visual porosity, no show.
5	1734	3.0	CLAYSTONE, dark grey, soft, dispersive, non calcareous, very carbonaceous, silty, no show.
6	1731	3.0	CLAYSTONE, as above, no show.
7	1722	2.8	SANDSTONE, quartzose, patchy off-white to medium grey, friable, very fine to coarse grained, angular to subangular, poorly sorted quartz, abundant white and medium grey argillaceous matrix, non calcareous, trace black coally lithics, trace soft off-white lithics, poor visual porosity, no show.

8	1719.5	2.5	CLAYSTONE, dark grey, soft dispersive, non calcareous, very carbonaceous, silty, with fine grained quartz sand laminae, no show.
9	1715	4.0	CLAYSTONE, dark grey, firm, dispersive in part, micromicaceous, common carbonaceous laminae, silty in part, with interbedded SANDSTONE quartzose, light grey, light green grey, firm, friable in part, very fine grained, well sorted, subangular to subrounded, argillaceous matrix, non calcareous, trace lithics, poor visual porosity, no show.
10	1699.5	2.8	SANDSTONE, quartzose, off-white light grey , soft to firm, very friable, very fine to medium grained, dominantly fine, subangular to subrounded, moderate to well sorted quartz, abundant calcite cement, trace white argillaceous matrix, trace carbonaceous detritus, trace green lithics, fair to good visual porosity, no show.
11	1694	3.0	SILTSTONE, medium grey, medium grey brown, firm, dispersive in part, slightly calcareous, micromicaceous, trace fine quartz grains, no show.
12	1689	3.2	SILTSTONE, light grey, light brown grey, firm to moderately hard, calcareous in part, argillaceous in part, trace carbonaceous detritus, occasional green lithics, grades to very fine grained SANDSTONE, no show.
13	1681.5	2.7	SANDSTONE, quartzose, off white, light grey, friable, fine to medium grained, subangular to subrounded, moderate sorting, common grey white argillaceous matrix, weak calcite cement, common black carbonaceous detritus and laminae, fair visual porosity, no show.

14	1678	2.1	SANDSTONE, quartzose, light grey, light brown, friable, very fine to medium grained, dominantly fine grained, subangular, moderate to poorly sorted quartz, common grey white argillaceous matrix, slightly calcareous, abundant black carbonaceous laminae, fair to good visual porosity, no show.
15	1674	2.4	SANDSTONE, quartzose, light grey, light brown, soft, friable, very fine to medium grained, dominantly fine grained, subangular to subrounded, dominantly subangular, moderate to poorly sorted quartz, common grey white argillaceous matrix, slightly calcareous, trace carbonaceous detritus, fair visual porosity, no show.
16	1665	3.5	CLAYSTONE, medium to dark grey, firm, massive micromicaceous in part, silty in part, trace carbonaceous detritus, no show.
17	1616	3.0	SANDSTONE, lithic, dark green, black, very dark grey, loose, friable in part, medium to coarse grained, subrounded to rounded, poorly sorted, common ? carbonaceous matrix, dark grey, dispersive, argillaceous matrix in part, fair visual porosity, no show.
18	1605	3.2	CLAYSTONE, dark grey, firm, massive, dispersive, micromicaceous, very carbonaceous, non-calcareous, silty, no show.
19	1583	3.1	CLAYSTONE, as above, no show.

20	1370.5	2.3	SANDSTONE, quartzose, green, green olive grey, friable, medium to coarse quartz, subangular to subrounded, moderately sorted, clear, light brown, light green quartz grains, common patchy off white to medium green argillaceous and silty matrix, non-calcareous, common medium grained rounded ? chamositic pellets, fair to poor visual porosity, no show.
21	1153	1.8	SANDSTONE, quartzose, off white, friable, fine to very coarse grained, subangular to subrounded, poorly sorted, common white silty matrix, non-calcareous, friable, black coally lithics, fair to poor visual porosity, no show.
22	930	3.0	SANDSTONE, quartzose, medium brown, medium orange to brown, friable, subangular to subrounded, poorly to moderately sorted, clear, translucent and iron oxide stained quartz, moderate, very dispersive, silty, medium to dark brown, iron oxide rich matrix, non-calcareous, trace dark brown soft lithics, fair visual porosity, no show.
23	903	4.0	CLAYSTONE dark grey, dark grey brown, firm, dispersive, silty, micromicaceous, very carbonaceous, good trace fine quartz, very dark green rounded ? chamositic pellets, no show.

APPENDIX 5

Velocity Survey

WELL VELOCITY SURVEY

CALISTA NO. 1

PEP-104

VICTORIA

for

BEACH PETROLEUM N.L.

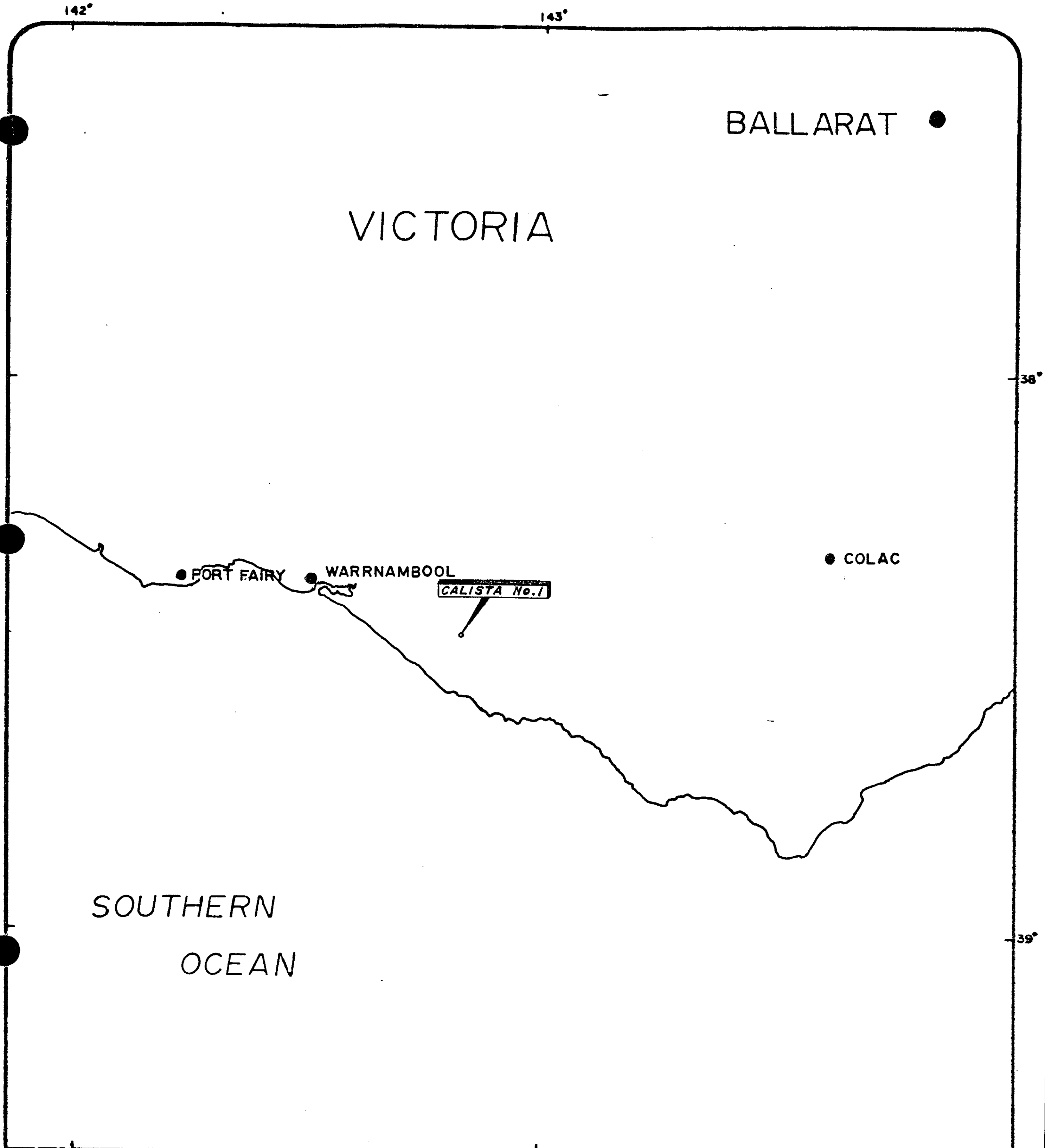
by

VELOCITY DATA PTY. LTD.

Brisbane, Australia

April 15, 1988.

CONTENTS



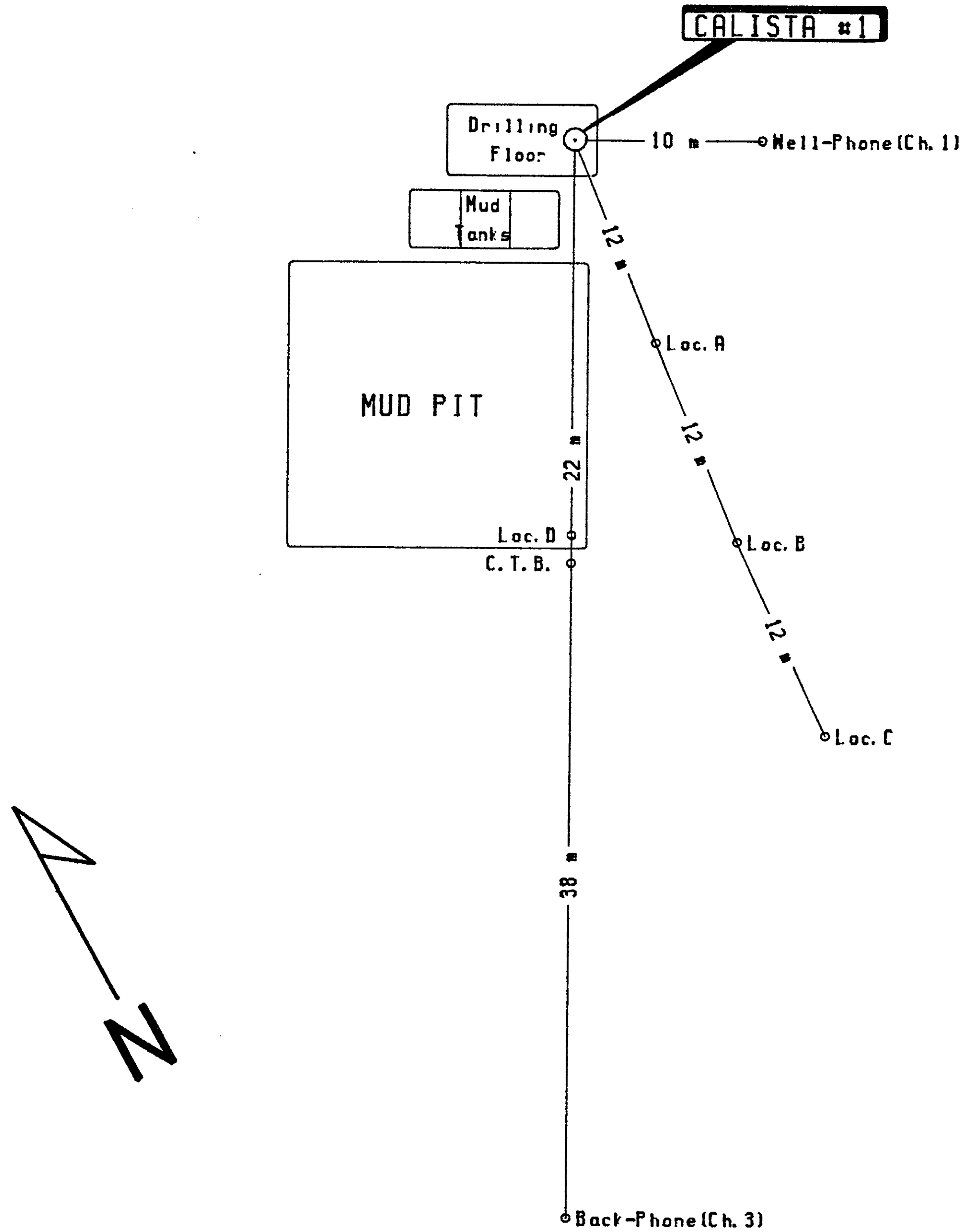
CALISTA No.1

BEACH PETROLEUM N.L.

WELL LOCATION MAP

Scale 1:1000 000

Figure 1



CALISTA #1

BEACH PETROLEUM N. L.

SHOT POINT LOCATION SKETCH

Figure 2

SUMMARY

Velocity Data Pty. Ltd. conducted a velocity survey for Beach Petroleum N. L. in the Calista No.1 well, PEP-104 Victoria. The date of the survey was April 6,1988.

The results of the survey, which are considered to be reliable, have been used to calibrate the sonic log.

Explosives were used as an energy source with shots being fired in the mud pit.

GENERAL INFORMATION

Name of Well	:	Calista No. 1
Location (Figure 1)	:	PEP-104 Victoria
Coordinates	:	Latitude 038 28' 00"
	:	Longitude 142 50' 13"
Date of Survey	:	April 6, 1988.
Wireline Logging	:	Gearhart
Weather	:	Fine
Operational Base	:	Brisbane
Operator	:	G. Young
Client Representative	:	B. Rayner

EQUIPMENT

Downhole Tool

Veldata Camlock 100 (90 mm)

Sensors:

6 HSI 4.5 Hz 215 ohm, high temperature (300 degrees F) detectors connected in series parallel. Frequency response 8-300 Hz within 3 dB.

Preamplifier:

48 dB fixed gain.
Frequency response 5-200 Hz within 3 dB.

Reference Geophone

Mark Products L1 4.5 Hz

Recording Instrument

VDLS 11/10 software controlled digital recording system utilising SIE OPA-10 floating point amplifiers for digital recording and SIE OPA-4 amplifiers for analog presentation. The system includes a DEC LSI-11 CPU, twin cassette tape unit and printer.

RECORDING

Energy Source	:	Explosive; AN-60
Shot Location	:	Mud pit
Charge Size	:	0.5 to 2 (125 gm) sticks
Shot Depths	:	0.9 to 1.5 metres
Shot Offsets	:	12.0 to 36.0 metres
Recording Geometry	:	Figure 2

Shots were recorded on digital cassette tape and later transcribed to nine track tape (SEG-Y format) in Velocity Data's Brisbane centre. Printouts of the shots used are included with this report. (Enclosure 2)

The sample rate was 1 ms with 0.5 ms sampling over a 200 ms window encompassing the first arrivals. The scale of the graphic display varies with signal strength and is noted on each playout.

The times were picked from the printouts using the numerical value of the signal strength. (Enclosure 2)

PROCESSING

Elevation Data

Elevation of KB	:	81.9 metres above sea level
Elevation of Ground	:	77.0 metres above sea level
Elevation of Seismic Datum	:	Sea Level
Depth Surveyed	:	1797.7 metres below KB
Sonic Log Interval	:	300.0 to 1798.0 metres below KB

PROCESSING

Recorded Data

Number of Shots Used	:	29
Number of Levels Recorded	:	23
Data Quality	:	Good
Noise Level	:	Low
Rejected Shots	:	2

Correction for Instrument Delay and Shot Offset

The 'corrected' times shown on the calculation sheet have been obtained via:

(i) Subtraction of the instrument delay (4 ms) from the recorded arrival times

(ii) geometric correction for non-verticality of ray paths resulting from shot offset.

(iii) shot static correction to correct for the depth of shot below ground level at the well head using a correction velocity of 750 m/sec

(iv) readdition of the instrument delay (4 ms).

The shot static correction velocity was determined from the surface geophone data.

Correction to Datum

The datum correction was determined directly by locking the tool at the datum and recording times from four different offsets. The datum correction used (45.6 msec) is the average of the corrected times for these shots.

PROCESSING

Calibration of Sonic Log - Method

Sonic times were adjusted to checkshot times using a linear correction of the sonic transit times.

These differences arise as the sonic tool measures the local velocity characteristics of the formation with a high frequency signal, whereas the downhole geophone records the bulk velocity character using a signal of significantly lower frequency.

Calibration of Sonic Log - Results (Enclosure 1)

The discrepancies between shot and sonic interval velocities were generally small. The largest adjustment was 32.71 us/metre on the interval 1696.8 to 1797.7 metres below KB.

In aggregate, the shot and sonic interval times differed by -1.3 ms over the logged portion of the well.

PROCESSING

Trace Playouts (Figure 4)

Figure 4A is a plot of all traces used. No filter or gain recovery has been applied.

Figure 4B is a plot to scale in depth and time of selected traces. No filter or gain recovery has been applied.

Figure 4C is a plot to scale in depth and time of selected traces with a 5 Hz - 40 Hz filter and a gain recovery function of t^2 applied.

Figure 4D is a plot of selected surface traces. No filter or gain recovery has been applied.

Wayne Mogg
Geophysicist.

PE905709

This is an enclosure indicator page.
The enclosure PE905709 is enclosed within the container PE902189 at this location in this document.

The enclosure PE905709 has the following characteristics:

ITEM_BARCODE = PE905709
CONTAINER_BARCODE = PE902189
NAME = Velocity Data Table
BASIN = OTWAY
PERMIT = PEP/104
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Velocity Data Table, Shot Calculations, (from appendix 5 of WCR) for Calista-1
REMARKS =
DATE_CREATED = 6/04/88
DATE_RECEIVED =
W_NO = W972
WELL_NAME = CALISTA-1
CONTRACTOR = VELOCITY DATA PTY LTD
CLIENT_OP_CO = BEACH PETROLEUM N.L.

(Inserted by DNRE - Vic Govt Mines Dept)

PE905710

This is an enclosure indicator page.
The enclosure PE905710 is enclosed within the container PE902189 at this location in this document.

The enclosure PE905710 has the following characteristics:

ITEM_BARCODE = PE905710
CONTAINER_BARCODE = PE902189
NAME = Velocity Data Table
BASIN = OTWAY
PERMIT = PEP/104
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Velocity Data Table, Shot Calculations, (from appendix 5 of WCR) for Calista-1
REMARKS =
DATE_CREATED = 6/04/88
DATE_RECEIVED =
W_NO = W972
WELL_NAME = CALISTA-1
CONTRACTOR = VELOCITY DATA PTY LTD
CLIENT_OP_CO = BEACH PETROLEUM N.L.

(Inserted by DNRE - Vic Govt Mines Dept)

PE905711

This is an enclosure indicator page.
The enclosure PE905711 is enclosed within the container PE902189 at this location in this document.

The enclosure PE905711 has the following characteristics:

ITEM_BARCODE =	PE905711
CONTAINER_BARCODE =	PE902189
NAME =	Velocity Data Table
BASIN =	OTWAY
PERMIT =	PEP/104
TYPE =	WELL
SUBTYPE =	VELOCITY_CHART
DESCRIPTION =	Velocity Data Table, Sonic Calibration (from appendix 5 of WCR) for Calista-1
REMARKS =	
DATE_CREATED =	6/04/88
DATE_RECEIVED =	.
W_NO =	W972
WELL_NAME =	CALISTA-1
CONTRACTOR =	VELOCITY DATA PTY LTD
CLIENT_OP_CO =	BEACH PETROLEUM N.L.

(Inserted by DNRE - Vic Govt Mines Dept)

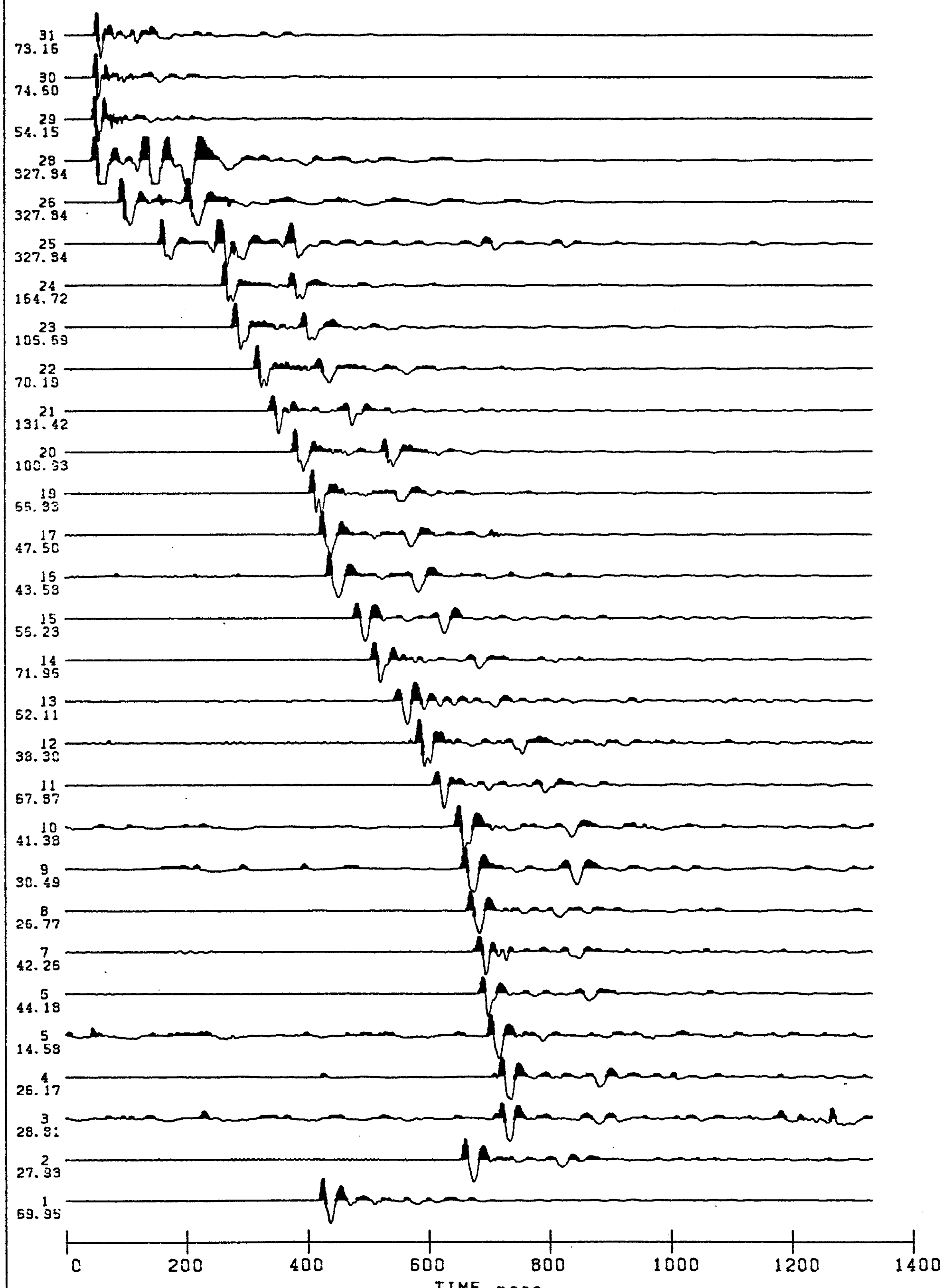
PE905712

This is an enclosure indicator page.
The enclosure PE905712 is enclosed within the container PE902189 at this location in this document.

The enclosure PE905712 has the following characteristics:

ITEM_BARCODE =	PE905712
CONTAINER_BARCODE =	PE902189
NAME =	Velocity Data Table
BASIN =	OTWAY
PERMIT =	PEP/104
TYPE =	WELL
SUBTYPE =	VELOCITY_CHART
DESCRIPTION =	Velocity Data Table, Sonic drift, (from appendix 5 of WCR) for Calista-1
REMARKS =	
DATE_CREATED =	6/04/88
DATE_RECEIVED =	
W_NO =	W972
WELL_NAME =	CALISTA-1
CONTRACTOR =	VELOCITY DATA PTY LTD
CLIENT_OP_CO =	BEACH PETROLEUM N.L.

(Inserted by DNRE - Vic Govt Mines Dept)



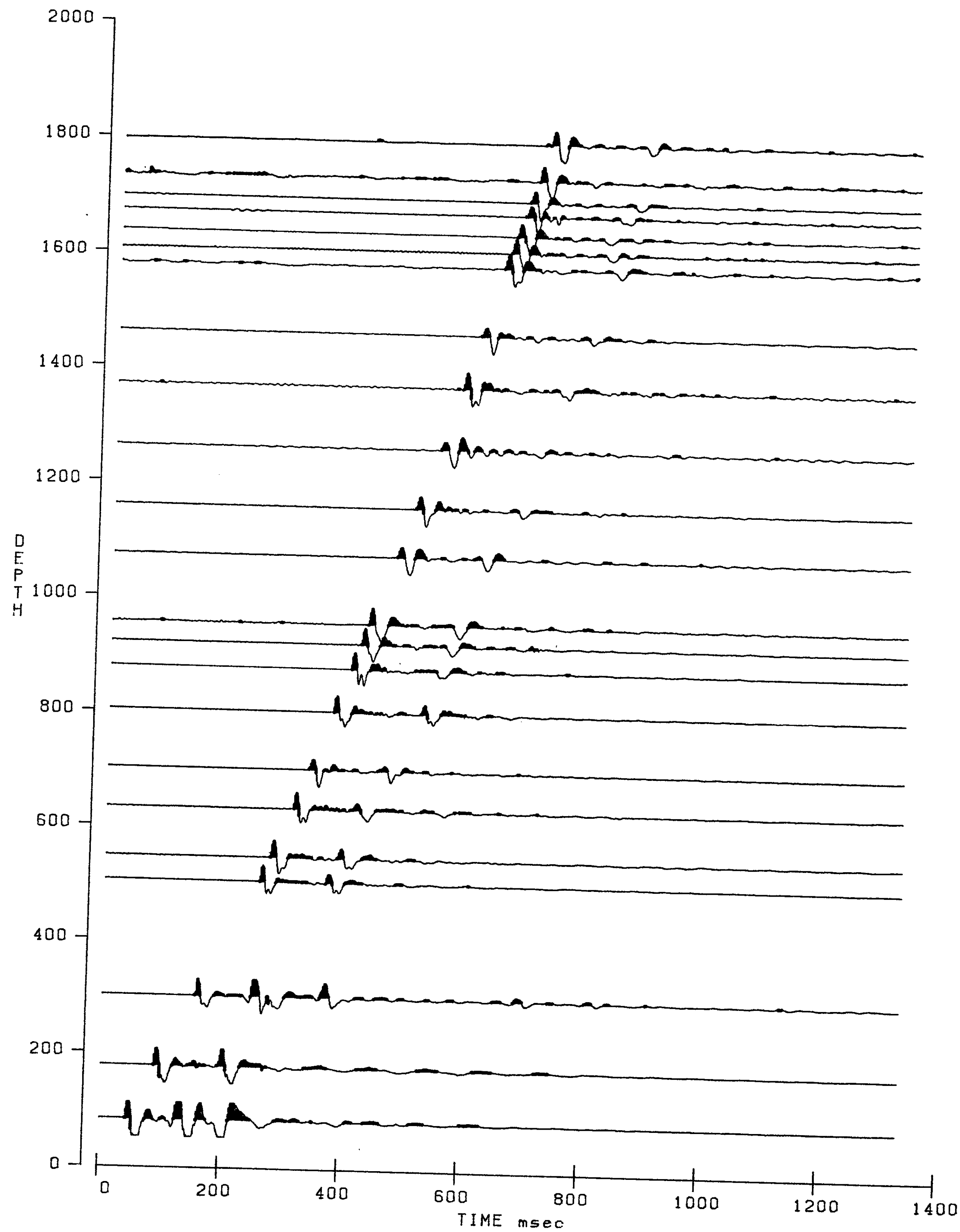
CALISTA #1

VELOCITY SURVEY TRACE DISPLAY

Filter OUT-OUT

No gain recovery

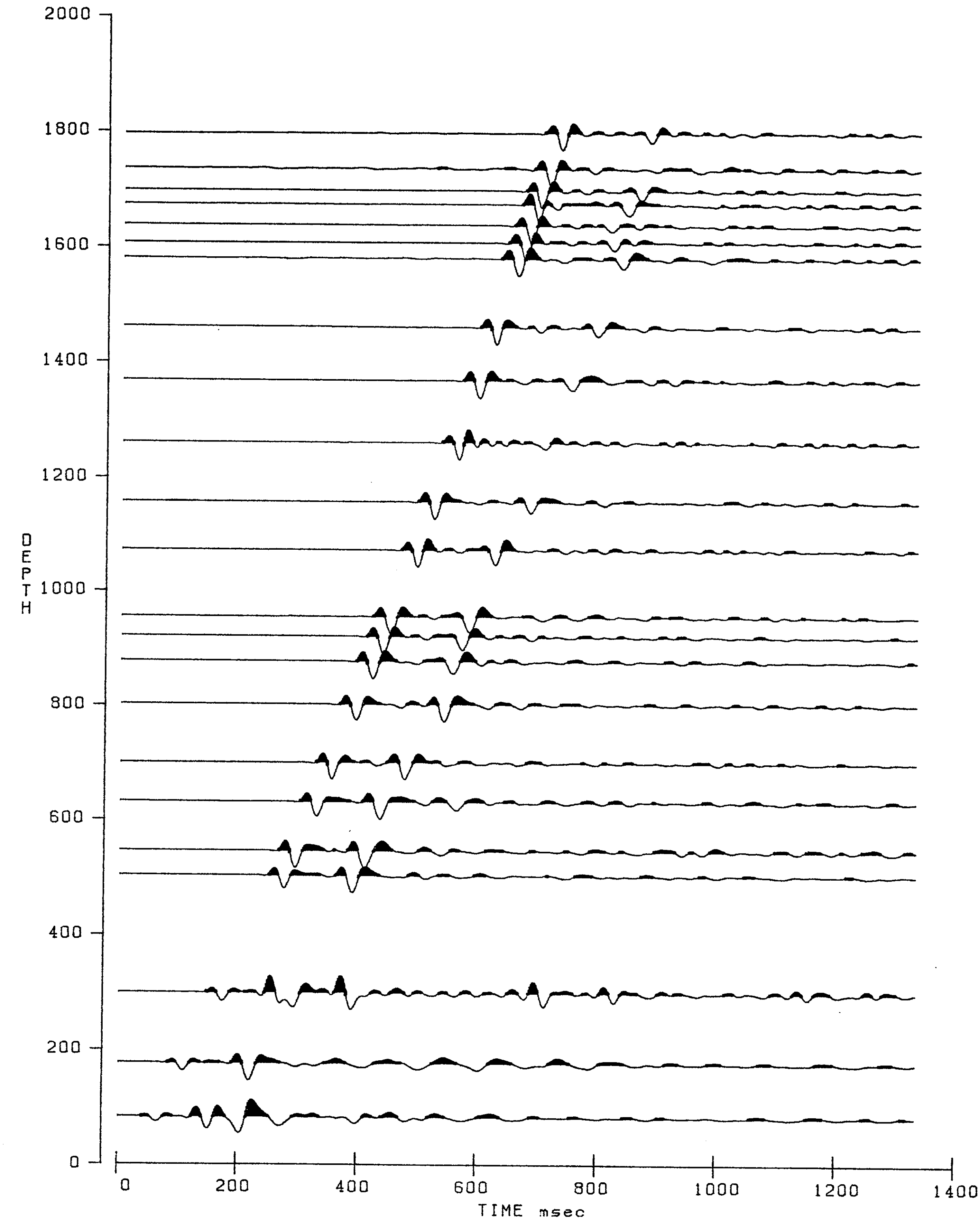
Figure 4A



CALISTA #1

VELOCITY SURVEY TRACE DISPLAY
Filter OUT-OUT
No gain recovery

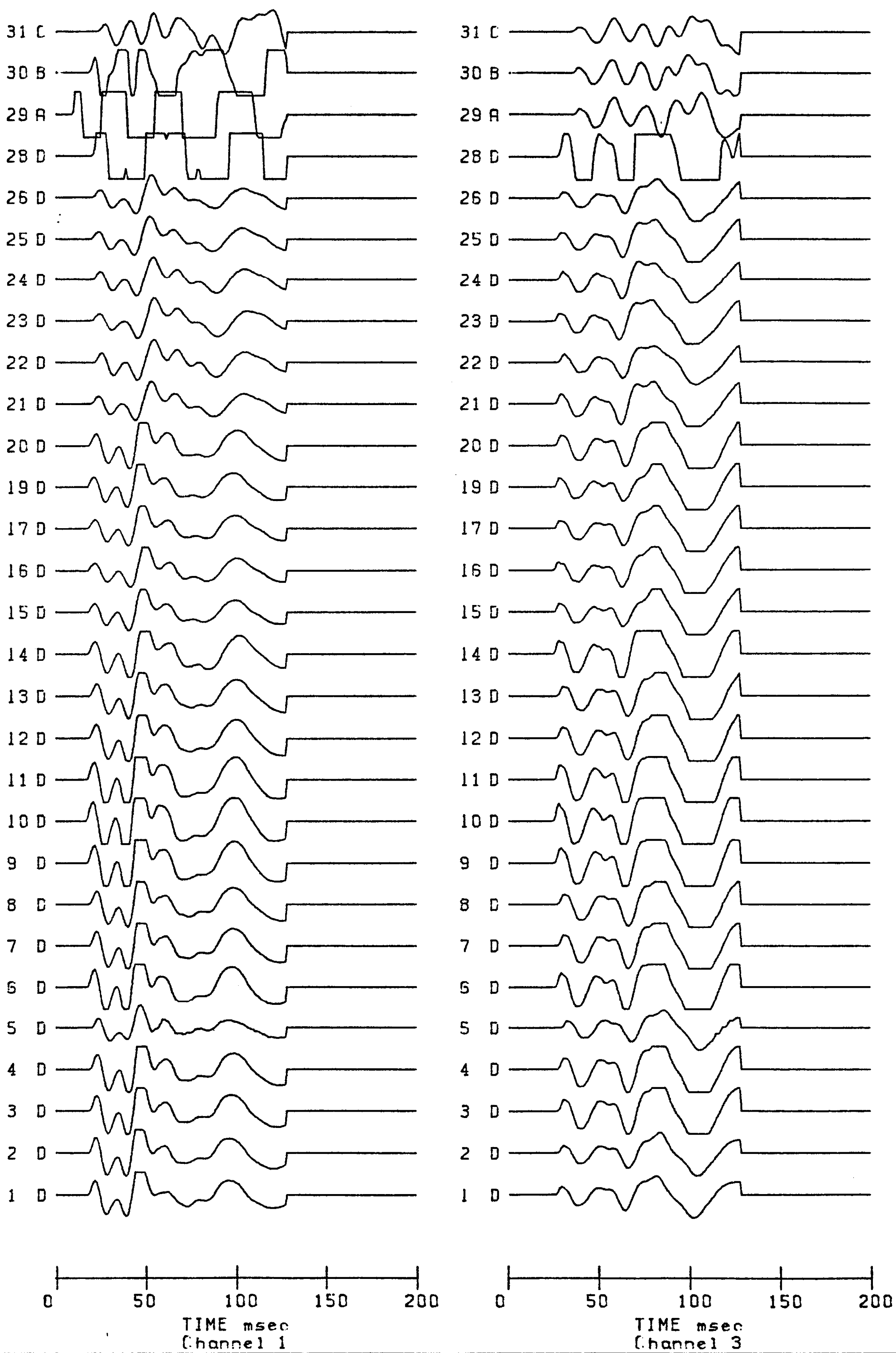
Figure 4B



CALISTA #1

VELOCITY SURVEY TRACE DISPLAY
Filter 5-40
Gain $T^{2.0}$

Figure 4C



CALISTA #1

VELOCITY SURVEY TRACE DISPLAY

Auxiliary channels

Filter OUT-OUT

Figure 4D

TABLE 1. Time-Depth curve values

Well : CALISTA #1
Survey units : METRES
Calibrated sonic interval velocities used from 430.0 to 1715.0

Client : BEACH PETROLEUM N. L.
Datum : 0.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval	Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
5.0	2.4	2079	2079	2079	205.0	106.3	1929	1931	1856
10.0	4.8	2063	2063	2048	210.0	108.9	1928	1930	1863
15.0	7.3	2054	2054	2035	215.0	111.6	1927	1928	1881
20.0	9.8	2047	2048	2029	220.0	114.2	1926	1928	1919
25.0	12.2	2043	2043	2026	225.0	116.8	1927	1929	1955
30.0	14.7	2040	2040	2025	230.0	119.3	1928	1930	1972
35.0	17.2	2038	2038	2025	235.0	121.8	1929	1931	1979
40.0	19.6	2036	2036	2025	240.0	124.3	1930	1932	1982
45.0	22.1	2035	2035	2025	245.0	126.9	1931	1933	1984
50.0	24.6	2034	2034	2025	250.0	129.4	1932	1934	1984
55.0	27.1	2033	2033	2024	255.0	131.9	1933	1935	1985
60.0	29.5	2032	2032	2024	260.0	134.4	1934	1936	1985
65.0	32.0	2032	2032	2024	265.0	136.9	1935	1937	1985
70.0	34.5	2031	2031	2024	270.0	139.5	1936	1938	1985
75.0	36.9	2031	2031	2022	275.0	142.0	1937	1938	1985
80.0	39.4	2030	2030	2019	280.0	144.5	1938	1939	1985
85.0	41.9	2029	2029	2012	285.0	147.0	1938	1940	1985
90.0	44.4	2027	2027	1996	290.0	149.5	1939	1941	1985
95.0	47.0	2023	2023	1961	295.0	152.1	1940	1942	1985
100.0	49.6	2017	2017	1905	300.0	154.6	1941	1942	1985
105.0	52.2	2010	2010	1874	305.0	157.1	1941	1943	1985
110.0	54.9	2002	2003	1860	310.0	159.6	1942	1944	1985
115.0	57.6	1996	1996	1855	315.0	162.1	1943	1944	1985
120.0	60.3	1989	1990	1852	320.0	164.7	1943	1945	1985
125.0	63.0	1983	1984	1851	325.0	167.2	1944	1945	1985
130.0	65.7	1978	1979	1850	330.0	169.7	1945	1946	1985
135.0	68.4	1973	1974	1850	335.0	172.2	1945	1947	1985
140.0	71.1	1968	1970	1850	340.0	174.7	1946	1947	1985
145.0	73.8	1964	1965	1850	345.0	177.3	1946	1948	1985
150.0	76.5	1960	1961	1850	350.0	179.8	1947	1948	1985
155.0	79.2	1956	1958	1850	355.0	182.3	1947	1949	1985
160.0	81.9	1952	1954	1850	360.0	184.8	1948	1949	1985
165.0	84.6	1949	1951	1850	365.0	187.3	1948	1950	1985
170.0	87.4	1946	1948	1850	370.0	189.8	1949	1950	1985
175.0	90.1	1943	1945	1850	375.0	192.4	1949	1951	1985
180.0	92.8	1941	1942	1850	380.0	194.9	1950	1951	1985
185.0	95.5	1938	1940	1850	385.0	197.4	1950	1952	1985
190.0	98.2	1936	1937	1851	390.0	199.9	1951	1952	1986
195.0	100.9	1933	1935	1851	395.0	202.4	1951	1952	1987
200.0	103.6	1931	1933	1853	400.0	205.0	1952	1953	1989

TABLE 1. Time-Depth curve values

Well : CALISTA #1 Client : BEACH PETROLEUM N. L.
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 430.0 to 1715.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
405.0	207.5	1952	1953	1995	605.0	287.4	2105	2124	2615
410.0	209.9	1953	1954	2009	610.0	289.1	2110	2130	2986
415.0	212.4	1954	1955	2042	615.0	291.0	2113	2134	2656
420.0	214.8	1956	1957	2121	620.0	292.9	2117	2137	2619
425.0	216.7	1962	1964	2613	625.0	295.0	2119	2139	2393
430.0	218.6	1967	1970	2618	630.0	297.0	2121	2141	2454
435.0	220.6	1972	1976	2510	635.0	299.0	2124	2145	2569
440.0	222.7	1976	1980	2371	640.0	301.2	2125	2146	2277
445.0	224.7	1980	1985	2446	645.0	303.2	2127	2148	2485
450.0	226.8	1985	1990	2458	650.0	305.3	2129	2150	2387
455.0	228.9	1988	1993	2378	655.0	307.1	2133	2154	2743
460.0	230.7	1994	2000	2694	660.0	309.2	2135	2155	2378
465.0	232.8	1997	2004	2397	665.0	311.3	2136	2157	2423
470.0	234.4	2005	2013	3080	670.0	313.0	2140	2162	2858
475.0	236.4	2009	2018	2503	675.0	315.1	2142	2163	2350
480.0	238.4	2013	2022	2476	680.0	317.5	2142	2163	2149
485.0	240.5	2017	2027	2487	685.0	319.4	2145	2166	2592
490.0	242.4	2021	2031	2524	690.0	321.5	2146	2167	2347
495.0	244.4	2025	2035	2480	695.0	323.5	2148	2169	2490
500.0	246.5	2029	2039	2481	700.0	325.5	2150	2171	2497
505.0	248.5	2032	2043	2463	705.0	327.5	2153	2174	2555
510.0	250.4	2037	2048	2660	710.0	328.8	2159	2183	3763
515.0	252.3	2041	2053	2536	715.0	330.5	2164	2188	3024
520.0	254.3	2045	2057	2557	720.0	331.6	2171	2200	4557
525.0	256.3	2048	2061	2464	725.0	333.5	2174	2202	2590
530.0	258.4	2051	2064	2473	730.0	335.5	2176	2204	2544
535.0	260.5	2054	2067	2352	735.0	337.4	2179	2207	2612
540.0	262.8	2054	2067	2116	740.0	339.3	2181	2209	2558
545.0	265.2	2055	2067	2089	745.0	341.4	2182	2211	2472
550.0	267.3	2057	2070	2384	750.0	343.7	2182	2210	2142
555.0	269.0	2063	2077	3006	755.0	345.6	2185	2213	2651
560.0	270.6	2069	2084	3050	760.0	347.5	2187	2215	2566
565.0	272.5	2074	2089	2739	765.0	349.3	2190	2219	2845
570.0	274.2	2079	2095	2855	770.0	351.1	2193	2221	2700
575.0	275.9	2084	2101	2885	775.0	353.1	2195	2224	2590
580.0	277.9	2087	2105	2581	780.0	355.1	2197	2225	2511
585.0	279.7	2091	2109	2685	785.0	356.9	2199	2228	2668
590.0	281.6	2095	2113	2668	790.0	358.8	2202	2230	2671
595.0	283.7	2098	2116	2439	795.0	360.8	2203	2232	2459
600.0	285.5	2101	2120	2690	800.0	362.8	2205	2234	2572

Well : CALISTA #1
Survey units : METRES
Client : BEACH PETROLEUM N. L.
Datum : 0.0
Calibrated sonic interval velocities used from 430.0 to 1715.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
805.0	364.6	2208	2237	2825	1005.0	438.0	2294	2326	2837
810.0	366.3	2211	2240	2886	1010.0	439.8	2296	2328	2818
815.0	368.1	2214	2244	2833	1015.0	441.6	2298	2330	2778
820.0	370.0	2216	2246	2579	1020.0	443.2	2301	2333	3040
825.0	371.9	2218	2248	2617	1025.0	445.0	2304	2336	2929
830.0	373.9	2220	2249	2554	1030.0	446.5	2307	2340	3285
835.0	375.8	2222	2251	2640	1035.0	448.2	2309	2342	2941
840.0	377.6	2225	2254	2754	1040.0	449.9	2312	2345	2897
845.0	379.2	2228	2258	2999	1045.0	451.5	2315	2348	3193
850.0	381.0	2231	2261	2876	1050.0	452.9	2318	2353	3491
855.0	382.6	2235	2265	3017	1055.0	454.7	2320	2354	2743
860.0	384.3	2238	2268	2926	1060.0	456.4	2322	2357	2953
865.0	386.1	2240	2271	2802	1065.0	458.2	2324	2359	2856
870.0	388.0	2242	2273	2643	1070.0	459.9	2326	2361	2835
875.0	389.8	2245	2276	2832	1075.0	461.7	2329	2363	2884
880.0	391.6	2247	2278	2722	1080.0	463.5	2330	2365	2741
885.0	393.4	2249	2281	2742	1085.0	465.3	2332	2366	2735
890.0	395.4	2251	2282	2499	1090.0	467.1	2333	2368	2755
895.0	397.4	2252	2283	2553	1095.0	469.0	2335	2369	2679
900.0	399.3	2254	2285	2600	1100.0	470.8	2337	2371	2827
905.0	401.1	2256	2287	2821	1105.0	472.7	2338	2372	2580
910.0	403.0	2258	2289	2568	1110.0	474.6	2339	2373	2589
915.0	405.0	2259	2290	2543	1115.0	476.6	2340	2374	2592
920.0	407.0	2261	2292	2579	1120.0	478.6	2340	2375	2506
925.0	408.9	2262	2293	2566	1125.0	480.4	2342	2376	2662
930.0	410.7	2264	2295	2788	1130.0	482.3	2343	2377	2681
935.0	412.6	2266	2297	2615	1135.0	484.2	2344	2378	2632
940.0	414.5	2268	2299	2603	1140.0	486.0	2346	2380	2788
945.0	416.4	2269	2300	2675	1145.0	487.9	2347	2381	2678
950.0	418.2	2272	2303	2845	1150.0	489.6	2349	2383	2875
955.0	420.1	2273	2304	2586	1155.0	491.5	2350	2384	2699
960.0	421.9	2275	2306	2698	1160.0	493.4	2351	2385	2622
965.0	423.8	2277	2308	2741	1165.0	495.2	2352	2386	2664
970.0	425.6	2279	2310	2676	1170.0	497.0	2354	2388	2854
975.0	427.3	2282	2313	2916	1175.0	498.7	2356	2390	2873
980.0	429.2	2283	2314	2694	1180.0	500.6	2357	2391	2663
985.0	431.0	2285	2316	2717	1185.0	502.4	2359	2393	2801
990.0	432.7	2288	2319	2949	1190.0	504.0	2361	2395	3074
995.0	434.5	2290	2322	2875	1195.0	505.7	2363	2397	2967
1000.0	436.3	2292	2324	2801	1200.0	507.4	2365	2399	2874

Well : CALISTA #1 Client : BEACH PETROLEUM N. L.
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 430.0 to 1715.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1205.0	509.2	2366	2401	2831	1405.0	573.3	2451	2492	3335
1210.0	511.0	2368	2402	2765	1410.0	574.8	2453	2495	3310
1215.0	512.8	2369	2403	2797	1415.0	576.3	2455	2497	3347
1220.0	514.6	2371	2405	2855	1420.0	577.8	2458	2500	3385
1225.0	516.3	2373	2407	2927	1425.0	579.3	2460	2503	3423
1230.0	518.0	2375	2409	2911	1430.0	580.7	2462	2506	3464
1235.0	519.8	2376	2410	2774	1435.0	582.2	2465	2509	3468
1240.0	521.6	2377	2412	2745	1440.0	583.6	2467	2511	3427
1245.0	523.2	2379	2414	3083	1445.0	585.1	2470	2514	3460
1250.0	524.9	2381	2416	2956	1450.0	586.5	2472	2517	3482
1255.0	526.6	2383	2418	2982	1455.0	588.0	2475	2520	3449
1260.0	528.4	2385	2419	2842	1460.0	589.4	2477	2522	3416
1265.0	530.0	2387	2422	3117	1465.0	590.9	2479	2525	3334
1270.0	531.7	2389	2424	2918	1470.0	592.5	2481	2527	3195
1275.0	533.4	2390	2425	2894	1475.0	594.0	2483	2529	3250
1280.0	535.2	2392	2427	2849	1480.0	595.6	2485	2531	3174
1285.0	536.8	2394	2429	2968	1485.0	597.1	2487	2533	3434
1290.0	538.5	2396	2431	3045	1490.0	598.4	2490	2536	3587
1295.0	539.9	2399	2435	3617	1495.0	600.0	2492	2538	3161
1300.0	541.5	2401	2437	3073	1500.0	601.7	2493	2540	3063
1305.0	543.1	2403	2439	3152	1505.0	603.3	2494	2541	2966
1310.0	544.6	2405	2442	3204	1510.0	605.1	2496	2542	2915
1315.0	546.2	2408	2444	3243	1515.0	606.8	2497	2543	2957
1320.0	547.7	2410	2447	3234	1520.0	608.4	2498	2545	2960
1325.0	549.3	2412	2450	3263	1525.0	610.2	2499	2546	2862
1330.0	550.8	2415	2452	3228	1530.0	611.9	2501	2547	2963
1335.0	552.4	2417	2455	3228	1535.0	613.4	2502	2549	3283
1340.0	553.8	2419	2457	3347	1540.0	614.9	2504	2551	3237
1345.0	555.4	2422	2460	3247	1545.0	616.7	2505	2552	2898
1350.0	556.9	2424	2463	3332	1550.0	618.3	2507	2554	3157
1355.0	558.4	2427	2465	3328	1555.0	620.0	2508	2554	2783
1360.0	559.9	2429	2468	3354	1560.0	621.8	2509	2555	2844
1365.0	561.4	2431	2471	3333	1565.0	623.5	2510	2557	3038
1370.0	562.9	2434	2474	3362	1570.0	624.9	2512	2559	3356
1375.0	564.4	2436	2476	3346	1575.0	626.7	2513	2560	2851
1380.0	565.9	2438	2479	3199	1580.0	628.4	2514	2561	2928
1385.0	567.4	2441	2482	3385	1585.0	630.1	2515	2562	2945
1390.0	568.9	2443	2484	3355	1590.0	631.7	2517	2564	3160
1395.0	570.4	2446	2487	3374	1595.0	633.4	2518	2565	2996
1400.0	571.8	2448	2490	3425	1600.0	635.0	2520	2566	2978

TABLE 1. Time-Depth curve values

Well : CALISTA #1 Client : BEACH PETROLEUM N. L.
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 430.0 to 1715.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1605.0	636.7	2521	2567	2983	1660.0	655.1	2534	2580	3465
1610.0	638.4	2522	2568	2963	1665.0	656.7	2535	2582	3072
1615.0	640.1	2523	2569	2999	1670.0	658.2	2537	2584	3377
1620.0	641.9	2524	2570	2728	1675.0	659.8	2539	2585	3063
1625.0	643.4	2526	2572	3370	1680.0	661.5	2540	2586	2940
1630.0	645.1	2527	2573	2837	1685.0	663.2	2541	2587	3028
1635.0	646.8	2528	2574	3024	1690.0	664.8	2542	2588	3081
1640.0	648.5	2529	2575	2899	1695.0	666.4	2543	2590	3091
1645.0	650.3	2530	2576	2875	1700.0	668.1	2545	2591	3037
1650.0	652.0	2531	2577	2825	1705.0	669.7	2546	2592	3082
1655.0	653.7	2532	2578	3074	1710.0	671.4	2547	2593	2955

PE905713

This is an enclosure indicator page.
The enclosure PE905713 is enclosed within the container PE902189 at this location in this document.

The enclosure PE905713 has the following characteristics:

ITEM_BARCODE =	PE905713
CONTAINER_BARCODE =	PE902189
NAME =	One Way Time Graph
BASIN =	OTWAY
PERMIT =	PEP/104
TYPE =	WELL
SUBTYPE =	VELOCITY_CHART
DESCRIPTION =	One Way Time Graph (from appendix 5 of WCR) for Calista-1
REMARKS =	
DATE_CREATED =	5/04/88
DATE_RECEIVED =	
W_NO =	W972
WELL_NAME =	CALISTA-1
CONTRACTOR =	VELOCITY DATA PTY LTD
CLIENT_OP_CO =	BEACH PETROLEUM N.L.

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 6

Palynology

PALYNOLOGY OF BEACH CALLISTA-1,

OTWAY BASIN, VICTORIA

BY

ROGER MORGAN

FOR BEACH PETROLEUM

AUGUST, 1988.

PALYNOLOGY OF BEACH CALLISTA-1,

OTWAY BASIN, VICTORIA

BY

ROGER MORGAN

CONTENTS | PAGE

I SUMMARY

930-40m (cuts) : L. balmei Zone : Paleocene : nearshore marine : immature

940-70m (cutts) : T. longus Zone (M. druggii Dinoflagellate Zone) : Maastrichtian : nearshore marine : immature

1665-1715m (swcs) : lower C. triplex Zone : Turonian : nearshore to offshore marine : immature

1734m (swc) : A. distocarinatus Zone : Cenomanian : nearshore marine : immature

1788m (swc) : Indeterminate : apparently non-marine and therefore probably Eumeralla equivalent : marginally mature

II INTRODUCTION

Andrew Buffin of Beach Petroleum submitted 5 swc samples and 4 cuttings samples from Callista-1 for palynological analysis for the completion report.

Palynomorph occurrence data are shown as AppendiX I and form the basis for the assignment of the samples to four spore-pollen units of probably late Albian to Paleocene age. The Tertiary spore-pollen zonation is that of Stover and Evans (1973) and Stover and Partridge (1973) as modified by Partridge (1976) and shown on figure 1. the zones of Harris (1965) are not preferred as they only span part of the interval and are less widely used. The Cretaceous spore-pollen zonation is essentially that of Playford and Dettmann (1969), but has been significantly modified and improved by various authors since, and most recently discussed in Helby et. al. (1987), as shown on figure 1.

No formal dinoflagellate zonation has been published for the Tertiary of the Bass or Gippsland basins although Harris (1985) has recently published some zones for part of the Eocene of the Otway and St. Vincent Basins. Partridge (1976) published a table showing zone names in the Gippsland Basin but charts defining these zones were never published, although they are informally available. Cretaceous dinoflagellate zones are those of Helby, Morgan and Partridge (1987).

Maturity data was generated in the form of Spore Colour Index, and is plotted on figure 2 Maturity profile of Beach Callista-1. The oil and gas windows on figure 2 follow the general concensus of geochemical literature. The oil window corresponds to spore colours of light-mid brown (Staplin

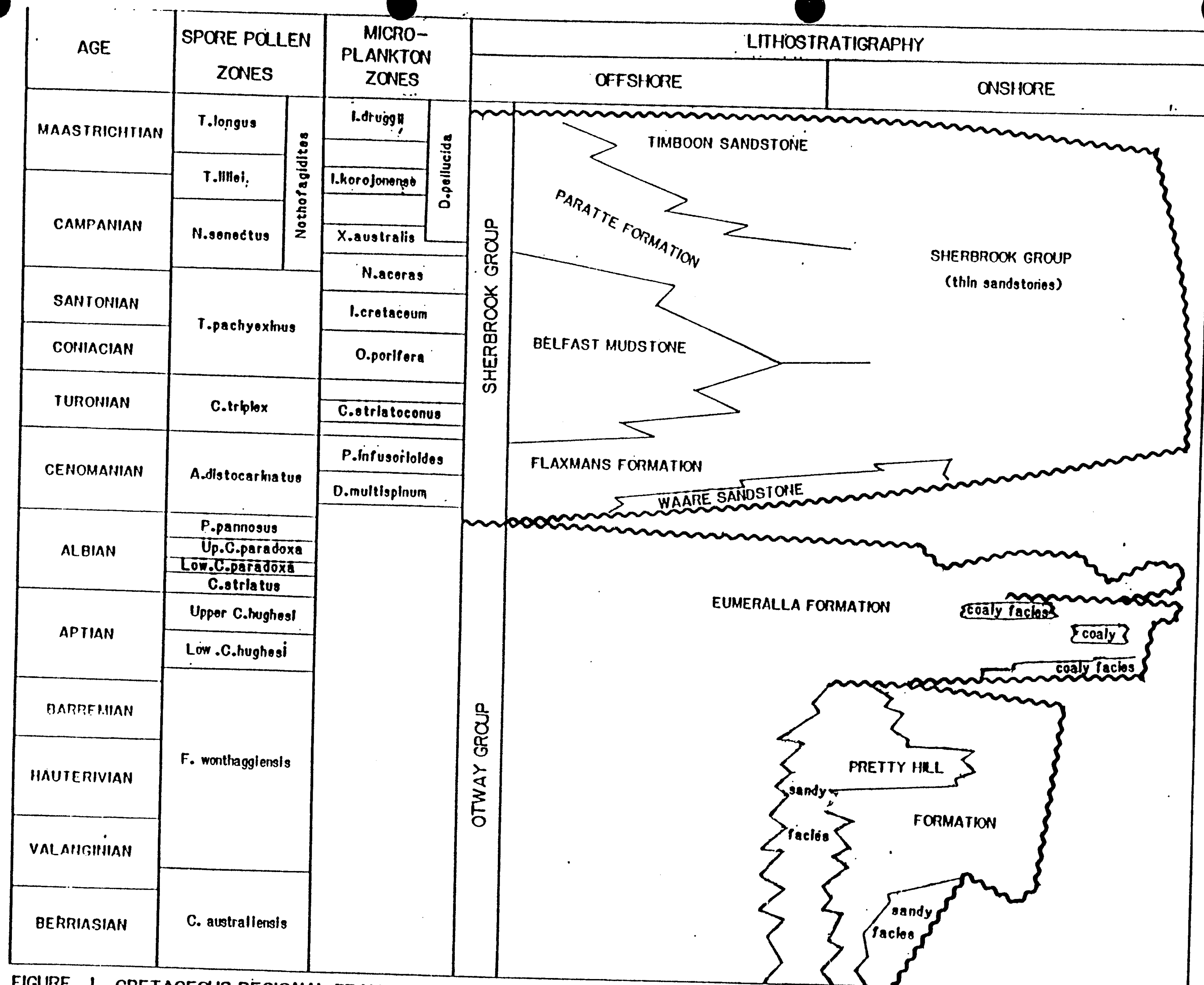


FIGURE 1. CRETACEOUS REGIONAL FRAMEWORK, OTWAY BASIN

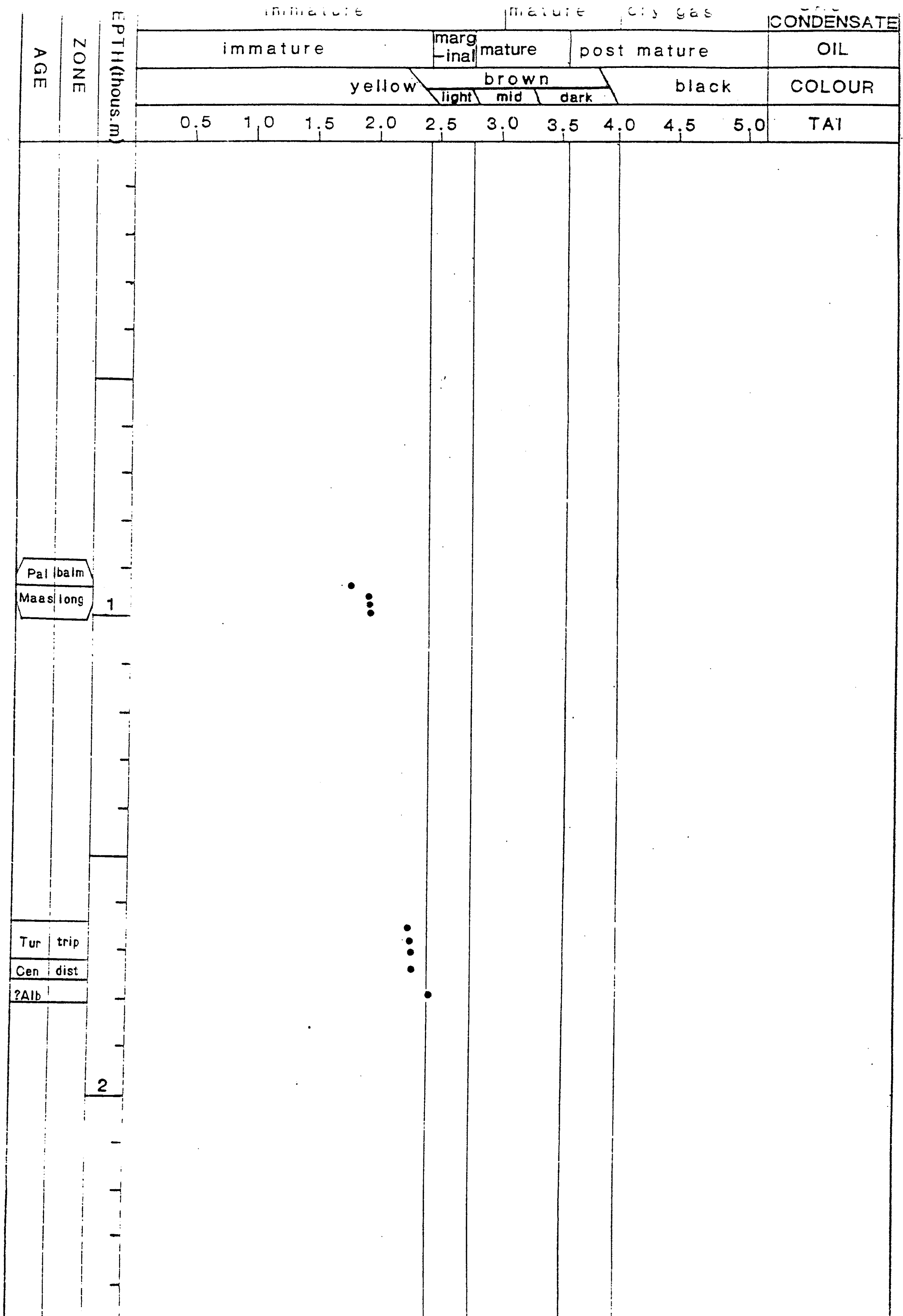


FIGURE 2 MATURITY PROFILE, CALLISTA 1

Spore Colour Index 2.7) to dark brown (3.6). These correspond to vitrinite reflectance values of 0.6% to 1.3%. Geochemists, however, have not reached universal agreement on these values, and argue variations of kerogen type, basin type and even basin history. The maturity interpretation is therefore open to reinterpretation using the spore colours as basic data. However, the range in interpretation philosophies is not great, and probably would not move the oil window by more than 200 metres.

III PALYNOSTRATIGRAPHY

A. 930-40m (cutts) : L. balmei Zone

The presence of Gambierina rudata and Lygistepollenites balmei without older taxa, indicates assignment to the L. balmei Zone of Paleocene age. Proteacidites spp. are dominant, with frequent Cyathidites spp. Downhole caving is clearly present, with taxa such as Triporopollenites ambiguus and Nothofagidites falcatus seen. In view of these, the upper L. balmei indicators (Proteacidites grandis and P. incurvatus) may also be caved and so are disregarded.

Dinoflagellates are rare, but include Deflandrea speciosa, indicating a general Paleocene age.

The dominance of diverse spores and pollen, and scarcity of low diverstiy dinoflagellates, indicates very nearshore marine environments.

Colourless to yellow palynomorphs indicate immaturity for hydrocarbons.

B. 940-70m (cutts) : T. longus Zone

Assignment to the Tricolpites longus Zone is clearly indicated at the top by youngest T. longus, a downhole influx of Gambierina rudata, youngest Triporopollenites sectilis (950-60m) and Tricolporites lillei (960-70m), and confirmed by the dinoflagellates. At the base, oldest T. longus and Stereisporites punctatus indicate the zone, confirmed by the dinoflagellates. Proteacidites spp. are dominant, with frequent

Cyathidites spp. Minor Eocene caving was seen. In the cuttings sample at 940-50m, approximately equal proportions of Paleocene and Maastrichtian are seen. The unconformity therefore probably occurs in that interval.

Dinoflagellates are rare, but include Canninginopsis bretonica and Manumiella conorata, clearly indicating the M. druggii Dinoflagellate Zone, correlative with the upper T. longus Zone. Assemblages are of low diversity, but include taxa such as Alisocysta circumtabulata, Manumiella spp., Isabelidinium spp. and Areoligera senonensis.

Dominance of spores and pollen and scarcity of low diversity dinoflagellates, indicate nearshore marine environments. These assemblages can also be distinguished from the Paleocene above by high inertinite content.

Yellow spore colours indicate immaturity for hydrocarbon generation.

The T. lillei to upper C. triplex Zones are probably present but unsampled in this interval.

C. 1665m (swc)-1715m (swc) : lower C. triplex Zone

Assignment to the lower half of the Clavifera triplex Zone (=P. mawsonii Zone) is indicated at the top by youngest Appendicisporites distocarinatus and at the base by oldest Phyllocladidites mawsonii. Oldest P. eunuchus (1715m) and Clavifera triplex (1689m) confirm the assignment, as do the dinoflagellates. Common taxa include Cyathidites spp., Falcisporites spp., and Microcachryidites antarcticus. Minor Triassic reworking was seen at 1689m only.

Dinoflagellates are fairly frequent and include consistent Cribroperidinium edwardsii up to 1689m. This event normally occurs within the lower C. triplex Zone, equivalent to a point near the top of the P. infusorioides Dinoflagellate Zone.

Dominant and diverse spores and pollen occur, with increasing dinoflagellate content upwards (2% at 1715m, 25% at 1689m, 50% at 1665m) reflecting transgression. Environments therefore range from very nearshore at the base to offshore at the top.

Yellow to yellow/brown spore colours indicate immaturity for hydrocarbons.

D. 1734m (swc) : A. distocarinatus Zone

Assignment to the Appendicisporites distocarinatus Zone is indicated by the presence of A. distocarinatus (and A. tricornitatus) without younger or older indicators. A downhole influx of Foraminisporis spp. (F. asymmetricus, F. dailyi and F. wonthaggiensis) is consistent with assignment. Cyathidites spp. are frequent.

Dinoflagellates are of low diversity and generally longranging, but do include Xenascus asperatus. This is consistent with the X. asperatus to P. infusorioides Zones. Circulodinium deflandrei is easily the most common species.

Nearshore marine environments are indicated by the dinoflagellate content (25%) and their low diversity (10 species), amongst the dominant and diverse spores and pollen.

Yellow to yellow/brown spore colours indicate immaturity for hydrocarbon generation.

E. 1788m (swc) : Indeterminate

An extremely sparse palynomorph assemblage was seen, comprising entirely longranging spores and pollen. the probably non-marine environments therefore suggest the non-marine Eumeralla Formation, and so an Early Cretaceous age. The fossils seen are insufficient to definitively confirm this deduction. Rare Botryococcus suggests some freshwater influence.

Yellow/brown spore colours indicate marginal maturity for oil generation, and immaturity for gas/condensate.

IV CONCLUSIONS

A. Palynology suggests two unconformities. The terminal Cretaceous hiatus probably occurs in the interval 940-50m. The middle Cretaceous hiatus may occur in the gap 1734-1788m.

B. The lower C. triplex interval shows a normal environmental pattern of transgression in time. The top common C. edwardsii may be useful for detailed correlation within this interval.

C. The unpublished dinoflagellate C. bretonica is seen here for the second time in the Otway Basin. It may be that close sampling near the top of the Cretaceous will show that it is widely distributed. So far it is always associated with the M. druggii Dinoflagellate Zone throughout Australia, and is an excellent marker for the Late Maastrichtian.

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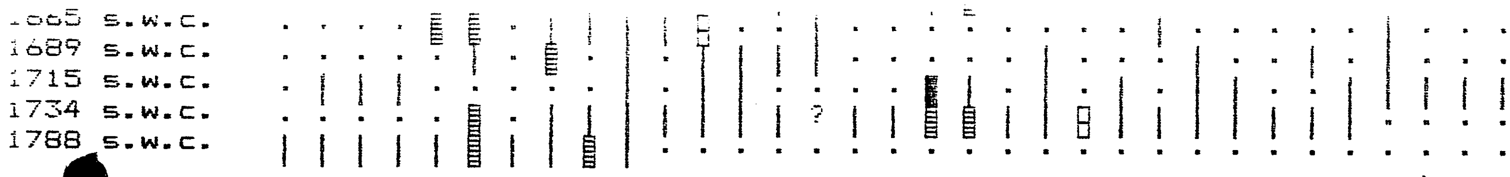
CALLISTA - 1 PALYNOLOGICAL DATA (composite)

RANGE CHART OF GRAPHIC ABUNDANCES BY LOWEST APPEARANCE (By Group)

Key to Symbols

- = Very Rare
- = Rare
- = Few
- = Common
- = Abundant
- ? = Questionably Present
- . = Not Present

No.	Species	[illegible]930-40 cutts
1	ANNULISPORITES	.
2	CALLIALASPORITES DAMPIERI	.
3	CERATOSPORITES EQUALIS	Very Rare
4	COROLLINA TOROSUS	.
5	CYATHIDITES SP.	.
6	FALCISPORITES SIMILIS	.
7	GLEICHINIDITES CIRCINIDITES	Very Rare
8	MICROCACHRYDITES ANTARCTICUS	.
9	OSMUNDACIDITES WELLMANII	Very Rare
10	RETITRILETES AUSTROCLAVATIDITES	.
11	AEQUITRIRADITES TILCHAENSIS	.
12	APPENDICISPORITES DISTOCARINATUS	.
13	APPENDICISPORITES TRICORNITATUS	.
14	CICATRICOSISPORITES AUSTRALIENSIS	.
15	CLAVIFERA TRIPLEX	Very Rare
16	CONTIGNISPORITES COOKSONIAE	.
17	COPTOSPORA SP.A	.
18	CYATHIDITES AUSTRALIS	Very Rare
19	CYATHIDITES MINOR	Few
20	DENSOISPORITES VELATUS	.
21	DICTYOTOSPORITES SPECIOSUS	.
22	FORAMINISPORIS ASYMMETRICUS	.
23	FORAMINISPORIS DAILYI	.
24	FORAMINISPORIS WONTHAGGIENSIS	.
25	GLEICHENIIDITES	.
26	ISCHYOSPORITES PUNCTATUS	.
27	KLUKISPORITES SCABERIS	.
28	LYCOPODIACIDITES ASPERATUS	.
29	TRIPOROLETES RETICULATUS	.
30	AMOSOPOLLIS CRUCIFORMIS	Very Rare
31	CICATRICOSISPORITES LUDBROOKIAE	.
32	CYCADOPITES FOLLICULARIS	.
33	LEPTOLEPIDITES VERRUCATUS	.


1665 s.w.c.
1689 s.w.c.
1715 s.w.c.
1734 s.w.c.
1788 s.w.c.

34	LYGISTEPOLLENITES FLORINII
35	PEROTRILETES MORGANII/JUBATUS
36	PHYLLOCLADIDITES EUNUCHUS
37	PHYLLOCLADIDITES MAWSONII
38	SESTROSPORITES PSUEDOALVEOLATUS
39	STERIESPORITES ANTIQUASPORITES
40	AUSTRALOPOLLIS OBSCURUS
41	BALMEISPORITES HOLODICTYUS
42	CYCLOSPORITES HUGHESI
43	TRILOBOSPORITES TRIORETICULOSUS
44	CAMEROZONOSPORITES BULLATUS
45	PHIMOPOLLENITES PANNOSUS
46	CINGUTRILETES CLAVUS
47	CUPANEIDITES ORTHOTEICHUS
48	GAMBIERINA RUDATA
49	HALORAGACIDITES HARRISII
50	LATROBOSPORITES OHAIENSIS
51	LYGISTEPOLLENITES BALMEI
52	MALVACIPOLLITES SUBTILIS
53	NOTHOFAGIDITES EMARCIDUS
54	NOTHOFAGIDITES ENDURUS
55	PERIPOROPOLLENITES POLYORATUS
56	PROTEACIDITES SPP.
57	SPINOZONOCOLPITES PROMINATUS
58	STERIESPORITES PUNCTATUS
59	TRICOLPITES LONGUS
60	TRICOLPORITES LILLIEI
61	BEAUPREADITES ELEGANSIFORMIS
62	CAMEROZONOSPORITES OHAIENSIS
63	DACRYCARPIDITES AUSTRALIENSIS
64	GAMBIERINA EDWARDSII
65	HERKOSPORITES ELLIOTTII
66	NOTHOFAGIDITES FALCATUS

0930-40 cutts
0940-50 cutts
0950-60 cutts
0960-70 cutts
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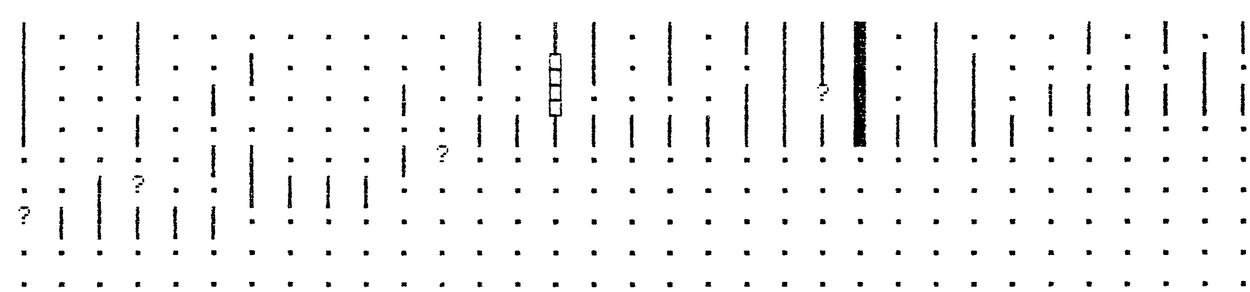
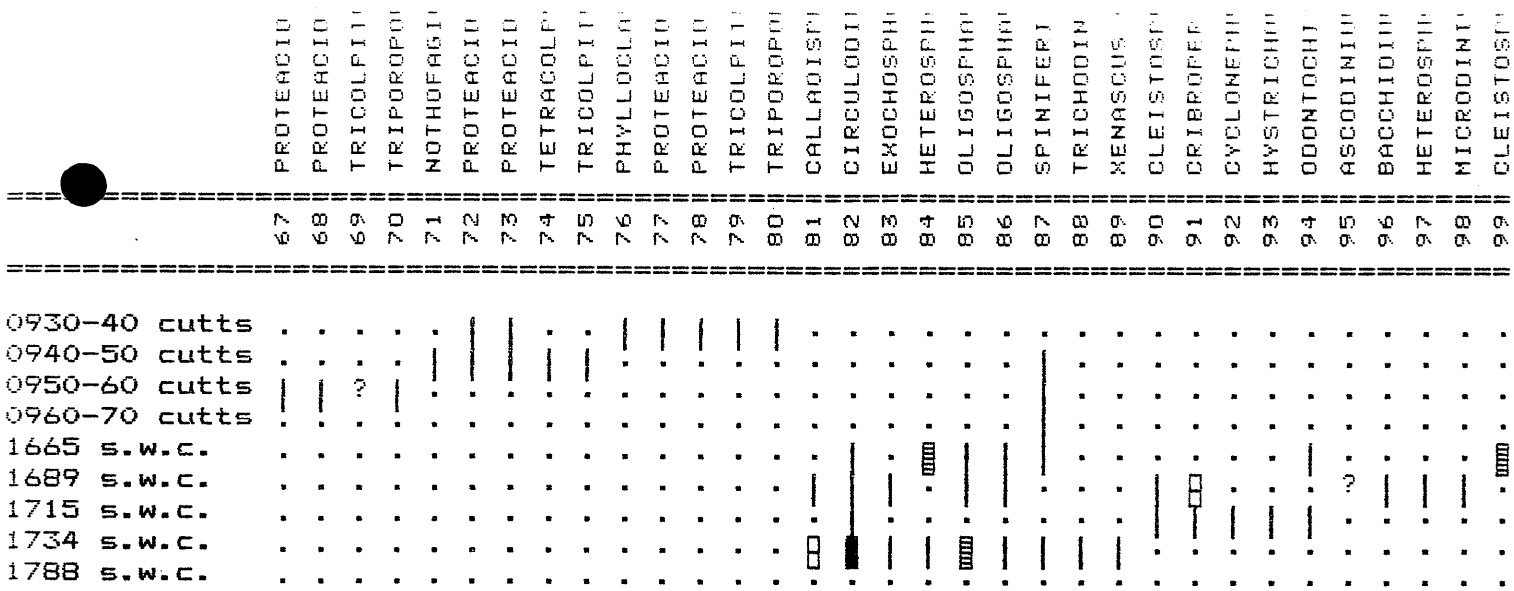
168[illegible] s.w.c.
1715 s.w.c.
1734 s.w.c.
1788 s.w.c.



RASSUS
ALISADUS ss
FESSUS
ES SECTILIS
FLEMINGII
PANDIS
NCURVATUS
DAMARUENSIS
LLIPSII
S VERRUCOSUS
IENANTHOIDES
RESOLABRUS
LII
ES AMBIGUUS
IUM ASYMMETRICUM
EFLANDREI
UM PHRAGMITES
UM HETERACANTHUM
M COMPLEX
M PULCHERRIMUM
RCATUM/RAMOSUS

IUS
IUM HUGUONIOTI
M EDWARDSII
MEMBRANIPHORUM
PULCHRUM
PERCULATA
UM
PES
UM CONJUNCTUM
IATUM
IUM SP.



PROTEACID 67
PROTEACID 68
TRICOLPIT 69
TRIPOROPO 70
NOTHOFAGI 71
PROTEACID 72
PROTEACID 73
TETRACOLP 74
TRICOLPIT 75
PHYLLOCLA 76
PROTEACID 77
PROTEACID 78
TRICOLPIT 79
TRIPOROPO 80
CALLAOISP 81
CIRCULODI 82
EXOCHOSPH 83
HETEROSPH 84
OLIGOSPHA 85
OLIGOSPHA 86
SPINIFERI 87
TRICHODIN 88
XENASCUS 89
CLEISTOSP 90
CRIBROPER 91
CYCLONEPH 92
HYSTRICHO 93
ODONTOCHI 94
ASCODINIU 95
BACCHIDIN 96
HETEROSPH 97
MICRODINI 98
CLEISTOSP 99
0930-40 cutts
0940-50 cutts
0950-60 cutts
0960-70 cutts
1665 s.w.c.
1689 s.w.c.
1715 s.w.c.
1734 s.w.c.
1788 s.w.c.
?
?

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

INDEX NUMBER	SPECIES
11	AEQUITRIRADITES TILCHAENSIS
105	ALISOCYSTA CIRCUMTABULATA
10	ALISOCYSTA MARGARITA
100	ALTERBIA ACUTULA
30	AMOSOPOLLIS CRUCIFORMIS
1	ANNULISPORITES
12	APPENDICISPORITES DISTOCARINATUS
[illegible]	[illegible]

	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	
	ALTERBIA ACUTULA	CANNINGINOPSIS BRETONICA	CIRCULODINIUM ATTADALICUM	MANUMIELLA CORONATA	MANUMIELLA DRUGGII	ALISOCYSTA CIRCUMTABULATA	ALISOCYSTA MARGARITA	AREOLIGERA SENONENSIS	ISABELDINIUM KOROJONENSE	PALAEOPERIDINIUM PYROPHORUM	DEFLANDREA HETEROPHLYCTA	DEFLANDREA SPECIOSA	ISABELIDINIUM PELLUCUDUM	OPERCULODINIUM CENTROCARPUM	APTEODINIUM GRANULATUM	SPINIDINIUM SP.	BOTRYOCOCCUS	SCHIZOSPORIS RETICULATA	PARALECANIELLA INDENTATA	
0930-40 cutts	.	.	.	.	.	.	.	.	.	.	.	|	.	|	|	|	.	.	.	0930-40 cutts
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1715 s.w.c.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1715 s.w.c.
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[illegible]	[illegible]
40	AUSTRALOPOLLIS OBSCURUS
96	BACCHIDIUM POLYPES
41	BALMEISPORITES HOLODICTYUS
61	BEAUPREADITES ELEGANSIFORMIS
11[illegible]	BOTRYOCOCCUS
8[illegible]	CALLAOISPHAERIDIUM ASYMMETRICUM
2	CALLIALASPORITES DAMPIERI
44	CAMEROZONOSPORITES BULLATUS
62	CAMEROZONOSPORITES OHAIENSIS
101	CANNINGINOPSIS BRETONICA
3	CERATOSPORITES EQUALIS
14	CICATRICOSISPORITES AUSTRALIENSIS
31	CICATRICOSISPORITES LUDBROOKIAE
46	CINGUTRILETES CLAVUS
102	CIRCULODINIUM ATTADALICUM
82	CIRCULODINIUM DEFLANDREI
15	CLAVIFERA TRIPLEX
90	CLEISTOSPHAERIDIUM HUGUONIOTI
99	CLEISTOSPHAERIDIUM SP.
16	CONTIGNISPORITES COOKSONIAE
17	COPTOSPORA SP.A
4	COROLLINA TOROSUS
91	CRIBROPERIDINIUM EDWARDSII
4[illegible]	CUPANEIDITES ORTHOTEICHUS
1[illegible]	CYATHIDITES AUSTRALIS
19	CYATHIDITES MINOR
5	CYATHIDITES SP.
32	CYCADOPITES FOLLICULARIS
92	CYCLONEPHELIUM MEMBRANIPHORUM
42	CYCLOSPORITES HUGHESI
63	DACRYCARPIDITES AUSTRALIENSIS
110	DEFLANDREA HETEROPHLYCTA
111	DEFLANDREA SPECIOSA
20	DENSOISPORITES VELATUS
21	DICTYOTOSPORITES SPECIOSUS
83	EXOCHOSPHAERIDIUM PHRAGMITES
6	FALCISPORITES SIMILIS
22	FORAMINISPORIS ASYMMETRICUS
23	FORAMINISPORIS DAILYI
24	FORAMINISPORIS WONTHAGGIENSIS
64	GAMBIERINA EDWARDSII
48	GAMBIERINA RUDATA
2[illegible]	GLEICHENIIDITES
7	GLEICHINIDITES CIRCINIDITES
49	HALORAGACIDITES HARRISII
65	HERKOSPORITES ELLIOTTII
97	HETEROSPHAERIDIUM CONJUNCTUM
84	HETEROSPHAERIDIUM HETERACANTHUM
93	HYSTRICHODINIUM PULCHRUM
108	ISABELDINIUM KOROJONENSE
112	ISABELIDINIUM PELLUCUDUM
26	ISCHYOSPORITES PUNCTATUS
27	KLUKISPORITES SCABERIS
50	LATROBOSPORITES OHAIENSIS
33	LEPTOLEPIDITES VERRUCATUS
28	LYCOPODIACIDITES ASPERATUS
51	LYGISTEPOLLENITES BALMEI
34	LYGISTEPOLLENITES FLORINII
52	MALVACIPOLLITES SUBTILIS
103	MANUMIELLA CORONATA
104	MANUMIELLA DRUGGII
[illegible]	MICROCACHRYDITES ANTARCTICUS
98	MICRODINIUM ORNATUM
53	NOTHOFAGIDITES EMARCIDUS
54	NOTHOFAGIDITES ENDURUS
66	NOTHOFAGIDITES FALCATUS
[illegible]	[illegible]

66 OLIGOSPHAERIDIUM PULCHERRIMUM
113 OPERCULODINIUM CENTROCARPUM
9 OSMUNDACIDITES WELLMANII
109 PALAEOPERIDINIUM PYROPHORUM
118 PARALECANIELLA INDENTATA
55 PERIPOROPOLLENITES POLYORATUS
3[illegible] PEROTRILETES MORGANII/JUBATUS
45 PHIMOPOLLENITES PANNOSUS
36 PHYLLOCLADIDITES EUNUCHUS
37 PHYLLOCLADIDITES MAWSONII
76 PHYLLOCLADIDITES VERRUCOSUS
77 PROTEACIDITES ADENANTHOIDES
67 PROTEACIDITES CRASSUS
72 PROTEACIDITES GRANDIS
73 PROTEACIDITES INCURVATUS
78 PROTEACIDITES OBESOLABRUS
68 PROTEACIDITES PALISADUS ss
56 PROTEACIDITES SPP.
10 RETITRILETES AUSTROCLAVATIDITES
117 SCHIZOSPORIS RETICULATA
38 SESTROSPORITES PSUEDOALVEOLATUS
115 SPINIDINIUM SP.
87 SPINIFERITES FURCATUM/RAMOSUS
57 SPINOZONOCOLPITES PROMINATUS
3[illegible] STERIESPORITES ANTIQUASPORITES
58 STERIESPORITES PUNCTATUS
74 TETRACOLPORITES OAMARUENSIS
88 TRICHODINIUM
69 TRICOLPITES CONFESSUS
79 TRICOLPITES GILLII
59 TRICOLPITES LONGUS
75 TRICOLPITES PHILLIPSII
60 TRICOLPORITES LILLIEI
43 TRILOBOSPORITES TRIORETICULOSUS
29 TRIPOROLETES RETICULATUS
80 TRIPOROPOLLENITES AMBIGUUS
70 TRIPOROPOLLENITES SECTILIS
89 XENASCUS ASPERATUS

APPENDIX 7

X-Ray Diffraction Analysis

Amdel Limited
(Incorporated in S.A.)
31 Flemington Street,
Frewville, S.A. 5063
Telephone: (08) 372 2700

P.O. Box 114,
Eastwood, S.A. 5063
Telex: AA82520
Facsimile: (08) 79 6623

technology and enterprise

21 July 1988

Beach Petroleum NL
Box 7096 GPO
SYDNEY NSW 2001

Attention: Mr A. Buffin

REPORT F 7266 - Part 2 (Final)

YOUR REFERENCE: Letter of 17 June 1988

SAMPLE IDENTIFICATION: 1-8

MATERIAL: SWC

LOCALITY: CALLISTA-1

WORK REQUIRED: X-ray diffraction analysis

Investigation and Report by: Dr Roger N. Brown

Manager, Petroleum Services Section: Dr Brian G. Steveson

for Dr William G. Spencer
General Manager
Applied Sciences Group

cap

1. INTRODUCTION

Eight SWC samples were received from Callista-1 for X-ray diffraction analysis.

2. PROCEDURE

Portion of each sample was powdered finely and used to prepare an X-ray diffractometer trace which was interpreted by standard procedures.

Further, weighed, lightly pre-ground subsamples were taken and dispersed in water with the aid of deflocculants and an electric blender, and allowed to sediment to produce -2 μm e.s.d. size fractions by the pipette method. The resulting dispersions were examined by plummet balance to determine their solids contents, and were then used to produce oriented clay preparations on ceramic plates. Two plates were prepared per sample (when possible), both being saturated with Mg^{++} ions, and one in addition being treated with glycerol. When air-dry, these were examined in the X-ray diffractometer. Additional diagnostic examinations carried out consisted of examination of a glycol-treated plate and then glycerol-free plate after heating for one hour at 550°C.

3. RESULTS

The results are given in Table 1, which lists the following:

(a) The mineralogy of the total sample, as derived from examination of the bulk material, with supporting evidence as available. The minerals found are listed in approximate order of decreasing abundance, using approximate percentage estimates. Bracketed minerals were not detected in the bulk examination but are inferred from the clay fraction.

(b) The proportion of the sample found to separate into the -2 μm size fraction, as determined by the plummet balance. The figure obtained applies only to the pre-treatment and dispersion conditions used.

(c) The mineralogy of the -2 μm fraction, given as in Section (a).

NB: Note that the percentage estimates are approximate figures.

4. REMARKS

Clay in three samples gives diffraction information which appears to originate from a triply-interstratified smectite-chlorite-illite, or at least the pattern is consistent with this interpretation. Interpretation of such clays is difficult and no estimate of the relative abundance of the larger types can be given; nor is there any suitable method for estimating the proportion of such material; an approximate estimate has been made, however.

The uncertain clay X in Core 17 gave such poorly-defined information that no proper assessment of its mineralogy could be made, except to confirm that it has a smectite component.

TABLE 1: MINERALOGY OF 8 CALLISTA-1 SAMPLES

(Figures in approximate percentages*)

	3:1788 m		6:1731 m		11:1694 m		13:1681.5 m	
Bulk Mineralogy:	Q	31	Q	35	Q	30	Q	80
	F	25	(Sm^+)	20	(M^+)	20	K	10
	M	20	C	18	K	18	F'	5
	C	15	M	10	Sid	14	M	4
	(Sm)	8	F	10	M	10	(Sm)	1
	Py?	1	K	7	F'	5		
					Py	3		
<u>-2 µm fraction</u> %:	16		31		26		7	
Mineralogy:	Sm	46	Sm^+	58	M^+	64	K	80
	C	28	C	16	K	24	M	12
	M	15	K	12	M	6	Sm	4
	Q	9	M	9	Q	4	Q	4
	F	3	Q	5	C	2	F'	1

	16:1665 m		17:1616 m		18:1605 m		19:1583 m	
Bulk Mineralogy:	Q	28	(Am?)	50	(Am)	46	Q	30
	(Am?)	25	Q	15	Q	20	(Am)	25
	(TI)	20	Sid	13	(TI)	20	(TI)	25
	K	15	K	10	K	10	K	10
	M	5	F'F	5	M	3	M	5
	F	5	M	4	Py	1	Gy?	3
	Py	2	(X)	3			Py	2
<u>-2 µm fraction</u> %:	25		2		16		22	
Mineralogy:	TI	60	K	44	TI	75	TI	78
	K	33	X	38	K	17	K	15
	M	4	M	16	Q	5	Q	4
	Q	3	Q	3	M	3	M	3

*NB: See text for remarks on quoted percentage figures.

<u>Mineral Key</u>

Am	Probable amorphous material (inferred from weak pattern)
C	Chlorite
F	Feldspar (plagioclase)
F'	K feldspar
Gy	Gypsum
K	Kaolinite
M	Mica/illite
M^+	Illite with minor interstratified smectite (in this instance ~20%)
Py	Pyrite
Q	Quartz
Sid	Siderite
Sm	Smectite
Sm^+	Smectite with minor interstratified illite (in this instance ~30%)
TI	Apparently triply-interstratified smectite-chlorite-illite clay material. See text.
X	Indeterminate smectite-related clay (not properly defined).

APPENDIX 8

Synthetic Seismogram

PE601031

This is an enclosure indicator page.
The enclosure PE601031 is enclosed within the container PE902189 at this location in this document.

The enclosure PE601031 has the following characteristics:

ITEM_BARCODE =	PE601031
CONTAINER_BARCODE =	PE902189
NAME =	Synthetic Seismogram
BASIN =	OTWAY
PERMIT =	PEP 104
TYPE =	WELL
SUBTYPE =	SYNTH_SEISMOGRAM
DESCRIPTION =	Synthetic Seismogram (enclosure from WCR vol.1) for Callista-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	2/11/88
W_NO =	W972
WELL_NAME =	Callista-1
CONTRACTOR =	Digimap Geodata Services
CLIENT_OP_CO =	Beach Petroleum NL

(Inserted by DNRE - Vic Govt Mines Dept)

PETROLEUM DIVI[illegible]ON   02 NOV 1988   Calli[illegible]-1 W.C.R. Vol 1.

SONSUM - WELL SONIC LOG SUMMARY PROGRAM; File : CALL1CSC

Well name = CALLISTA 1

Log type = SONIC(CSC)

THIS LOG HAS BEEN CHECKSHOT CORRECTED.
KB elevation ....= 52.9 metres
SRD elevation ....= 0.0 metres
Replacement velocity ....= 2000.0 metres/s
Time from SRD to top of sonic ..= 0.3100 seconds

2-WAY TIME FROM SRD seconds	DEPTH FROM SRD metres	DEPTH FROM KB metres	INTERVAL VELOCITY metres/s	AVERAGE VELOCITY FROM SRD metres/s	REFLECTIVITY
0.312	248.8	301.7	1622.7	1997.6	0.056247
0.314	250.6	303.5	1816.2	1996.4	-0.032208
0.316	252.3	305.2	1702.8	1994.6	0.009148
0.318	254.1	307.0	1734.3	1992.9	-0.005267
0.320	255.8	308.7	1716.1	1991.2	0.027106
0.322	257.6	310.5	1811.7	1990.1	0.008966
0.324	259.4	312.3	1844.5	1989.2	-0.029665
0.326	261.2	314.1	1738.2	1987.6	0.031306
0.328	263.0	315.9	1850.6	1986.8	-0.016449
0.330	264.8	317.7	1790.7	1985.6	-0.022553
0.332	266.5	319.4	1711.7	1984.0	0.013952
0.334	268.3	321.2	1760.1	1982.6	0.008954
0.336	270.1	323.0	1791.9	1981.5	0.017772
0.338	271.9	324.8	1856.8	1980.8	0.005504
0.340	273.8	326.7	1877.3	1980.2	0.000417
0.342	275.7	328.6	1878.9	1979.6	0.005187
0.344	277.6	330.5	1898.5	1979.1	0.009917
0.346	279.5	332.4	1936.5	1978.8	-0.011646
0.348	281.4	334.3	1891.9	1978.3	-0.017935
0.350	283.2	336.1	1825.3	1977.5	0.018604
0.352	285.1	338.0	1894.5	1977.0	0.007054
0.354	287.0	339.9	1921.4	1976.7	0.008353
0.356	289.0	341.9	1953.8	1976.6	0.005955
0.358	291.0	343.9	1977.2	1976.6	0.003529
0.360	293.0	345.9	1991.2	1976.6	-0.039601
0.362	294.8	347.7	1839.5	1975.9	0.012994
0.364	296.7	349.6	1887.9	1975.4	0.010491
0.366	298.6	351.5	1927.9	1975.1	-0.021388
0.368	300.5	353.4	1847.2	1974.4	-0.016191
0.370	302.3	355.2	1788.3	1973.4	0.019153
0.372	304.1	357.0	1858.2	1972.8	-0.002607
0.374	306.0	358.9	1848.5	1972.2	0.012846
0.376	307.9	360.8	1896.6	1971.8	-0.013384
0.378	309.7	362.6	1846.5	1971.1	-0.002375
0.380	311.5	364.4	1837.8	1970.4	0.013488
0.382	313.4	366.3	1888.0	1970.0	-0.025416
0.384	315.2	368.1	1794.4	1969.0	0.045066
0.386	317.2	370.1	1963.8	1969.0	-0.017597
0.388	319.1	372.0	1895.9	1968.6	0.001896
0.390	321.0	373.9	1903.1	1968.3	-0.028731

0.392	322.8	375.7	1796.8	1967.4	-0.006799
0.394	324.6	377.5	1772.5	1966.4	0.022217
0.396	326.4	379.3	1853.1	1965.9	0.000085
0.398	328.3	381.2	1853.4	1965.3	-0.010954
0.400	330.1	383.0	1813.2	1964.5	0.006664
0.402	331.9	384.8	1837.6	1963.9	0.020430
0.404	333.8	386.7	1914.2	1963.7	-0.005103
0.406	335.7	388.6	1894.8	1963.3	0.029576
0.408	337.7	390.6	2010.3	1963.6	-0.009155
0.410	339.7	392.6	1973.8	1963.6	0.002183
0.412	341.7	394.6	1982.4	1963.7	-0.000568
0.414	343.7	396.6	1980.2	1963.8	0.012827
0.416	345.7	398.6	2031.6	1964.1	0.009488
0.418	347.8	400.7	2070.6	1964.6	-0.014948
0.420	349.8	402.7	2009.6	1964.8	0.003280
0.422	351.8	404.7	2022.8	1965.1	-0.044609
0.424	353.7	406.6	1850.0	1964.6	0.015111
0.426	355.6	408.5	1906.8	1964.3	-0.000588
0.428	357.5	410.4	1904.6	1964.0	0.002997
0.430	359.4	412.3	1916.0	1963.8	0.002510
0.432	361.3	414.2	1925.7	1963.6	-0.007345
0.434	363.2	416.1	1897.6	1963.3	0.003734
0.436	365.1	418.0	1911.8	1963.1	-0.024433
0.438	366.9	419.8	1820.6	1962.4	0.008767
0.440	368.8	421.7	1852.8	1961.9	0.018526
0.442	370.7	423.6	1922.8	1961.7	0.012002
0.444	372.7	425.6	1969.5	1961.8	-0.010064
0.446	374.6	427.5	1930.2	1961.6	0.008700
0.448	376.6	429.5	1964.1	1961.6	-0.010771
0.450	378.5	431.4	1922.2	1961.5	0.008034
0.452	380.5	433.4	1953.4	1961.4	-0.003768
0.454	382.4	435.3	1938.7	1961.3	0.010241
0.456	384.4	437.3	1978.8	1961.4	-0.000134
0.458	386.4	439.3	1978.3	1961.5	-0.005942
0.460	388.3	441.2	1954.9	1961.5	0.021959
0.462	390.4	443.3	2042.7	1961.8	-0.025465
0.464	392.3	445.2	1941.3	1961.7	0.013856
0.466	394.3	447.2	1995.8	1961.9	-0.010620
0.468	396.2	449.1	1953.9	1961.8	0.005741
0.470	398.2	451.1	1976.4	1961.9	-0.003088
0.472	400.2	453.1	1964.3	1961.9	-0.002872
0.474	402.1	455.0	1953.0	1961.9	-0.029528
0.476	404.0	456.9	1841.0	1961.4	0.005080
0.478	405.8	458.7	1859.8	1960.9	0.000988
0.480	407.7	460.6	1863.5	1960.5	-0.001003
0.482	409.6	462.5	1859.7	1960.1	0.001490
0.484	411.4	464.3	1865.3	1959.7	-0.002396
0.486	413.3	466.2	1856.4	1959.3	-0.001823
0.488	415.1	468.0	1849.6	1958.8	0.028626
0.490	417.1	470.0	1958.6	1958.8	-0.045780
0.492	418.9	471.8	1787.1	1958.1	0.039591
0.494	420.8	473.7	1934.5	1958.0	0.058702
0.496	423.0	475.9	2175.8	1958.9	0.006422
0.498	425.2	478.1	2203.9	1959.9	-0.056860
0.500	427.2	480.1	1966.7	1959.9	0.012262
0.502	429.2	482.1	2015.6	1960.2	0.020096
0.504	431.3	484.2	2098.3	1960.7	-0.036440
0.506	433.2	486.1	1950.7	1960.7	0.106300
0.508	435.6	488.5	2414.8	1962.5	0.045183
0.510	438.3	491.2	2643.3	1965.1	-0.004306

0.512	440.9	493.8	2620.6	1967.7	0.015871
0.514	443.6	496.5	2705.1	1970.6	-0.008928
0.516	446.3	499.2	2657.3	1973.2	0.000746
0.518	448.9	501.8	2661.2	1975.9	-0.014775
0.520	451.5	504.4	2583.7	1978.2	-0.042226
0.522	453.9	506.8	2374.4	1979.7	-0.008004
0.524	456.2	509.1	2336.7	1981.1	0.014860
0.526	458.6	511.5	2407.2	1982.7	0.021065
0.528	461.1	514.0	2510.8	1984.7	-0.018590
0.530	463.6	516.5	2419.1	1986.3	-0.018665
0.532	465.9	518.8	2330.5	1987.6	-0.034964
0.534	468.1	521.0	2173.0	1988.3	0.008421
0.536	470.3	523.2	2209.9	1989.2	0.031895
0.538	472.6	525.5	2355.5	1990.5	0.001487
0.540	475.0	527.9	2362.5	1991.9	0.004791
0.542	477.4	530.3	2385.3	1993.4	-0.020625
0.544	479.7	532.6	2288.9	1994.4	-0.005669
0.546	481.9	534.8	2263.1	1995.4	-0.011869
0.548	484.1	537.0	2210.0	1996.2	0.015495
0.550	486.4	539.3	2279.6	1997.2	0.004136
0.552	488.7	541.6	2298.5	1998.3	-0.018494
0.554	490.9	543.8	2215.0	1999.1	0.033597
0.556	493.3	546.2	2369.0	2000.4	0.076478
0.558	496.1	549.0	2761.4	2003.2	0.023277
0.560	499.0	551.9	2893.0	2006.3	-0.076732
0.562	501.4	554.3	2480.7	2008.0	0.013979
0.564	504.0	556.9	2551.0	2010.0	-0.005951
0.566	506.5	559.4	2520.8	2011.8	-0.002029
0.568	509.0	561.9	2510.6	2013.5	-0.000653
0.570	511.5	564.4	2507.3	2015.3	0.030577
0.572	514.2	567.1	2665.5	2017.5	-0.025912
0.574	516.7	569.6	2530.9	2019.3	0.019500
0.576	519.4	572.3	2631.5	2021.4	0.000419
0.578	522.0	574.9	2633.7	2023.6	-0.022018
0.580	524.5	577.4	2520.3	2025.3	-0.017105
0.582	526.9	579.8	2435.5	2026.7	0.031212
0.584	529.5	582.4	2592.4	2028.6	-0.001235
0.586	532.1	585.0	2586.0	2030.5	-0.023837
0.588	534.6	587.5	2465.6	2032.0	0.007983
0.590	537.1	590.0	2505.3	2033.6	0.002073
0.592	539.6	592.5	2515.7	2035.2	0.030645
0.594	542.3	595.2	2674.8	2037.4	-0.029070
0.596	544.8	597.7	2523.7	2039.0	-0.011758
0.598	547.3	600.2	2465.0	2040.4	0.005613
0.600	549.8	602.7	2492.8	2042.0	0.024094
0.602	552.4	605.3	2615.9	2043.9	0.010436
0.604	555.0	607.9	2671.1	2045.9	0.013955
0.606	557.8	610.7	2746.7	2048.3	-0.032853
0.608	560.4	613.3	2572.0	2050.0	0.034709
0.610	563.1	616.0	2756.9	2052.3	-0.077483
0.612	565.5	618.4	2360.4	2053.3	-0.051904
0.614	567.6	620.5	2127.5	2053.5	0.000159
0.616	569.7	622.6	2128.2	2053.8	0.035003
0.618	572.0	624.9	2282.5	2054.5	-0.036810
0.620	574.1	627.0	2120.5	2054.7	-0.000716
0.622	576.3	629.2	2117.4	2054.9	0.062689
0.624	578.7	631.6	2400.7	2056.0	0.116645
0.626	581.7	634.6	3034.7	2059.2	0.036337
0.628	585.0	637.9	3263.5	2063.0	-0.094043
0.630	587.7	640.6	2702.5	2065.0	0.073482

0.632	590.8	643.7	3131.1	2068.4	-0.047505
0.634	593.6	646.5	2847.2	2070.9	-0.025733
0.636	596.3	649.2	2704.3	2072.9	0.015205
0.638	599.1	652.0	2787.8	2075.1	0.013274
0.640	602.0	654.9	2862.8	2077.6	0.014235
0.642	604.9	657.8	2945.5	2080.3	-0.012177
0.644	607.8	660.7	2874.6	2082.7	-0.042257
0.646	610.5	663.4	2641.5	2084.5	0.010909
0.648	613.2	666.1	2699.8	2086.4	0.003651
0.650	615.9	668.8	2719.6	2088.3	-0.001579
0.652	618.6	671.5	2711.0	2090.2	-0.024292
0.654	621.2	674.1	2582.4	2091.7	0.000099
0.656	623.8	676.7	2582.9	2093.2	-0.000950
0.658	626.3	679.2	2578.0	2094.7	0.051144
0.660	629.2	682.1	2855.9	2097.0	-0.026493
0.662	631.9	684.8	2708.5	2098.9	0.012849
0.664	634.7	687.6	2779.0	2100.9	-0.004822
0.666	637.4	690.3	2752.4	2102.9	0.045243
0.668	640.4	693.3	3013.2	2105.6	-0.038682
0.670	643.2	696.1	2788.8	2107.6	-0.025574
0.672	645.9	698.8	2649.7	2109.2	-0.008152
0.674	648.5	701.4	2606.8	2110.7	-0.032712
0.676	650.9	703.8	2441.7	2111.7	-0.006417
0.678	653.3	706.2	2410.6	2112.6	0.006265
0.680	655.8	708.7	2441.0	2113.5	0.004005
0.682	658.2	711.1	2460.6	2114.6	0.009069
0.684	660.7	713.6	2505.6	2115.7	0.009476
0.686	663.3	716.2	2553.6	2117.0	0.032002
0.688	666.0	718.9	2722.4	2118.7	-0.097472
0.690	668.3	721.2	2238.8	2119.1	-0.008627
0.692	670.5	723.4	2200.5	2119.3	0.042846
0.694	672.9	725.8	2397.5	2120.1	0.021280
0.696	675.4	728.3	2501.8	2121.2	-0.011463
0.698	677.8	730.7	2445.1	2122.1	-0.015639
0.700	680.2	733.1	2369.8	2122.9	0.014923
0.702	682.6	735.5	2441.6	2123.8	-0.002733
0.704	685.0	737.9	2428.3	2124.6	0.034083
0.706	687.6	740.5	2599.6	2126.0	-0.014273
0.708	690.2	743.1	2526.5	2127.1	-0.012437
0.710	692.6	745.5	2464.4	2128.1	-0.004936
0.712	695.1	748.0	2440.2	2128.9	0.028360
0.714	697.7	750.6	2582.6	2130.2	-0.029908
0.716	700.1	753.0	2432.6	2131.0	-0.001791
0.718	702.5	755.4	2423.9	2131.9	0.002222
0.720	704.9	757.8	2434.7	2132.7	-0.034372
0.722	707.2	760.1	2272.9	2133.1	0.001284
0.724	709.5	762.4	2278.8	2133.5	0.040531
0.726	712.0	764.9	2471.3	2134.4	0.024008
0.728	714.6	767.5	2592.9	2135.7	-0.059680
0.730	716.9	769.8	2300.8	2136.1	0.035728
0.732	719.3	772.2	2471.3	2137.1	-0.024578
0.734	721.7	774.6	2352.8	2137.6	0.017003
0.736	724.1	777.0	2434.1	2138.4	0.014331
0.738	726.6	779.5	2504.9	2139.4	0.031022
0.740	729.3	782.2	2665.3	2140.9	-0.048561
0.742	731.7	784.6	2418.4	2141.6	0.025185
0.744	734.3	787.2	2543.4	2142.7	0.029947
0.746	737.0	789.9	2700.4	2144.2	-0.019331
0.748	739.6	792.5	2598.0	2145.4	-0.029923
0.750	742.0	794.9	2447.1	2146.2	0.031438

0.752	744.6	797.5	2605.9	2147.4	0.074963
0.754	747.6	800.5	3028.3	2149.8	-0.103668
0.756	750.1	803.0	2459.4	2150.6	-0.009304
0.758	752.5	805.4	2414.0	2151.3	0.019693
0.760	755.0	807.9	2511.0	2152.2	0.011349
0.762	757.6	810.5	2568.7	2153.3	-0.014817
0.764	760.1	813.0	2493.7	2154.2	0.002689
0.766	762.6	815.5	2507.1	2155.1	0.009956
0.768	765.1	818.0	2557.5	2156.2	0.000625
0.770	767.7	820.6	2560.7	2157.2	-0.021551
0.772	770.2	823.1	2452.7	2158.0	0.044417
0.774	772.8	825.7	2680.7	2159.3	-0.045077
0.776	775.3	828.2	2449.5	2160.1	-0.045195
0.778	777.5	830.4	2237.6	2160.3	0.099307
0.780	780.3	833.2	2731.1	2161.8	0.034267
0.782	783.2	836.1	2924.9	2163.7	-0.068349
0.784	785.7	838.6	2550.6	2164.7	-0.006826
0.786	788.3	841.2	2516.0	2165.6	0.010010
0.788	790.8	843.7	2566.9	2166.6	0.012140
0.790	793.4	846.3	2630.0	2167.8	0.021373
0.792	796.2	849.1	2744.9	2169.2	0.008645
0.794	799.0	851.9	2792.8	2170.8	0.101972
0.796	802.4	855.3	3427.0	2174.0	-0.111818
0.798	805.2	858.1	2737.7	2175.4	-0.054639
0.800	807.6	860.5	2454.0	2176.1	0.045240
0.802	810.3	863.2	2686.6	2177.3	0.024619
0.804	813.1	866.0	2822.2	2179.0	-0.033070
0.806	815.8	868.7	2641.5	2180.1	0.021462
0.808	818.5	871.4	2757.4	2181.5	0.079052
0.810	821.7	874.6	3230.7	2184.1	-0.090316
0.812	824.4	877.3	2695.5	2185.4	-0.052283
0.814	826.9	879.8	2427.7	2186.0	0.024664
0.816	829.4	882.3	2550.4	2186.9	0.049216
0.818	832.2	885.1	2814.5	2188.4	-0.012748
0.820	835.0	887.9	2743.6	2189.8	0.022521
0.822	837.8	890.7	2870.1	2191.4	0.003846
0.824	840.7	893.6	2892.2	2193.1	-0.021262
0.826	843.5	896.4	2771.8	2194.5	0.010047
0.828	846.3	899.2	2828.0	2196.0	-0.031381
0.830	849.0	901.9	2656.0	2197.2	0.010876
0.832	851.7	904.6	2714.4	2198.4	0.008095
0.834	854.5	907.4	2758.7	2199.7	-0.030828
0.836	857.1	910.0	2593.7	2200.7	0.017735
0.838	859.7	912.6	2687.3	2201.8	0.010895
0.840	862.5	915.4	2746.5	2203.1	-0.023013
0.842	865.1	918.0	2623.0	2204.1	0.030608
0.844	867.9	920.8	2788.6	2205.5	0.071165
0.846	871.1	924.0	3215.9	2207.9	-0.022061
0.848	874.2	927.1	3077.1	2210.0	-0.007420
0.850	877.2	930.1	3031.7	2211.9	-0.014541
0.852	880.2	933.1	2944.8	2213.6	0.010681
0.854	883.2	936.1	3008.4	2215.5	0.020873
0.856	886.3	939.2	3136.7	2217.6	0.002889
0.858	889.5	942.4	3154.9	2219.8	-0.001941
0.860	892.6	945.5	3142.7	2222.0	-0.028076
0.862	895.6	948.5	2971.0	2223.7	-0.034357
0.864	898.4	951.3	2773.6	2225.0	-0.022795
0.866	901.0	953.9	2650.0	2225.9	0.000478
0.868	903.7	956.6	2652.5	2226.9	0.007816
0.870	906.4	959.3	2694.3	2228.0	0.056598

0.872	909.4	962.3	3017.6	2229.8	-0.027289
0.874	912.2	965.1	2857.3	2231.3	-0.025481
0.876	914.9	967.8	2715.3	2232.4	-0.023875
0.878	917.5	970.4	2588.7	2233.2	0.004270
0.880	920.1	973.0	2610.9	2234.0	-0.001817
0.882	922.7	975.6	2601.4	2234.9	-0.009139
0.884	925.3	978.2	2554.3	2235.6	0.009652
0.886	927.9	980.8	2604.1	2236.4	-0.006925
0.888	930.5	983.4	2568.3	2237.2	0.023618
0.890	933.2	986.1	2692.5	2238.2	0.012956
0.892	935.9	988.8	2763.2	2239.4	-0.045701
0.894	938.5	991.4	2521.7	2240.0	0.001498
0.896	941.0	993.9	2529.2	2240.6	-0.003772
0.898	943.5	996.4	2510.2	2241.2	-0.000854
0.900	946.0	998.9	2505.9	2241.8	-0.004412
0.902	948.5	1001.4	2483.9	2242.4	0.022339
0.904	951.1	1004.0	2597.4	2243.2	0.008690
0.906	953.7	1006.6	2643.0	2244.0	-0.009882
0.908	956.3	1009.2	2591.2	2244.8	0.024342
0.910	959.0	1011.9	2720.5	2245.8	0.004365
0.912	961.8	1014.7	2744.4	2246.9	-0.018532
0.914	964.4	1017.3	2644.5	2247.8	-0.005603
0.916	967.0	1019.9	2615.1	2248.6	0.005753
0.918	969.7	1022.6	2645.3	2249.5	-0.031175
0.920	972.2	1025.1	2485.4	2250.0	0.026218
0.922	974.8	1027.7	2619.2	2250.8	0.033909
0.924	977.6	1030.5	2803.1	2252.0	-0.014772
0.926	980.3	1033.2	2721.5	2253.0	-0.009381
0.928	983.0	1035.9	2670.9	2253.9	-0.020780
0.930	985.5	1038.4	2562.1	2254.6	0.033531
0.932	988.3	1041.2	2739.9	2255.6	0.010142
0.934	991.1	1044.0	2796.1	2256.8	0.013367
0.936	994.0	1046.9	2871.8	2258.1	-0.034835
0.938	996.6	1049.5	2678.5	2259.0	-0.007506
0.940	999.3	1052.2	2638.6	2259.8	0.014989
0.942	1002.0	1054.9	2718.9	2260.8	0.015400
0.944	1004.8	1057.7	2803.9	2261.9	-0.018136
0.946	1007.5	1060.4	2704.0	2262.8	-0.005279
0.948	1010.2	1063.1	2675.6	2263.7	0.010618
0.950	1012.9	1065.8	2733.1	2264.7	0.000210
0.952	1015.6	1068.5	2734.2	2265.7	0.044613
0.954	1018.6	1071.5	2989.6	2267.2	-0.047667
0.956	1021.3	1074.2	2717.5	2268.1	0.030425
0.958	1024.2	1077.1	2888.1	2269.4	-0.014560
0.960	1027.0	1079.9	2805.2	2270.6	0.010227
0.962	1029.9	1082.8	2863.2	2271.8	-0.015286
0.964	1032.7	1085.6	2776.9	2272.8	0.002889
0.966	1035.5	1088.4	2793.0	2273.9	0.002037
0.968	1038.3	1091.2	2804.4	2275.0	-0.002992
0.970	1041.1	1094.0	2787.7	2276.1	-0.005546
0.972	1043.8	1096.7	2756.9	2277.1	0.025842
0.974	1046.7	1099.6	2903.2	2278.3	0.007601
0.976	1049.7	1102.6	2947.7	2279.7	0.000539
0.978	1052.6	1105.5	2950.9	2281.1	0.022155
0.980	1055.7	1108.6	3084.6	2282.7	0.007229
0.982	1058.8	1111.7	3129.5	2284.4	-0.033332
0.984	1061.8	1114.7	2927.6	2285.8	0.002958
0.986	1064.7	1117.6	2945.0	2287.1	-0.007169
0.988	1067.6	1120.5	2903.1	2288.3	-0.005555
0.990	1070.5	1123.4	2871.0	2289.5	0.023156

0.992	1073.5	1126.4	3007.1	2291.0	0.025017
0.994	1076.7	1129.6	3161.4	2292.7	-0.006707
0.996	1079.8	1132.7	3119.3	2294.4	-0.051314
0.998	1082.6	1135.5	2814.8	2295.4	-0.011683
1.000	1085.3	1138.2	2749.8	2296.3	0.014802
1.002	1088.2	1141.1	2832.4	2297.4	-0.006029
1.004	1091.0	1143.9	2798.5	2298.4	-0.006080
1.006	1093.7	1146.6	2764.6	2299.3	-0.000348
1.008	1096.5	1149.4	2762.7	2300.2	0.007518
1.010	1099.3	1152.2	2804.6	2301.2	0.012338
1.012	1102.2	1155.1	2874.6	2302.4	-0.001902
1.014	1105.0	1157.9	2863.7	2303.5	0.014461
1.016	1108.0	1160.9	2947.8	2304.7	0.016586
1.018	1111.0	1163.9	3047.2	2306.2	-0.025535
1.020	1113.9	1166.8	2895.4	2307.4	-0.028134
1.022	1116.7	1169.6	2737.0	2308.2	-0.000317
1.024	1119.4	1172.3	2735.2	2309.0	-0.006946
1.026	1122.1	1175.0	2697.5	2309.8	-0.002731
1.028	1124.8	1177.7	2682.8	2310.5	0.004527
1.030	1127.5	1180.4	2707.2	2311.3	0.002951
1.032	1130.2	1183.1	2723.2	2312.1	-0.003011
1.034	1132.9	1185.8	2706.9	2312.9	-0.021009
1.036	1135.5	1188.4	2595.5	2313.4	0.003629
1.038	1138.1	1191.0	2614.4	2314.0	0.010303
1.040	1140.8	1193.7	2668.8	2314.7	-0.001640
1.042	1143.5	1196.4	2660.1	2315.3	-0.026859
1.044	1146.0	1198.9	2520.9	2315.7	-0.010055
1.046	1148.5	1201.4	2470.7	2316.0	0.022526
1.048	1151.0	1203.9	2584.6	2316.5	0.022434
1.050	1153.7	1206.6	2703.3	2317.3	-0.012419
1.052	1156.4	1209.3	2636.9	2317.9	-0.000113
1.054	1159.0	1211.9	2636.3	2318.5	0.012243
1.056	1161.7	1214.6	2701.7	2319.2	-0.017552
1.058	1164.3	1217.2	2608.5	2319.7	0.037752
1.060	1167.1	1220.0	2813.2	2320.7	-0.009036
1.062	1169.9	1222.8	2762.8	2321.5	-0.002263
1.064	1172.6	1225.5	2750.3	2322.3	-0.015935
1.066	1175.3	1228.2	2664.0	2323.0	0.005277
1.068	1178.0	1230.9	2692.3	2323.7	0.019063
1.070	1180.8	1233.7	2796.9	2324.5	-0.002092
1.072	1183.6	1236.5	2785.2	2325.4	-0.024754
1.074	1186.2	1239.1	2650.7	2326.0	-0.007482
1.076	1188.8	1241.7	2611.3	2326.5	0.006536
1.078	1191.5	1244.4	2645.7	2327.1	-0.003343
1.080	1194.1	1247.0	2628.0	2327.7	0.020086
1.082	1196.9	1249.8	2735.8	2328.4	0.013073
1.084	1199.7	1252.6	2808.3	2329.3	0.043578
1.086	1202.7	1255.6	3064.2	2330.7	-0.033898
1.088	1205.6	1258.5	2863.3	2331.7	-0.021543
1.090	1208.3	1261.2	2742.5	2332.4	0.020998
1.092	1211.2	1264.1	2860.1	2333.4	-0.031545
1.094	1213.9	1266.8	2685.2	2334.0	0.019625
1.096	1216.7	1269.6	2792.7	2334.9	0.015227
1.098	1219.6	1272.5	2879.1	2335.8	-0.009897
1.100	1222.4	1275.3	2822.6	2336.7	0.006805
1.102	1225.2	1278.1	2861.3	2337.7	-0.000821
1.104	1228.1	1281.0	2856.6	2338.6	0.006565
1.106	1231.0	1283.9	2894.4	2339.6	-0.003969
1.108	1233.9	1286.8	2871.5	2340.6	-0.004188
1.110	1236.7	1289.6	2847.5	2341.5	0.006414

1.112	1239.6	1292.5	2884.3	2342.5	0.003147
1.114	1242.5	1295.4	2902.5	2343.5	-0.016521
1.116	1245.3	1298.2	2808.2	2344.3	0.023223
1.118	1248.2	1301.1	2941.7	2345.4	-0.004801
1.120	1251.2	1304.1	2913.6	2346.4	-0.011682
1.122	1254.0	1306.9	2846.3	2347.3	0.021106
1.124	1257.0	1309.9	2969.0	2348.4	-0.007511
1.126	1259.9	1312.8	2924.8	2349.4	-0.013385
1.128	1262.7	1315.6	2847.5	2350.3	-0.009502
1.130	1265.5	1318.4	2793.9	2351.1	-0.005378
1.132	1268.3	1321.2	2764.0	2351.8	-0.005969
1.134	1271.0	1323.9	2731.2	2352.5	0.034156
1.136	1274.0	1326.9	2924.4	2353.5	0.020384
1.138	1277.0	1329.9	3046.1	2354.7	-0.013046
1.140	1280.0	1332.9	2967.6	2355.8	0.008055
1.142	1283.0	1335.9	3015.8	2356.9	-0.000739
1.144	1286.0	1338.9	3011.4	2358.1	-0.027079
1.146	1288.9	1341.8	2852.6	2358.9	0.005299
1.148	1291.7	1344.6	2883.0	2359.9	0.039495
1.150	1294.9	1347.8	3120.1	2361.2	-0.040959
1.152	1297.7	1350.6	2874.5	2362.1	0.015729
1.154	1300.7	1353.6	2966.4	2363.1	0.004176
1.156	1303.7	1356.6	2991.3	2364.2	-0.011239
1.158	1306.6	1359.5	2924.8	2365.2	-0.006845
1.160	1309.5	1362.4	2885.0	2366.1	0.011120
1.162	1312.4	1365.3	2949.9	2367.1	0.004827
1.164	1315.4	1368.3	2978.5	2368.1	-0.011204
1.166	1318.3	1371.2	2912.5	2369.1	0.014892
1.168	1321.3	1374.2	3000.6	2370.1	0.034458
1.170	1324.6	1377.5	3214.7	2371.6	-0.017938
1.172	1327.7	1380.6	3101.4	2372.8	-0.010355
1.174	1330.7	1383.6	3037.9	2374.0	-0.022355
1.176	1333.6	1386.5	2905.0	2374.9	0.021496
1.178	1336.6	1389.5	3032.7	2376.0	0.005018
1.180	1339.7	1392.6	3063.3	2377.1	0.001053
1.182	1342.8	1395.7	3069.7	2378.3	0.006637
1.184	1345.9	1398.8	3110.7	2379.6	0.001887
1.186	1349.0	1401.9	3122.5	2380.8	0.002015
1.188	1352.1	1405.0	3135.1	2382.1	-0.000436
1.190	1355.3	1408.2	3132.4	2383.3	0.006644
1.192	1358.4	1411.3	3174.3	2384.7	0.008251
1.194	1361.7	1414.6	3227.1	2386.1	-0.007444
1.196	1364.8	1417.7	3179.4	2387.4	0.004265
1.198	1368.1	1421.0	3206.6	2388.8	-0.001489
1.200	1371.2	1424.1	3197.1	2390.1	-0.009639
1.202	1374.4	1427.3	3136.1	2391.4	0.010461
1.204	1377.6	1430.5	3202.4	2392.7	0.011655
1.206	1380.9	1433.8	3277.9	2394.2	-0.004804
1.208	1384.1	1437.0	3246.5	2395.6	0.004160
1.210	1387.4	1440.3	3273.7	2397.0	-0.000379
1.212	1390.7	1443.6	3271.2	2398.5	0.001742
1.214	1393.9	1446.8	3282.6	2399.9	0.001124
1.216	1397.2	1450.1	3290.0	2401.4	0.007898
1.218	1400.6	1453.5	3342.4	2402.9	-0.013342
1.220	1403.8	1456.7	3254.4	2404.3	-0.008634
1.222	1407.0	1459.9	3198.6	2405.6	0.070087
1.224	1410.7	1463.6	3680.8	2407.7	-0.027475
1.226	1414.2	1467.1	3484.0	2409.5	-0.025866
1.228	1417.5	1470.4	3308.3	2410.9	-0.001937
1.230	1420.8	1473.7	3295.5	2412.4	0.004392

1.232	1424.1	1477.0	3324.5	2413.9	-0.000002
1.234	1427.4	1480.3	3324.5	2415.3	-0.003174
1.236	1430.7	1483.6	3303.5	2416.8	-0.003190
1.238	1434.0	1486.9	3282.5	2418.2	-0.001753
1.240	1437.3	1490.2	3271.0	2419.6	-0.003278
1.242	1440.5	1493.4	3249.6	2420.9	0.004507
1.244	1443.8	1496.7	3279.1	2422.3	0.001705
1.246	1447.1	1500.0	3290.3	2423.7	-0.001588
1.248	1450.4	1503.3	3279.8	2425.0	0.007409
1.250	1453.7	1506.6	3328.8	2426.5	0.001080
1.252	1457.1	1510.0	3336.0	2427.9	0.010540
1.254	1460.5	1513.4	3407.1	2429.5	-0.002486
1.256	1463.9	1516.8	3390.2	2431.0	0.001677
1.258	1467.3	1520.2	3401.6	2432.6	-0.003522
1.260	1470.6	1523.5	3377.7	2434.1	0.000518
1.262	1474.0	1526.9	3381.2	2435.6	-0.000940
1.264	1477.4	1530.3	3374.8	2437.1	0.003497
1.266	1480.8	1533.7	3398.5	2438.6	-0.005025
1.268	1484.2	1537.1	3364.5	2440.0	-0.001224
1.270	1487.5	1540.4	3356.3	2441.5	-0.000266
1.272	1490.9	1543.8	3354.5	2442.9	-0.011493
1.274	1494.1	1547.0	3278.3	2444.2	-0.019509
1.276	1497.3	1550.2	3152.8	2445.3	0.020146
1.278	1500.6	1553.5	3282.5	2446.6	-0.008481
1.280	1503.8	1556.7	3227.3	2447.9	-0.001720
1.282	1507.0	1559.9	3216.2	2449.1	-0.006293
1.284	1510.2	1563.1	3175.9	2450.2	0.037995
1.286	1513.6	1566.5	3426.8	2451.7	-0.024816
1.288	1516.9	1569.8	3260.9	2453.0	0.021294
1.290	1520.3	1573.2	3402.8	2454.4	-0.046392
1.292	1523.4	1576.3	3101.0	2455.4	0.001760
1.294	1526.5	1579.4	3112.0	2456.5	-0.021527
1.296	1529.5	1582.4	2980.8	2457.3	0.005240
1.298	1532.5	1585.4	3012.2	2458.1	-0.006316
1.300	1535.5	1588.4	2974.4	2458.9	-0.002500
1.302	1538.4	1591.3	2959.6	2459.7	0.015877
1.304	1541.5	1594.4	3055.1	2460.6	-0.017219
1.306	1544.4	1597.3	2951.6	2461.4	0.002942
1.308	1547.4	1600.3	2969.0	2462.1	-0.004092
1.310	1550.4	1603.3	2944.8	2462.9	-0.004629
1.312	1553.3	1606.2	2917.7	2463.6	0.036333
1.314	1556.4	1609.3	3137.7	2464.6	0.029190
1.316	1559.7	1612.6	3326.4	2465.9	0.041134
1.318	1563.3	1616.2	3611.8	2467.6	0.002121
1.320	1567.0	1619.9	3627.2	2469.4	-0.007656
1.322	1570.5	1623.4	3572.0	2471.1	-0.012704
1.324	1574.0	1626.9	3482.4	2472.6	-0.028595
1.326	1577.3	1630.2	3288.8	2473.8	0.003883
1.328	1580.6	1633.5	3314.4	2475.1	-0.042088
1.330	1583.7	1636.6	3046.7	2475.9	-0.001529
1.332	1586.7	1639.6	3037.4	2476.8	0.013590
1.334	1589.8	1642.7	3121.1	2477.8	0.001870
1.336	1593.0	1645.9	3132.8	2478.7	0.008645
1.338	1596.2	1649.1	3187.4	2479.8	0.004971
1.340	1599.4	1652.3	3219.3	2480.9	-0.030981
1.342	1602.4	1655.3	3025.8	2481.7	-0.017102
1.344	1605.3	1658.2	2924.1	2482.4	0.032505
1.346	1608.4	1661.3	3120.5	2483.3	-0.004693
1.348	1611.5	1664.4	3091.4	2484.2	0.001197
1.350	1614.6	1667.5	3098.8	2485.1	0.036494

1.352	1618.0	1670.9	3333.5	2486.4	0.046095
1.354	1621.6	1674.5	3655.7	2488.1	-0.016229
1.356	1625.2	1678.1	3538.9	2489.7	-0.007419
1.358	1628.7	1681.6	3486.8	2491.1	-0.002985
1.360	1632.1	1685.0	3466.1	2492.6	0.005561
1.362	1635.6	1688.5	3504.8	2494.0	-0.000517
1.364	1639.1	1692.0	3501.2	2495.5	0.001489
1.366	1642.6	1695.5	3511.6	2497.0	-0.030432
1.368	1645.9	1698.8	3304.2	2498.2	-0.040775
1.370	1649.0	1701.9	3045.3	2499.0	0.078009
1.372	1652.5	1705.4	3560.6	2500.5	-0.016011
1.374	1656.0	1708.9	3448.4	2501.9	-0.045088
1.376	1659.1	1712.0	3150.9	2502.9	0.011402
1.378	1662.4	1715.3	3223.5	2503.9	0.016591
1.380	1665.7	1718.6	3332.3	2505.1	-0.015522
1.382	1668.9	1721.8	3230.4	2506.2	0.012928
1.384	1672.2	1725.1	3315.1	2507.3	-0.014203
1.386	1675.5	1728.4	3222.2	2508.4	-0.016822
1.388	1678.6	1731.5	3115.6	2509.2	-0.006401
1.390	1681.7	1734.6	3076.0	2510.0	0.035975
1.392	1685.0	1737.9	3305.5	2511.2	0.024038
1.394	1688.4	1741.3	3468.4	2512.6	0.024849
1.396	1692.1	1745.0	3645.1	2514.2	-0.031546
1.398	1695.5	1748.4	3422.2	2515.5	0.033172
1.400	1699.2	1752.1	3657.0	2517.1	-0.021974
1.402	1702.7	1755.6	3499.8	2518.5	-0.006643
1.404	1706.1	1759.0	3453.6	2519.9	-0.009577
1.406	1709.5	1762.4	3388.1	2521.1	-0.001723
1.408	1712.9	1765.8	3376.4	2522.3	-0.001355
1.410	1716.2	1769.1	3367.3	2523.5	0.014263
1.412	1719.7	1772.6	3464.7	2524.8	0.007862
1.414	1723.2	1776.1	3519.6	2526.2	-0.024320
1.416	1726.6	1779.5	3352.5	2527.4	0.027515
1.418	1730.1	1783.0	3542.2	2528.8	-0.025801
1.420	1733.5	1786.4	3364.0	2530.0	0.001748
1.422	1736.9	1789.8	3375.8	2531.2	-0.018994
1.424	1740.1	1793.0	3249.9	2532.2	0.003961
1.426	1743.4	1796.3	3275.8	2533.3	-0.008750
1.428	1746.6	1799.5	3219.0	2534.2	-0.000950