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BEACH PETROLEUM

NORTH PAARATTE-1

W727

BEACH PETROLEUM N.L.

NORTH PAARATTE NO. 1

WELL COMPLETION REPORT

OIL and GAS DIVISION

Prepared by D.M. Harrison and W. Lawson

January, 1980

Distribution: Beach 2
Department of Minerals and Energy 2

SUMMARY

North Paaratte No. 1 was drilled as a new field wildcat well in the Port Campbell embayment of the Otway Basin over a 21 day period from 31st October, 1979 to the 21st November, 1979.

The well resulted in a significant gas discovery. An open hole drill stem test (DST-3) over the interval 4735 to 4771 feet (1444 to 1456m) flowed gas at a rate of 7MMCFD (198,000 cubic metres per day) through a 7/16 inch (11 mm) choke. This flow was from Waarre Formation sandstone. The well was completed with production casing, tubing and a christmas tree as a potential producer. Subsequent production testing flowed gas at a stabilized flow of 9.5 MMCFD (269,000 cubic metres per day).

Further work is required before it can be determined if this well is the discovery well of a commercial field.

The well was drilled with O.D. & E.'s rig 12, a National 50 drilling rig, with the following contract services:-

Halliburton	- Cementing and Casing
Go International	- Electric Logging
Go International	- Production Testing
Exlog	- Mud Logging
Velocity Data Pty. Ltd.	- Velocity Survey

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- B IES-GR-CAL Run 2 5"/100ft.
- 5 A LL-GR Run 1 2"/100ft.
- B LL-GR Run 1 5"/100ft.
- 6 A MLL-GR-CAL Run 1 2"/100ft.
- B MLL-GR-CAL Run 1 5"/100ft.
- 7 A CDL-CNL Run 1 2"/100ft.
- B CDL-CNL Run 1 5"/100ft.
- 8 Selective Formation Tester.

1. PURPOSE OF WELL

The North Paaratte No. 1 well was drilled to test the Waarre Formation on a discrete 'closure' of the Port Campbell High. The Port Campbell High is a prominent nose plunging down into the Port Campbell Embayment in the Otway Basin. (Figure 3). A comprehensive review of the seismic with some reprocessing to enhance the data quality at Waarre Formation level defined the North Paaratte structure. (Figure 4). Further, a high amplitude seismic event on the structure was interpreted to indicate gas in place in the reservoir sands. In view of the above, the encouraging gas and condensate shows in the nearby Port Campbell 1, 3 and 4 wells, the changing economics of the day which makes smaller targets profitable and the possibility of a local market at Warrnambool, the North Paaratte No. 1 prospect was considered a worthy exploration prospect.

2. GENERALISED STRATIGRAPHIC TABLE OF THE PORT CAMPBELL EMBAYMENT

<u>Age</u>	<u>Group</u>	<u>Formation</u>
Tertiary	Heytesbury	Port Campbell Limestone
		Gellibrand Marl
		Clifton Formation
	Nirranda	Narrawaturk Marl
		Mepunga Formation
		Dilwyn Formation
	Wangerrip	Pember Mudstone
		Pebble Point Formation
		Paaratte Formation
		Nullawarre Greensand
Upper Cretaceous	Sherbrook	Belfast Formation
		Flaxman Formation
		Waarre Formation
		Eumeralla Formation
Lower Cretaceous	Otway	

3. WELL HISTORY

3.1. Location (Refer Figures 1 and 2)

The well was located as near as practicable to Shot Point No. 180 on seismic line 073-135 of the Coastal Strip Survey. Shot Point No. 180 is on the main (surfaced) road from Timboon to Peterborough, called the Peterborough Road, about 12 kilometres (7½ miles) from Timboon. The drill site was prepared on crown allotment 2, section 8 of the Parish of Paaratte, County of Heytesbury. This land is owned by Mr. M.J. Rylance.

The approximate geographical co-ordinates are:-

142° 57' 15" E
38° 33' 10" S

3.2. General Data

(i) Well Name and Number

Beach North Paaratte No. 1.

(ii) Petroleum Title

Petroleum Exploration Permit No. 93, State of Victoria.

(iii) District

1:250,000 map sheet: Colac, sheet SJ54-12; part of the Western District of Victoria.

(iv) Elevation (approximate)

Ground Level: 304 feet (92.7 m) above sea level.

Kelly Bushing (Datum): 315 feet (96.0 m) above sea level.

(v) Total Depth

Driller: 5068 feet (1545.1 m)

Logger: 5039 feet (1536.3 m)

(vi) Date Drilling Commenced

10.30 Hours, Wednesday 31st October, 1979.

(vii) Date Total Depth Reached

14.30 Hours, Wednesday 21st November, 1979.

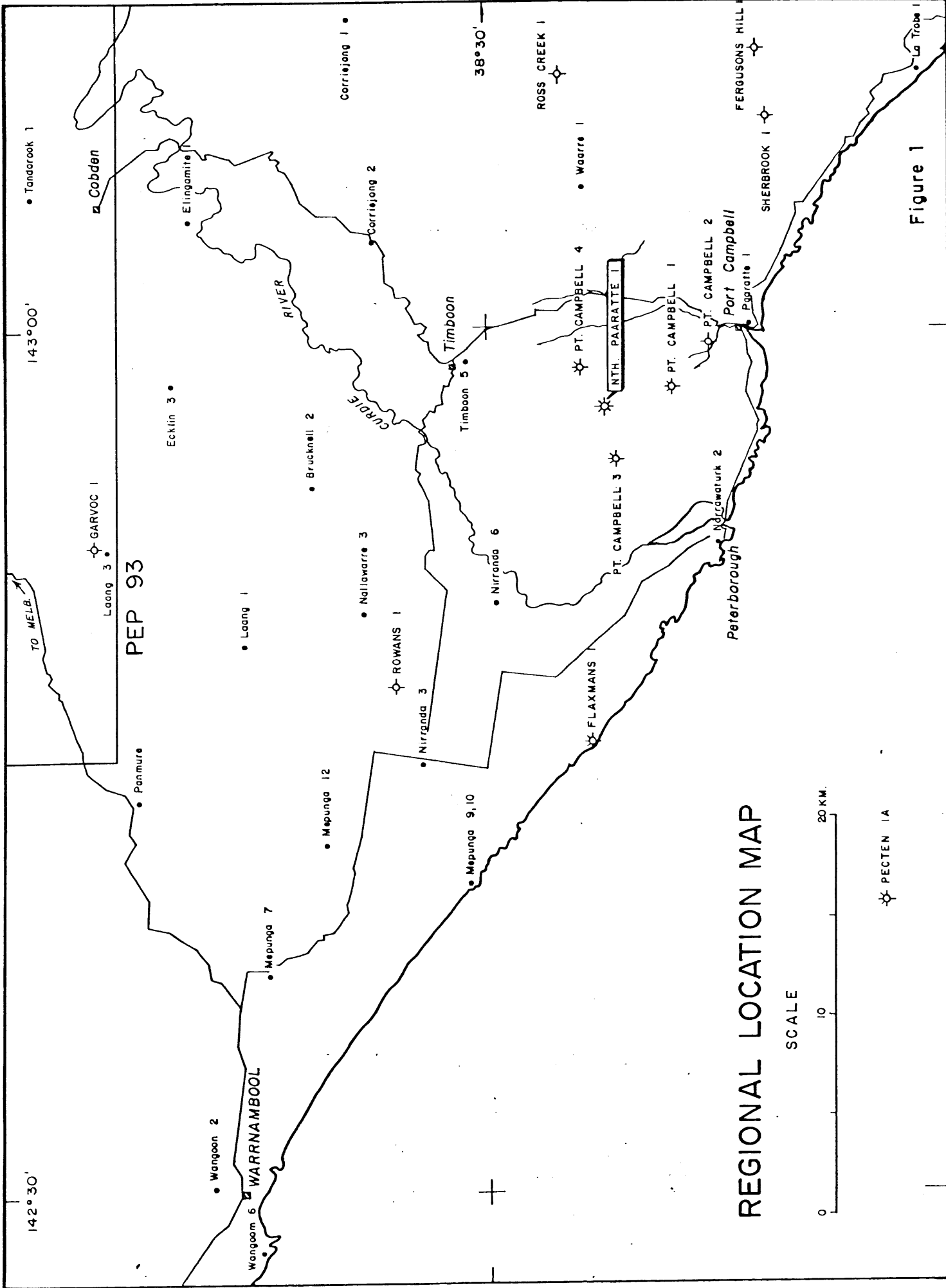
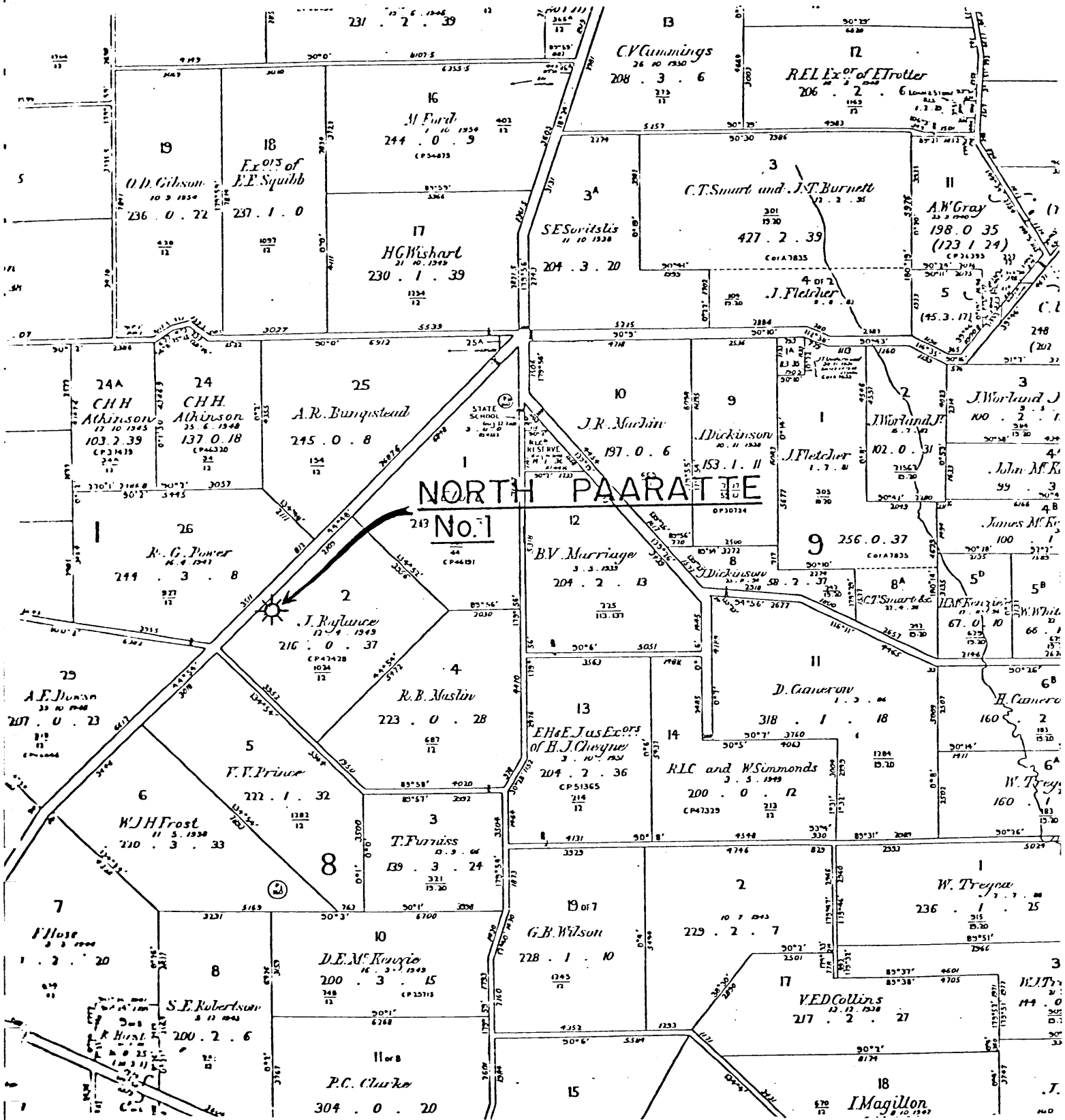
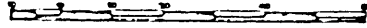


Figure 1

PAARATTE

COUNTY OF HEYTESBURY

SCALE OF CHAINS



DETAILED LOCATION MAP

Figure 3
 BEACH PETROLEUM N.L.
 PEP 93 - VICTORIA

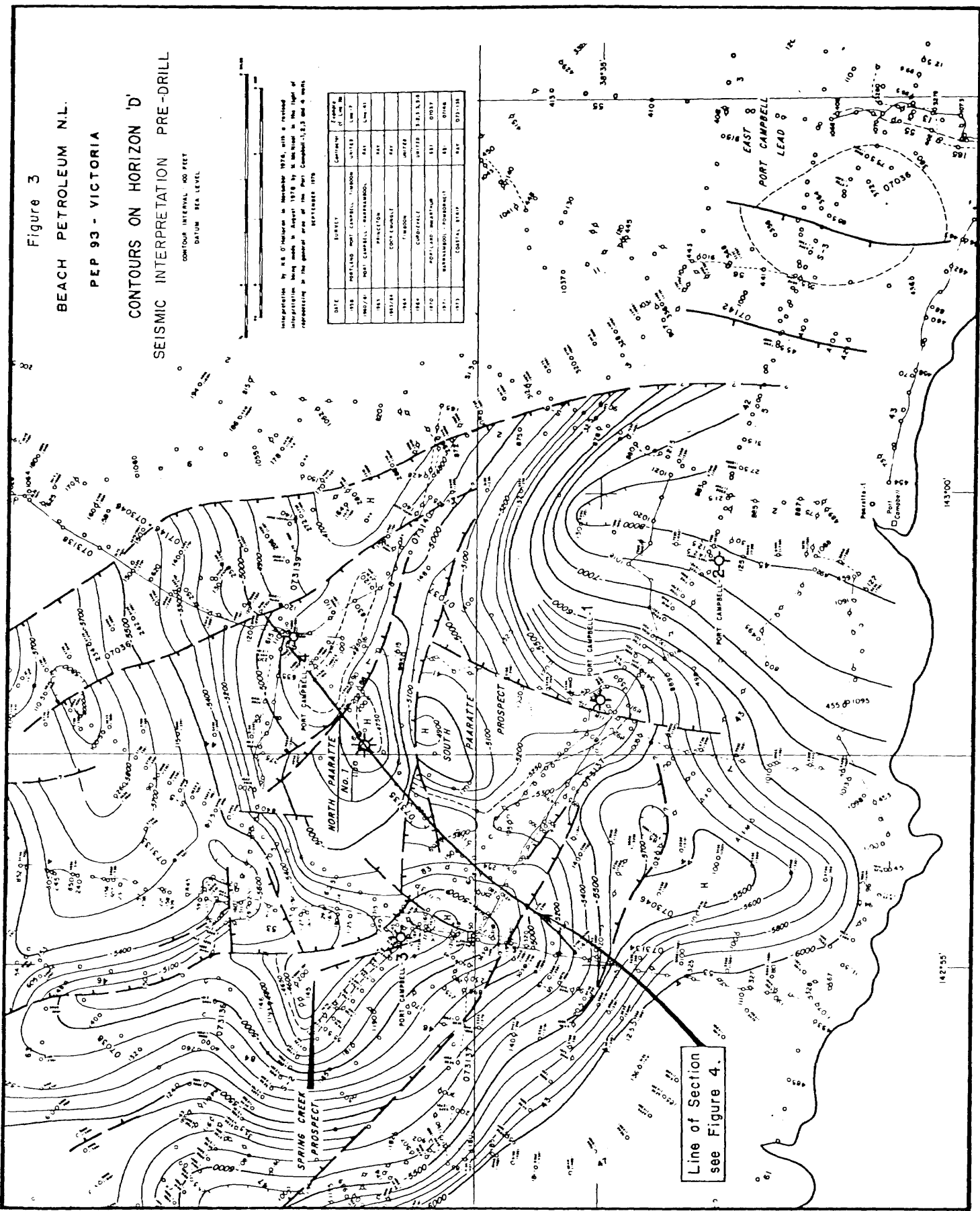
CONTOURS ON HORIZON 'D'
 SEISMIC INTERPRETATION PRE-DRILL

CONTOUR INTERVAL 100 FEET
 DATUM SEA LEVEL



Interpretation by B.S. O'Malley in November 1976, with a revised interpretation being made in August 1978 by M. Macdonald in the light of information in the general area of the Port Campbell-1, 2, 3 and 4 wells, SEPTEMBER 1978

DATE	SURVEY	COMPANY	DEPTH OF LOG IN FEET
1978	PORTLAND - PORT CAMPBELL - TARBROOK	UNITED	1000-11
1978/8	PORT CAMPBELL - TARBROOK	BAE	1000-11
1973	FRANCKTON	BAE	
1973	CORLEWALLE	BAE	
1974	TARBROOK	UNITED	3713, 3719
1974	CORLEWALLE	UNITED	3713, 3719
1970	PORTLAND - TARBROOK	BAE	07032
1971	TARBROOK - TARBROOK	BAE	07118
1973	CORLEWALLE	BAE	07118



Line of Section
 see Figure 4.

NORTH PAARATTE

No. 1

LOCATION

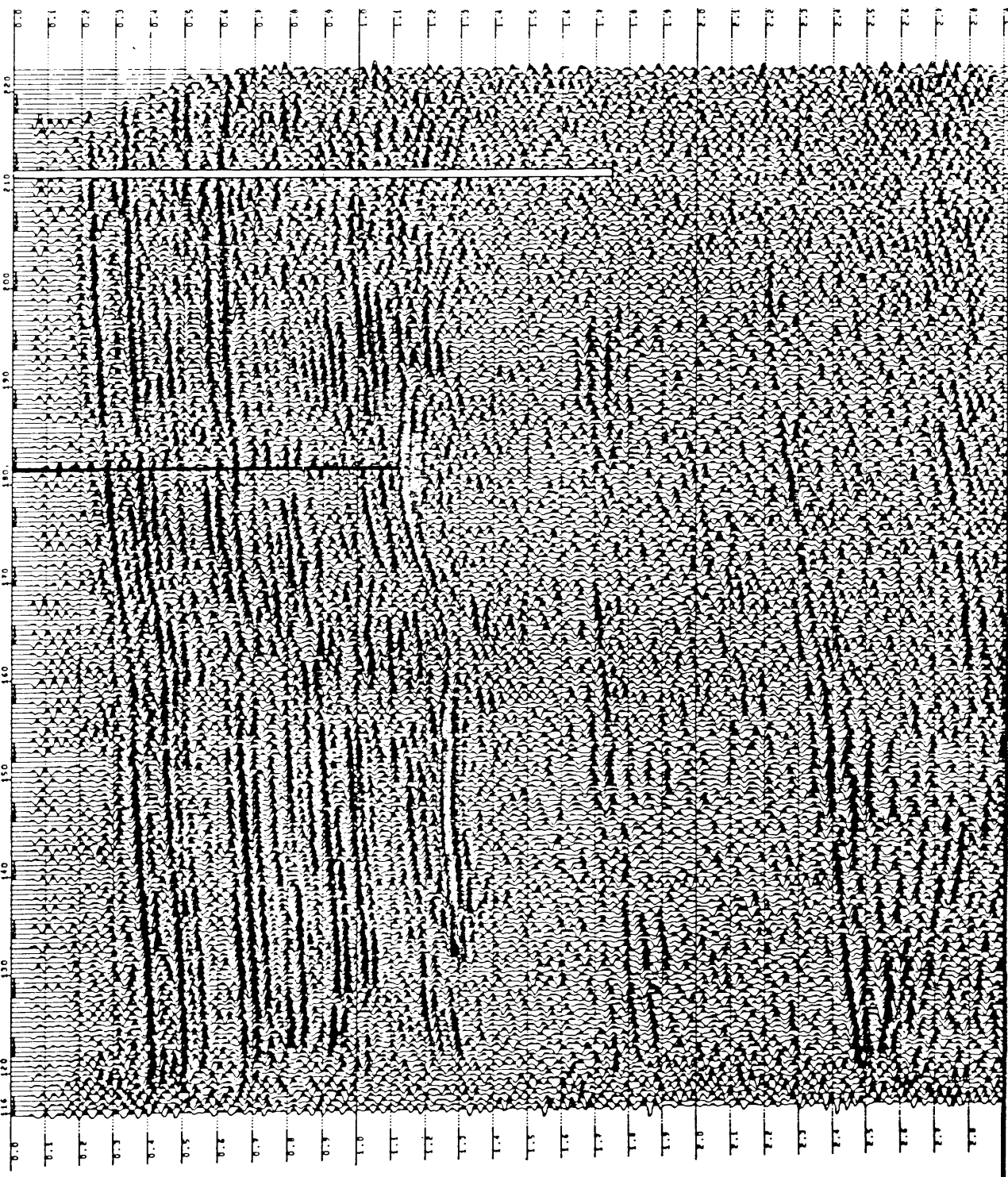
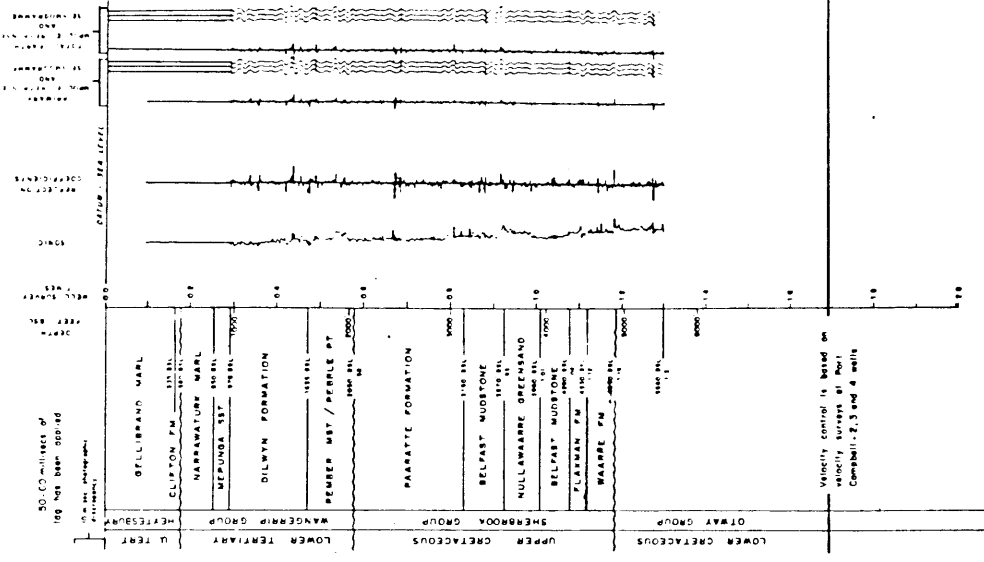
LINE 73-135 PORT CAMPBELL JOB SHEET, BEACH PETROLEUM 0.8 SEC. / TUFFIER / AUTOMATIC STATICS - 0.4 SEC. / TUFFIER 0-1.5 SEC. / 8-20-40-45 MF. 13-40 SEC. / 4-60-40-45 MF. 1

PORT CAMPBELL - 4



PORT CAMPBELL - 4 (Beach Synthetic Seismogram)

KR 447/85L



SEISMIC SECTION
Line 73-135
PRE - DRILL

Figure 4

(viii) Date Rig Released

22.00 Hours, Thursday 29th November, 1979.

(ix) Drilling Time in Days to Total Depth

21 Days

(x) Status

Completed and suspended as a potential producing gas well.

3.3. Drilling Data

3.3.1. Plant

O.D. & E. Pty. Ltd. of 50 Bridge Street, Sydney, N.S.W. 2000 contracted their rig 12, a National 50 drilling rig. Details of the plant are provided in Appendix 1.

3.3.2. Casing and Cementing Details

Conductor Pipe

Size: 19½" 49.5 cm.
Set at: 32' 9.8 m.
Cement: 50 sacks, Type A.

Surface Casing

Size: 13 3/8" 34 cm.
Set at: 292' 89.1 m.
Cement: 250 sacks, Type A.
15.5 lbs/gal. slurry
Cemented to: Surface with good returns, displaced with 42.5 bbls water.
Method: Single stage top plug only, bumped with 600 psi.
Equipment: Halliburton Twin T-10 Pumps.
Casing Weight: 48lbs/ft
Grade: H40
Range: 2
Coupling: S.T. & C.

Intermediate Casing

Size: 9 5/8" 24.4 cm.
Set at: 1360' 414.6 m.
Cement: 500 sacks, Type A
15.5 lbs/gal. slurry
Cemented at: Surface with good cement returns.
Method: Displaced with 20 bbls water and 78½ bbls mud. Bumped plug with 850 psi.
Equipment: Halliburton Twin T-10 Pumps.
Casing Weight: 43.5 lbs/ft.
Grade: J55
Range: 3
Coupling: S.T. & C.

Production Casing

Size: 7" 17.8 cm.
Set at: 4 7883' 1488.7 m.
Cement: 450 Sacks Adelaide Construction Cement in a 15.3 lbs/gal. slurry.
Cemented to: Top estimated at 1500 feet.
Method: Displaced with 192 bbls mud. Bumped plug with 2500 psi.
Equipment: Halliburton Twin T-10 Pumps.
Casing Weight: 26x23 lbs/ft.
Grade: N80
Range: 2 and 3
Coupling: Buttress, S.T. & C. and L.T. & C composite string.

3.3.3. Drilling Fluid

A bentonite/water slurry was used to drill to 296 feet. From drilling out of the surface casing to total depth an XP20/Spersene mud with properties approximating:

Weight	9.5 lbs/gal.
Viscosity	35-40 secs. API
Fluid Loss	20ml. above intermediate casing 8ml. below intermediate casing

was programmed.

These properties were basically maintained whilst drilling, the principal problem being with the mud weight constantly creeping up to as high as 9.8 lbs/gal.

3.3.4. Water Supply

Drilling fluid water was pumped from a small dam on Mr. M.J. Rylance's property.

3.3.5. Production Tubing and Perforations

2 7/8" tubing was run inside the production casing. The production casing was perforated from 4751' to 4765' with 4 shots/foot using Go International 2 1/8" jets.

3.3.6. Christmas Tree Details

See Appendix 7.

3.4. Formation Sampling and Testing

3.4.1. Cuttings and Cores

Representative lagged cuttings samples were taken as follows:

Surface to	960'	(292.7m)	every	30'	(9.14m)
	960'	to 1280'		(390.2m)	every 20' (6.10m)
	1280'	to 5068'		(1545.1m)	every 10' (3.05m)

Cuttings were continuously described and the cuttings description log is enclosed as Appendix 2.

Samples were washed clean of drilling mud, bagged and air dried. Cuttings were collected for Beach Petroleum N.L. and The Department of Minerals and Energy.

Additional unwashed samples were taken every 10' to form 100' composites from 2000' to T.D. These unwashed cuttings were sealed in tin cans for head space light hydrocarbon analysis by the B.M.R.

No cores or sidewall cores were cut.

3.4.2. Tests

Three open hole drill stem tests (DST's) and four wireline formation interval tests (FIT's) were run.

Drill Stem Test No. 1

Interval Tested: 4084-4119 feet
Packer Set at: 4084 feet with no cushion
Recovery: 450 feet of mud. The test failed because the packer leaked.
Pressures: at 4074 feet. IH: 2067 PSI
at 4119 feet. IH: 2090 PSI

Drill Stem Test No. 2

Interval Tested: 4066-4119 feet.
Packer Set at: 4066 feet with no cushion.
Recovery: 10 feet of mud. The test failed as the tail pipe became blocked by sand.
Pressures: at 4056 feet IH: 2048 PSI.
FH: 2048 PSI.
at 4119 feet IH: 2090 PSI.
FCIP: 1707 PSI.

Drill Stem Test No. 3

Interval Tested: 4735-4771 feet
Packer Set at: 4735 feet with no cushion.
Recovery: The tool was initially opened for 6 minutes with a strong blow to surface in 30 seconds. The tool was then closed for 30 min. Tool reopened for 59 minutes with an estimated flow of 7 million cubic feet per day. The gas was flared. Tool was then closed for 123 minutes with a rapid pressure build up. Tool was pulled free. No liquid recovery.
Pressures: (a) First Flow Period
at 4725 feet IH: 1.65, 2398 PSI
IF & FF not recorded/mud covered
FCIP: 1.36, 1975 PSI
at 4771 feet IH: 1.71, 2418 PSI

Pressures: (b) Second Flow Period
at 4725 feet IF: 0.94, 1363 PSI
FF: 1.19, 1726 PSI
CIP: 1.36, 1975 PSI
FH: 1.65, 2398 PSI
at 4771 feet FF: 1.40, 1976 PSI
FH: 1.71, 2418 PSI

Formation Interval Test No. 1

Tool was set at 4902 feet
Recovery: 10 litres of muddy water with minor oil scum
and 0.532 cubic feet of gas. Resistivity of
the water was 0.34 ohm-metres at 65^oF.

Formation Interval Test No. 2

Tool was set at 4791 feet
Recovery: 50 cubic feet of gas and 100 millilitres of
condensate cut mud. Gas pressure was 1550
PSI. Resistivity of mud was 1.7 ohm-metre at
74^oF.

Formation Interval Test No. 3

Tool was set at 4778 feet
Recovery: 31.3 cubic feet of gas and 600 millilitres of
muddy water (probably filtrate) with minor
condensate. Gas Pressure was 1550 PSI.
Resistivity of the water was 2.2 ohm-metre at
66^oF.

Formation Interval Test No. 4

Tool was set at 4110 feet
Recovery: 10 litres of water. Resistivity of the water
was 1.43 ohm-metre at 68^oF.

3.5. Logging and Surveys

3.5.1. Mud Logging

A Standard Skid Mounted Exploration Logging (EXLOG) unit was contracted to provide a complete mud logging service. Drill penetration rate, continuous drilling mud gas detection and intermittent cuttings gas analyses were performed and the mudlog is enclosed as Enclosure 1.

3.5.2. Electric Logging

Two open hole logging runs were made by Go International; one prior to 9 5/8" casing at 1360' (414.6m) drillers depth and one at T.D. of 5068' (1545.1m).

Logs Run from 292.30' to 1360': IES-GR-CAL.

(Note: a sonic log was attempted on this run but failed either due to faulty instrumentation or due to the plastic unconsolidated nature of the Gellibrand and Narrawaturk Marls.)

Logs Run from 1360' to 5068' (TD): IES-GR-CAL-SONIC
LL-GR

Logs Run from 4000' to 5033' (Loggers TD): CDL-CNL
MLL-GR-CAL

(2"/100' and 5"/100' scale logs are available for all the above logs. The Selective Formation Tester was run over the test intervals referred to above in Section 2.4.2.

In addition Go International ran their three on-site computer programmed logs; Continuous Cross Plot, Gas Oil Ratio, Well Evaluation Log, at their expense.

3.5.3. Deviation Surveys

During drilling, deviation surveys were run using a SURE SHOT survey instrument. Results were as follows:-

0°	at	100
¼°	at	240
½°	at	800
½°	at	1364
¾°	at	2000
¾°	at	3220
1°	at	3700

3.5.4. Velocity Survey

A velocity survey was run after T.D. logging by Velocity Data Pty. Ltd. Twenty-one shots were taken over seventeen levels in the well. In addition two short surface refraction spreads were shot to obtain near surface (weathering) velocity information.

The report on the velocity survey is included as Appendix 3.

4. POST DRILLING COMPILATION AND LABORATORY STUDIES

4.1. Composite Well Log

A composite well log has been compiled and is included as Enclosure 2.

4.2. Water Analyses

The waters recovered from FIT's 1, 3 and 4 were analysed at the Chemical Branch laboratories of the State Department of Minerals and Energy. (Victoria). Results appear as Appendix 4. Insufficient water was recovered in FIT 2 to allow testing.

4.3. Gas Analyses

The following gas analyses were done;

- (i) On site gas chromatography by EXLOG of the gas recovered on DST 3 and FIT's 1, 2 and 3.
- (ii) A sample collected, in an industrial gas bottle, from DST 3, was analysed by CORELAB in Perth.
- (iii) A sample collected before the separator on production testing was analysed by CORELAB in Perth.

All gas analyses are included as Appendix 5.

4.4. Cuttings Head Space Gas Analysis

The results of the head space light hydrocarbon analyses performed by the BMR on the unwashed canned cuttings are included as Appendix 6.

5. RESULTS OF DRILLING

5.1. General

North Paaratte No. 1 was a new field wildcat well that resulted in a significant gas discovery. An open hole drill stem test (DST-3) over the interval 4735 to 4771 feet (1444 to 1456 m) flowed gas at a rate of 7 MMCFD (198,000 cubic metres) through to 7/16 inch (11 mm) choke. The well was completed with production casing, tubing and a christmas tree as a potential producer. Subsequent production testing flowed gas at a stabilised flow of 9.5 MMCFD (269,000 cubic metres). Further work is required before it can be determined if this well is the discovery well of a commercial field.

5.2. Formation Tops

The following formation tops have been picked using cuttings description, mudlog and electric log data:-

	<u>KB</u>	<u>Subsea</u>
Port Campbell Limestone	31	+284
Gellibrand Marl	264	+51
Clifton Formation	1060	-745
Narrawaturk Marl	1152	-837
Mepunga Formation	1268	-953
Dilwyn Formation	1390	-1075
Pember Mudstone	2198	-1883
Pebble Point Formation	2464	-2149
Paaratte Formation	2632	-2317
Nullawarre Greensand	4095	-3780
Belfast Formation	4373	-4058
Waarre Formation	4753	-4438
Otway Group (?)	5009 (?)	-4694

There is some ambiguity or uncertainty as to the Waarre Formation/Otway Group boundary and it may be possible that the well bottomed in Waarre Formation and did not intersect Otway Group. This ambiguity has arisen for several reasons:-

- (i) The lower at least 42 feet of the well is not logged by any of the electrical tools. i.e. TD of well was 5068 feet, compared with TD of logging runs of 5033 feet and 5039 feet, however due to tool configuration deepest reliable data recorded by electrical lithologic tools is 5026 feet. Accordingly not enough of the possible Otway Group is seen 'electrically' to give a reliable log signature.
- (ii) The boundary is a transitional one as seen under binocular microscope description. As high as 4920 feet the cuttings are altering from an essentially white/light grey colour to a light green/light grey colour. At 4940 feet red brown lithic fragments are beginning to appear with traces of coarse biotite and chlorite. Coarse grained (bronze coloured) biotite becomes more abundant in the interbedded siltstones at 4970 feet as do the red-brown lithics in the associated sandstones. The sandstone below 5010 feet is green and dark grey lithic sandstone which undoubtedly is typical of Otway Group sediments described

in other wells. At this depth, on the resistivity (R(ILD), R(SN)) logs there is no separation below 5014 indicating permeability drop off.

On the basis of cuttings description and the resistivity and gamma ray logs, 5009 feet is the best estimate of top Otway Group.

- (iii) A doubt as to whether complete Waarre Formation has been intersected is raised by the continued left (or negative) SP development below 4754 feet and the similar porosity tools (CDL/CNL/Sonic) response below that level to logging TD. Correlation of this SP log character with the SP log of Port Campbell-4 shows a similar response across the Waarre Formation and suggests that there could be up to 44 feet more Waarre below 5068 feet in North Paaratte-1. (Given same Waarre thickness in both wells).

This evidence however, may be spurious as the curvature of the SP log in the overlying Belfast Mudstone indicates a shale base line shift and this move out effect both in the Belfast and in the Waarre formations may be due to the warping of electro-telluric currents in the 'hydrocarbon' chimney. (H. Crocker personal communication and S.J. Pirson¹.)

In the presence of hydrocarbons the gamma ray log is therefore considered to be more reliable than the SP log.

5.3. Lithologic Description

The lithologies encountered in the well are generalised as follows:-
(all depths are feet below KB)

11 - 31 Clay, yellow-brown, soft.

31 - 264 Port Campbell Limestone

Calcarenite, light grey to medium grey, (top 14' weathered to yellow-white) very fine grained to fine grained (predominantly fine grained), well sorted, common fossil fragments (shell hash, crinoid stems, foraminifera), occasional quartz grains, trace glauconite and pyrite (often as replacement of fossils), moderately hard, very poor visible porosity.

- 264 - 1060 Gellibrand Marl
Marl, medium grey, very soft to soft, fossiliferous. Accessories are shell fragments, foraminifera, crinoid stems, carbonaceous material, glauconite and minor pyrite.
- 1060 - 1152 Clifton Formation
Ironstone Grit, yellow to dark brown, firm to hard, angular, with shell fragments. Lithic grit fragments are angular but with well rounded ironstained quartz grains. Abundant glauconite. Interbedded Claystone, light grey to green, soft with abundant black and green glauconite.
- 1152 - 1268 Narrawaturk Marl
Marl, light brown to light grey, soft to very soft, shelly, strongly pyritic and glauconitic.
- 1268 - 1390 Mepunga Formation
Sandy Marl or Clayey Sand, light brown and brown green, unconsolidated, medium to coarse grained quartz grains, strongly glauconitic, richly fossiliferous, abundant pyrite.
- 1390 - 2198 Dilwyn Formation
- 1390 - 1590 Sandstone, yellow to light brown, iron stained quartz, medium to coarse grained, moderate to well sorted, sub-angular to sub-rounded, loosely consolidated. Good inferred porosity. From 1550-1590 have interbedded Siltstone, dark brown, hard.
- 1590 - 2198 Sandstone, white, medium to coarse grained grading to medium grained down section, well sorted, sub-angular to sub-rounded, loosely consolidated. In places glauconitic and pyrite rich and some shelly sections. The quartz grains are clear, some (minor) smokey quartz. Good inferred porosity interbedded with; Claystone, brown and grey, soft, calcareous, glauconitic with varying percentage of shell fragments. Minor carbonaceous shale and black coal. Towards the base, Sandstone, white to buff, fine to medium grained, cemented, dolomitic and hard.
- 2198 - 2464 Pember Mudstone
Claystone, silty, brown to grey, firm to soft, carbonaceous in part, minor fossil fragments and glauconite. Interbedded with minor Coal, black at top, and Siltstone, brown, dolomitic.

- 2464 - 2632 Pebble Point Formation
Sandstone, with minor Grit, white, coarse to very coarse grained. Quartz has iron staining and green clay mineral staining on micro-fractures interbedded with Sandy Siltstone, dark grey and green, hard, matrix dominant (chamosite?), fine grained quartz. Sandstone is dominant to 2550', Sandy siltstone is dominant below 2550'.
Minor interbedded claystone silty, brown to grey, firm to soft, glauconitic and shale, green, soft, resinous, micaceous.
- 2632 - 4095 Paaratte Formation
- 2632 - 3610 Sandstone, white, medium to coarse grained, loosely consolidated. Quartz is clear to white (smokey-opaque), sub-angular to sub-rounded, moderately sorted with interbedded Shale, black carbonaceous, Coal, black, dull, Chert or indurated Siltstone, medium grey, hard, cryptocrystalline and Sandstone, white to buff, fine grained cemented, dolomitic and hard.
- 3610 - 4095 Above lithologies are present but the dominant lithology is; Clayey Siltstone and Silty Claystone, firm to soft, medium grey, abundant carbonaceous flecks, some glauconite.
- 4095 - 4373 Nullawarre Greensand
Sandstone, light green, medium grained, loosely consolidated sub-rounded well sorted, strongly glauconitic, minor shell fragments. Very good visual porosity. The sandstone is cemented from 4140 to 4190 feet.
- 4373 - 4753 Belfast Mudstone
Siltstone/Claystone, medium grey, soft to firm, slightly carbonaceous and micaceous, richly glauconitic in places with minor interbedded buff dolomite and dolomitic siltstone. Shell fragments increasing towards the base.
- 4753 - 5009 Waarre Formation
Reference to Figure 5 shows five lithologies present within the Waarre Formation.
- LITHOLOGY 1 Sandstone, white to very light grey, medium to coarse grained, sub-rounded to sub-angular, moderately sorted, loosely consolidated. Very good visual porosity. This sandstone occurs in the intervals 4754'-4772', 4774'-4779', 4788'-4806', 4809'-4818', 4820'-4823', 4896'-4903', 4906'-4910', 4988'-5000', 5002'-5009'.

- LITHOLOGY 2 Siltstone, clayey, medium to dark grey, soft, chloritic and or glauconitic, slightly carbonaceous and slightly micaceous. Occurs over intervals 4772'-4774', 4779'-4788', 4806'-4809', 4818'-4820', 4853'-4857', 4876'-4884', 4887'-4896', 4910'-4924', 4975'-4988'. (Note: the siltstone in interval 4975'-4988' contained coarse grained bronze coloured biotite).
- LITHOLOGY 3 Sandstone, white to light grey, cemented, calcareous cement, firm to hard, fine grained, sub-angular, poor to moderate sorting, trace chlorite, carbonaceous matter and lithic fragments. Quartz grains are light grey, Cement is white. Poor visual porosity. Occurs over intervals 4826'4838', 4841'-4849', 4857'-4871', 4884'-4888', 4924'-4945', 4956'-4972'.
- LITHOLOGY 4 Sandstone, white to buff, light brown, fine grained, hard, cemented, dolomitic cement. Forms thin resistive beds as shown in Figure 5.
- LITHOLOGY 5 Coal, black, vitreous, conchoidal fracture. One thin seam from 4874'-4876'.

5009 - 5068 (TD) Otway Group (Undifferentiated)

Interbedded sandstone and siltstone. The transitional boundary with Waarre Formation was discussed in Section 5.2.1.

Sandstone, green, dark grey and brown, medium to coarse grained, sub-angular, poorly sorted, lithic, coarse grained biotite mica, common chloritic and argillaceous matrix. Poor visual porosity.

Siltstone, as for siltstone in Waarre Formation.

APPENDIX - 1

DETAILS OF DRILLING PLANT

4. (a) DRILLING RIG AND EQUIPMENT TO BE FURNISHED BY CONTRACTOR:

Contractor's Rig No.: 12

DRAWWORKS

Ideal type 50 with 16" x 34" spooling drum (1-1/8" lebus grooved) and 14" x 36" 9/16" Sandline drum with foster 24AD and 37AH Catheads and Parkersburg 36" single type R Hydromatic Brake.

MUD PUMPS

National K380. 7 1/4" x 14" powered by GM16V Series 71 engine with K 10 pulsation dampener. National C150B 7 1/4" x 12" with K20 pulsation dampener and powered from compound 71 twin engines.

MIXING PUMP

Mission 5 x 6 Centrifugal pump powered by GM371 diesel engine.

MANIFOLD

Complete Manifold system for circulating mud and water.

ENGINES (DRAWWORKS)

2 GM12107 Series 71 twins with GM torque converters.

DRIVE GROUP

Ideal "BL Modified" 2 engine with #2 having pump countershaft drive (18" PD 10D Sheave).

MAST

131' Lee C. Moore Standard Canti-Lever equivalent to API Derrick capacity of 550,000 lbs. Racking capacity 12420' 4 1/2" drill pipe.

SUBSTRUCTURE - MAST

Lee C. Moore 10' high x 20' 9" wide x 31' long.

SUBSTRUCTURE-ENGINE

Lee C. Moore 10' high x 20' 9" wide x 11' 9" long.

INSTRUMENTATION

Martin Decker Type D Weight Indicator with 0/3000 lbs. mud pump gauge. Martin Decker tong torque gauge. Geograph G3 Recorder.

KELLY COCK

1 Omsco unit with 6-5/8" LH Box up x 6-5/8" LH pin down.

DE-SANDER

Cyclone unit with 3 x 6" and 2" x 8" cones and mission 5 x 6 centrifugal pump powered by GM371 engine.

DEVIATION INSTRUMENT

Sure Shot 0° - 7° unit.

Oh

BLOWOUT PREVENTERS

1-12 3000 psi WP Cameron "SS" Double gate with C.S.O. & 4½" Rams.
1-12 3000 psi WP Hydril
1-K80 Hydril Accumulator with 2 Nitrogen Bottle emergency closing system
1-Set BOP Hoses and steel lines (latter installed in walkways)

DRILL PIPE

6000' - 4½" OD x 16.60 lb/ft grade E Range 2 with 4½" FH connections.
6 Joints - 4½" Hevi-Wate

DRILL COLLARS

6-8" OD x 30' with 6-5/8" regular connections.
18-6½" OD x 30' with 4½" IF connections.

CHOKE MANIFOLD

1-5000 psi dual choke unit

ROTARY TABLE

Ideal type 20½" complete with master bushing

TRAVELLING BLOCK AND HOOK

National 436 'E' 140 rated capacity 140 tons.

CROWN BLOCK

Lee C. Moore with 5 x 42" OD and 1 x 56" OD sheaves

SWIVEL

National Ideal Type 'D'

GENERATORS, COMPRESSORS AND CIRCULATING PUMP (Installed in Generator House)

2 Delco-GM 92.5 KVA generators powered by GM671 engines.
2 Ingersoll Rand air compressors.
2 Southern x 1½" x 2" centrifugal water pump powered by electric motor.

SHALE SHAKER

2 Link belt type NR145 model 53A.

RIG LIGHTING

Hutchinson "Flo-Light" flame-proof complete for National 50 rig and Lee C. Moore Mas

MUD TANKS

2 Mild Steel with walk partitions and guns - each 30' x 8' x 6' high.

WATER TANKS

2 mild steel each 30' x 8' x 6' high.

PIPE RACKS AND WALK

90 ft Tumble type pipe racks complete with steel decked walk.

FISHING TOOLS

1 set Bowen or McCullough Mechanical Hydraulic Jars.
Overshot to catch Drill Pipe and 6½" Drill Collars
Overshot to catch 8" Drill Collars.

SPOOLS

As required to cross over between Contractors BOP's and Operators Casing BOP's.

SHEDS

- 1 Dog House 14' x 8'
- 1 Generator shed 24' x 8'
- 1 Utility Shed 27' x 8'
- 1 Spares/Tool shed 26' x 8'

MUD TESTING EQUIPMENT

Magco bar rig laboratory

WELDING EQUIPMENT

- Oxy/acetylene set
- 1 H6 Lincoln electric set

CASING AND DRILL PIPE HANDLING TOOLS:

- 1 set (2) Tongs with jaw range 3½" - 13-3/8"
- 2 Sets 4½" drill pipe slips
- 1 Set 5½" - 7" drill collar slips
- 1 Set 6-3/4" - 8½" drill collar slips
- 1 Set 7" Casing Slips
- 1 Set 9-5/8" Casing Slips
- 1 Set 13-3/8" Casing Slips
- 1 Set CR drill collar safety clamps
- 2 Sets 4½" Drill pipe Elevators
- 1 Set 7" Casing Elevators (single joint)
- 1 Set 7" Casing Elevators (running)
- 1 Set 9-5/8" Single Joint Casing Elevator
- 1 Set 9-5/8" Casing Elevator (running)
- 1 13-3/8" Single Joint Casing Elevator
- 1 13-3/8" Casing Elevator (running)
- 1 Set each 2-7/8" Tubing Elevators & Slips

ELEVATOR LINKS

- 1 Set 2½" x 72" 110 ton capacity
- Set 2-3/4" x 84" 150 ton capacity

SUBSTITUTES

All necessary lifting, crossover and bit substitutes for 4½" drill pipe; 6" & 8" drill collars, and drill collars to other down hole tools furnished by Contractor with National 50 rig.

KELLY AND KELLY DRIVE

- 1 4½" Square Kelly with 6-5/8" LH Box Up
- 1 Baash Ross 2RBS6 Kelly Drive

JUNK BOX

Skid Mounted 14' x 8' x 4'

RATHOLE DRILLER

Unit Rig digger with drive for 4½" square kelly.

MUD SAVER

"OKEH" mud saver bucket for 4½" drill pipe.

TTING

Hardwood matting for National 50 Sub-base and pump area.

DAY TANK

- 1 - 2000 gallon diesel day tank

FIRE EXTINGUISHERS

- 1 Set as required to comply with State Mines Department Regulations.

APPENDIX - 2

WELL SITE CUTTINGS DESCRIPTION LOG

DESCRIPTIVE CUTTINGS LOG

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
11-31	100	Clay, yellow-brown, soft. At base, Limestone (calcarenite) boulders.	
31-45	100	Calcarenite, yellow-white and medium grey, firm, abundant quartz sand grains, trace crinoid stems, some intergranular porosity.	
45-60	100	Calcarenite, light grey-grey, firm-hard, very fine to fine grained (dominantly fine grained), well sorted, occasional quartz sand grains, trace glauconite, pyrite (often as replacement of fossils), common fossil fragments, (shell hash, crinoid stems, foraminifera), very poor visible porosity.	
60-90	100	Calcarenite, as above.	
90-120	100	Calcarenite, as above.	
120-150	100	Calcarenite, as above.	
150-180	100	Calcarenite, as above.	
180-210	100 Tr	Calcarenite, as above. Siltstone, grey-dark grey, 70% clay marl, 30% quartz silt moderately hard.	
210-240	100 Tr	Calcarenite, as above. Marl, dark grey, very soft-soft.	
240-264	100 Tr	Calcarenite, as above. Marl, as above	
264-270	100	Marl, medium grey-dark grey, very soft-soft, fossiliferous. Accessories are shell fragments, foraminifera, crinoid stems, (minor pyritisation), carbonaceous material and glauconite.	
270-296	100	Marl, as above. Set 13 3/8" casing at 292', drill ahead with 12 1/4".	
296-330		Marl, as above.	
330-360		Marl, as above. (<u>Globigerina</u>)	
360-390		Marl, as above.	
390-420		Marl, as above. Trace pyrite, shell fragments, minor turreted gastropoda, carbonaceous matter and glauconite not detected.	
420-450		Marl, as above. Trace pyrite, shell fragments, crinoid stems, foraminifera, corals.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
450-480		Marl, as above as for 420-450. (<u>Quinqueloculina</u> , <u>Pyrgo</u>).	
480-510		No sample; By Pass Shakers.	
510-540		Marl, as above, pyrite abundant, shell fragments. Sample taken from flowline.	
540-570		No sample, By Pass Shakers; non-representative samples of this section taken from Flowline. Have cave-ins. Still in Marl section.	
570-600	100	Marl, as above, trace carbonaceous matter. Very small sample collected from flowline.	
600-630	100	Marl, dark grey, soft to very soft, shelly. Strongly calcareous, shell fragments \geq 50%, shells seem more abundant in this sample. Previous samples have been clay dominant. This could be subjective and dependent upon shaker caught sample or sample collected from flowline. This sample was caught across shakers. Note: minor turreted gastropoda.	
630-660	100	Marl, as above. idem 600-630' c trace pyrite.	
660-690	100	Marl, as above. dark grey-blue grey, 40% clay minerals, 60% fossil material, shell fragments, echinoid stems, abundant forams, trace quartz siltstone, trace pyrite, soft-very soft, corals. (<u>Fenestrella</u>), turreted gastropods.	
690-720	100	Marl, as above.	
720-750	100	Marl, as above.	
750-780	100	Marl, as above.	
780-810	100	Marl, as above.	
810-840	100	Marl, as above, trace siltstone, white, firm to hard.	
840-870	100	Marl, as above, trace siltstone as above, more clayey.	
870-900	100	Marl, light grey-green, soft, shelly, strongly calcareous, shell fragments \geq 50%, foraminifera, coral fragments, turreted gastropods.	
900-930	100	Marl, light grey-green, as above.	
930-960	100	Marl, as above for 870-900	
960-980	100	Marl, as above for 870-900 trace siltstone, light grey, firm to hard.	
980-1000	100	Marl, as above for 870-900	
1000-1020	100	Marl, as above for 870-900, trace yellow claystone.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1020-1040	100	Marl, light grey-green as above. Trace glauconite, trace yellow claystone/siltstone (weathered material).	
1040-1060	100	Marl, light grey-green, as above. Trace glauconite, trace carbonaceous material and trace yellow claystone (weathered material), carbonaceous material is moderately abundant.	
1060-1080	40 20 20 20 trace +	Yellow, firm-hard, angular, ironstone-grit. Dark brown, hard, ironstone-grit, angular c̄ glauconite grains. Marl, light grey-green as above. Shell fragments, echinoid stems etc. Light yellow-brown, ironstained, coarse grained quartz, well rounded.	
1080-1100	60 20 10 10 trace +	Grit, coarse grained, angular, white quartz c̄ medium grained angular included iron minerals. Marl, light grey-green as above. Shell fragments. Ironstone-grit, yellow, firm-hard, angular. Light yellow-brown, ironstained, coarse grained quartz, well rounded.	
1100-1120	30 10 30 10 trace	Shell fragments, (echinoid stems, corals, foraminifera) Quartz grains, light yellow-brown, iron-stained, coarse grained-very coarse grained, well rounded. Claystone, light grey-green, with abundant black and green glauconite. Ironstone grit, yellow-brown and dark brown. Yellow, firm, angular ironstone grit.	
1120-1140	80 20 trace	Claystone, light grey-green, with abundant black and green glauconite. (glauconite up to 10% of whole sample). Shell fragments. Yellow, firm, angular, ironstone grit.	
1140-1160	100 trace	Marl, light grey-light brown, soft-very soft, shelly c̄ up to 5% glauconite content. Yellow, firm, angular, ironstone grit.	
1160-1180	100 trace	Marl, as above (1140-1160). Pyrite, trace dark brown grit.	
1180-1200	100	Marl, light brown-light grey, soft-very soft, shelly, strongly pyritic and glauconitic.	
1200-1220	95 5	Marl, light brown-light grey, soft, shell fragments, strongly pyritic, moderately glauconitic. Quartz, coarse grained to very coarse grain, yellow brown stained. Note: pyrite is coarse grained and up to 5%, glauconite is medium grained.	
1220-1240	100 trace	Marl as above, pyritic, glauconitic as above. Some large gastropoda. Quartz as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1240-1260	100 trace	Marl, as above. Quartz, as above.	
1260-1280	100	Sand, glauconitic, clayey, shelly, pyritic, light brown. Clay 40% Glauconite 20%, medium-coarse grained. Shells 30%, coarse grain-very coarse grain and granule. Large gastropoda, coral fragments. Pyrite 5%, fine grain to coarse grain. Quartz 5% coarse grain to very coarse grain, yellow-brown stained and white amorphous and light yellow-white quartzite.	
1280-1290	100	Claystone, light brown, silty, shelly, glauconitic, pyritic, moderately calcareous. Clay and Silt 60%, Shells and shell fragments 25%, Glauconite 10%, Pyrite 5%.	
1290-1300	X	No sample, bad cave-ins.	
1300-1310	100	Sand, brown-green, medium-coarse grain, poorly sorted, clayey silty, shelly, glauconitic and pyritic, strongly calcareous. Glauconite 35%, Shells 30%, Clay and Silt 30%, Pyrite 5%, Quartz trace.	
1310-1320	100	Clayey Sand as above (1300-1310)	
1320-1330	100	Clayey Sand as above.	
1330-1340	100	Clayey Sand as above.	
1340-1350	100	Clayey Sand as above.	
1350-1360	100	Clayey Sand as above.	
1360-1364	100	Clayey Sand as above.	
1364-1370	100	Clayey Sand as above, Sample heavily contaminated with cement.	
1370-1380	70	Clayey Sand, brown-green, medium-coarse grain, poorly sorted, strongly glauconitic. 35% Glauconite, 50% Shells, 15% Quartz. Quartz is citrine (y) sub-rounded to angular, some quartz c crystal faces.	
	30	Marl. light brown-light grey, soft, shelly, moderately glauconitic.	
1380-1390	90	Sand, brown-green, medium-coarse grain. moderately sorted, strongly glauconitic. Shell fragments 20% and more quartzose. Quartz 50%. Glauconite 30% - Sand fraction trace pyrite Clay % washed out and difficult to assess.	
	10	Marl, as above. (Sample still badly contaminated c cement)	
1390-1400	100	Sand, as above. (1380-1390)	
1400-1410	100	Sand, yellow light brown (citrine quartz), coarse grain, moderate to well sorted (minor medium grained), unconsolidated sub-angular, glauconite 10%, coarse grain, well rounded. Shell fragments 10%.	
	trace	Marl, as above.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1410-1420	100	Sand, yellow light brown, (citrine quartz) medium-coarse grain, moderate to well sorted, unconsolidated, sub-angular to sub-rounded. Glauconite 5%, coarse grain, well rounded.	
	trace	Marl as above, shell fragments.	
1420-1430	100	Sand, as above.	
	trace	Marl, as above.	
1430-1440	100	Sand, as above. Glauconite 5%, shell fragments 10%.	
	trace	Marl, as above. Slightly calcareous cemented, firm siltstone and cemented fine grain glauconitic sandstone.	
1440-1450	100	Sand, as above.	
	trace	Cemented slightly calcareous fine grain, glauconitic sandstone.	
1450-1460	100	Sand, as above.	
	trace	Cemented, slightly calcareous, fine grain, glauconitic sandstone.	
1460-1470	100	Sand, as above. Glauconite a trace only.	
1470-1480	100	Sand, yellow-light brown, (citrine quartz) medium grain, (minor coarse grain) moderate to well sorted, unconsolidated, sub-rounded to sub-angular.	
	trace	Cemented, slightly calcareous, fine grained, glauconitic sandstone.	
	trace	Dark brown-black, cemented siltstone.	
	trace	Pyrite.	
1480-1490	100	Sand, as above.	
	trace	Pyrite.	
	trace	Glauconite	
	trace	Dark brown-black, cemented siltstone.	
1490-1500	100	Sand, as above.	
	trace	Trace accessories as above plus.	
	trace	Cemented, medium grey, slightly calcareous siltstone.	
1500-1510	100	Sand, as above.	
	trace	Accessories as for 1490-1500.	
1510-1520	100	Sand, as above.	
	trace	Accessories as for 1490-1500.	
1520-1530	100	Sand, as above.	
	trace	Accessories as for 1490-1500.	
1530-1540	100	Sand, as above.	
	trace	Accessories as for 1490-1500.	
1540-1550	100	Sand, yellow (citrine quartz) medium grain, (minor coarse grain) well sorted, unconsolidated sub-rounded to sub-angular.	
	trace	Glauconite, medium-coarse grain, well rounded.	
1550-1560	70	Sand, as above.	
	30	Siltstone, dark brown, hard, indurated.	
1560-1570	70	Sand, as above.	
	30	Siltstone, dark brown, firm-hard, indurated.	
	trace	Glauconite, pyrite, shell fragments.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1570-1580	80 20 trace	Sand, yellow and clear, medium grain, well sorted unconsolidated Siltstone, dark brown, hard indurated. Claystone, dark brown, soft.	
1580-1590	80 20 trace trace	Sand, as above for 1570-1580. Siltstone, dark brown, hard, indurated. Claystone, dark brown, soft. Glauconite.	
1590-1600	100 trace	Sand, white-translucent, medium-coarse grain, well sorted, unconsolidated. Pyrite, glauconite, foraminifera.	
1600-1610	100 trace trace trace trace	Sand, white-translucent, medium-coarse grain, well sorted, unconsolidated, sub-rounded. Pyrite, glauconite, shell fragments. Siltstone, brown, hard, indurated. Claystone, dark brown, soft. Sandstone, white, fine grain, cemented, glauconitic.	
1610-1620	100 trace	Sandstone, as above. Glauconite, pyrite, shell fragments, siltstone.	
1620-1630	90 5 5 trace	Sandstone, as above. Siltstone, dark brown, firm. Claystone, dark brown, soft. Pyrite.	
1630-1640	90 10 trace	Sandstone, as above, 5% glauconite (green and brown) Claystone, dark brown, soft, calcareous. Shell fragments and pyrite.	
1640-1650	70 30 trace	Sandstone, as above. (5% shell fragments, 5% glauconite). Claystone, dark brown, soft, calcareous or Marl. Foraminifera.	
1650-1660	80 10 5 5	Sandstone, as above. Claystone, dark brown and light green, soft, calcareous, trace fine grain glauconite. Claystone, silty, yellow. Shells and shell fragments.	
1660-1670	85 10 trace trace trace 5	Sandstone, as above. Shells and shell fragments. White, fine grain, cemented sandstone. Foraminifera. Claystone, silty, yellow. Claystone, dark brown, soft calcareous, trace, fine grain, glauconite.	
1670-1680	65 20 15 trace	Sandstone, as above, medium grain. Siltstone, brown and light grey, soft. Shell fragments. Foraminifera, pyrite, glauconite.	
1680-1690	100 trace	Sandstone, medium-coarse grain, predominantly medium grain, well sorted, sub-angular to sub-rounded, unconsolidated white-translucent. Pyrite, glauconite, iron minerals.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1690-1700	100	Sandstone, as above.	
	trace	Pyrite, glauconite, iron minerals. Note: some quartz grains have pyritic cement.	
	trace	Siltstone, dark brown, soft.	
1700-1710	70	Sandstone, as above.	
	15	Shell fragments.	
	15	Glauconite	
	trace	Claystone, dark brown, soft, calcareous, trace fine grain glauconite.	
1710-1720	30	Claystone, as above.	
	20	Clayey Sandstone, light grey.	
	30	Sandstone, as above.	
	trace	Shell fragments, glauconite.	
1720-1730	100	Sandstone, as above.	
	trace	Pyrite, glauconite (up to 5% each of Sandstone component)	
1730-1740	80	Sandstone, as above.	
	20	Claystone, dark brown and grey, soft, calcareous, glauconitic.	
	trace	Pyrite, glauconite.	
	abundant	Shell fragments.	
1740-1750	90	Sandstone, shelly, glauconitic, medium grain, moderate to well sorted, shells 15%, glauconite 15%, quartz is clear and also citrine yellow, trace pyrite.	
	10	Claystone, as above.	
1750-1760	80	Sandstone, as above.	
	20	Claystone, as above.	
1760-1770	90	Sandstone, as above.	
	10	Claystone, as above.	
1770-1780	80	Sandstone, as above.	
	20	Claystone, as above.	
1780-1790	80	Sandstone, as above.	
	20	Claystone, as above.	
1790-1800	100	Sandstone, white, medium grain, well sorted, sub-angular to sub-rounded, unconsolidated. Some quartz grains clear, some smokey quartz. Up to 5% glauconite.	
	trace	Pyrite, iron minerals, citrine quartz.	
1800-1810	100	Sandstone, as above.	
	trace	Claystone, as above.	
1810-1820	90	Sandstone, glauconitic, pyritic, medium grain, moderate to well sorted, sub-angular to sub-rounded (glauconite + pyrite = 20%). Quartz translucent, white-clear.	
	10	Claystone, as above.	
1820-1830	80	Sandstone, as above, up to 5% citrine quartz.	
	20	Claystone, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1830-1840	100	Sandstone, white-clear quartz, medium grain, moderate to well sorted, sub-rounded, unconsolidated.	
	trace	Pyrite, glauconite and claystone as above, shell fragments, foraminifera.	
1840-1850	100	Sandstone, as above.	
	trace	Accessories, as above.	
1850-1860	100	Sandstone, as above.	
	trace	Accessories, as above.	
1860-1870	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	Cemented, fine grain, glauconitic sandstone.	
	trace	Accessories, as above.	
1870-1880	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	Shell fragments, siltstone.	
1880-1890	100	Sandstone, as with 1870-1880, trace Claystone	
1890-1900	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	glauconite, pyrite, shell fragments.	
1900-1910	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	Lithic fragments (chlorite?) glauconite, shell fragments, citrine quartz.	
1910-1920	90	Sandstone, as above. (5% glauconite)	
	10	Claystone, light grey, soft, calcareous, lithic fragments, glauconite.	
	trace	Shell fragments, foraminifera, pyrite.	
1920-1930	65	Claystone/Marl, as above.	
	35	Sandstone, as above.	
1930-1940	50	Sandstone, as above.	
	50	Claystone/Marl, as above.	
	trace	Glauconite, chlorite?, shell fragments.	
	trace	Pyrite, pyrrhotite?	
1940-1950	70	Sandstone, as above.	
	30	Claystone/Marl, as above.	
	trace	Siltstone, dark brown.	
	trace	Pyrite, shell fragments. (Pyrite up to 5% strongly pyritic).	
1950-1960	70	Claystone/Marl, as above. 10% glauconitic.	
	30	Sandstone, as above.	
	trace	Citrine quartz.	
1960-1970	80	Sandstone, as above.	
	20	Claystone/Marl, as above.	
	trace	Glauconite, pyrite, shell fragments, smokey and citrine quartz.	
1970-1980	90	Sandstone, as above.	
	10	Claystone/Marl, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
1980-1990	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	Pyrite, glauconite, shell fragments.	
1990-2000	80	Sandstone, as above.	
	20	Claystone, as above.	
	trace	Coal, black, brittle, dull subvit. lustre. some mineral fluorescence.	
2000-2010	90	Sandstone, as above.	
	10	Claystone, as above.	
	trace	Shale, carbonaceous and pyritic.	
	abundant	Pyrite.	
2010-2020	80	Sandstone, as above.	
	10	Pyrite.	
2020-2030	trace	Shale, carbonaceous and pyritic.	
	10	Claystone, as above.	
	95	Sandstone, white, medium-coarse grain, well sorted, sub-rounded, loosely consolidated.	
2030-2040	trace	Pyrite, glauconite.	
	trace	Claystone.	
	5	Shale, black, carbonaceous, pyritic.	
	trace	Sandstone, cemented, coarse grain quartz with siliceous cement.	
2040-2050	90	Sandstone, as above.	
	10	Claystone, dark brown, firm to soft, silty.	
2050-2060	90	Sandstone, as above.	
	10	Claystone, as above.	
2060-2070	100	Sandstone, as above.	
	trace	Claystone, as above.	
	trace	Pyrite, glauconite.	
2070-2080	90	Sandstone, as above.	
	5	Glauconite.	
	5	Siltstone, firm-hard, dark grey-green.	
	trace	Cemented sandstone, fine grain.	
2080-2090	80	Sandstone, as above.	
	20	Siltstone and silty claystone, dark grey-brown.	
	trace	Glauconite.	
2090-2100	90	Sandstone, as above.	
	10	Siltstone and silty claystone, as above.	
	trace	Glauconite.	
	trace	Fine-medium grain, cemented sandstone, coarse grained with fine grained quartz matrix.	
2090-2100	90	Sandstone, as above.	
	10	Cemented sandstone, coarse grain, but matrix dominant, cemented by pyrite and silica.	
	trace	Pyrite, coarse grain.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2100-2110	90	Sandstone, as above.	
	10	Siltstone, dark brown, firm-hard.	
	trace	Glauconite.	
2110-2120	70	Sandstone, as above.	
	30	Sandy claystone, dark brown, firm to hard.	
	trace	Carbonaceous shale, black.	
2120-2130	85	Sandstone, as above.	
	10	Sandy claystone, as above.	
	5	Cemented hard sandstone, quartz grains coarse grain, cement hard dolomitic and matrix dominant.	
2130-2140	90	Sandstone, as above.	
	5	Cemented hard sandstone, as above.	
	5	Black carbonaceous shale.	
2140-2150	90	Sandstone, as above.	
	5	Cemented hard sandstone, as above.	
	5	Black carbonaceous shale.	
2150-2160	90	Sandstone, as above.	
	10	Siltstone, hard, dark brown.	
	trace	Siltstone, hard, dark brown.	
2160-2170	95	Sandstone, as above.	
	5	Siltstone, as above.	
2170-2180	90	Sandstone, as above.	
	5	Siltstone, as above.	
	5	Sandy claystone, dark brown, firm to hard.	
2180-2190	75	Sandstone, as above.	
	25	Carbonaceous shale, black, pyritic.	
	trace	Cemented, hard sandstone, quartz grains, coarse grain, cement, hard dolomitic and matrix dominant.	
2190-2200	70	Sandstone, as above.	
	20	Carbonaceous shale, black, pyritic.	
	10	Dolomitic sandstone, matrix dominant, cement is dolomitic. sandstone quartz grains fine-medium grain.	
2200-2210	90	Sandstone, as above.	
	10	Black, carbonaceous shale, as above.	
	trace	Dolomitic, sandstone.	
2210-2220	90	Sandstone, as above.	
	10	Black, carbonaceous shale, as above.	
	trace	Shale, green, resinous, micaceous.	
2220-2230	90	Sandstone, as above.	
	10	Black carbonaceous shale, as above.	
	trace	Black coal, dull.	
2220-2230	trace	Pyrite, shell fragments.	
	trace	Claystone, brown, soft, calcareous.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2230-2240	80	Sandstone, white, medium-coarse grain, moderately sorted, sub-rounded, loosely consolidated.	
	10	Black carbonaceous, shale, as above.	
	10	Shells and shell fragments.	
	trace	Shale, green, resinous, micaceous.	
	trace	Claystone, as above.	
2240-2250	30	Siltstone, medium-brown, hard, non-calcareous, glauconitic dolomitic.	
	60	Sandstone, as above. pyritic cement.	
	10	Black, carbonaceous shale, as above.	
	trace	Pyrite.	
2250-2260	80	Sandstone, as above (as for 2260-70)	
	20	Siltstone, medium-brown, hard, dolomitic, glauconitic.	
	trace	Dolomitic sandstone, as above.	
2260-2270	80	Sandstone, white, medium-coarse grain, poorly sorted, sub-rounded to sub-angular, loosely consolidated.	
	20	Siltstone, dolomitic, as above.	
	trace	Pyrite, coarse grain, iron stained quartz.	
2270-2280	70	Sandstone, as above. quartz grains are gradually getting dirtier.	
	30	Silty sandstone, dolomitic, glauconitic. (Suspect matrix of dolomite cement in the sandstone lithology).	
	trace	Pyrite.	
2280-2290	75	Sandstone, as above.	
	20	Silty, sandstone, brown dolomitic, glauconitic, as above.	
	5	Black coal.	
2290-2300	trace	Pyrite.	
	50	Sandstone, as above.	
	20	Silty, sandstone, dolomitic, glauconitic, as above.	
2300-2310	30	Claystone, brown-grey, firm-soft, glauconitic.	
	trace	Siltstone, clayey, yellow and red-brown.	
	trace	Pyrite.	
2310-2320	80	Claystone, silty, brown-grey, soft, glauconitic.	
	10	Silty sandstone, light brown, dolomitic, glauconite.	
	10	Sandstone, as above.	
	trace	Pyrite, iron-stained quartz, siltstone, clayey and yellow.	
2320-2330	60	Claystone, as above.	
	10	Pyrite, coarse grain.	
	20	Sandstone, coarse grain, poorly sorted, white, sub-angular to sub-rounded, loosely consolidated.	
	10	Silty sandstone, light brown, dolomitic, glauconitic.	
2330-2340	50	Claystone, as above.	
	20	Silty sandstone, light brown, dolomitic, glauconitic.	
	30	Sandstone, as above, medium-coarse grain.	
	trace	Pyrite, shell fragments, glauconite.	
2330-2340	40	Claystone, as above.	
	40	Sandstone, as above.	
	10	Silty sandstone, light brown, dolomitic, glauconitic.	
	10	Shells and shell fragments.	
	abundant	Pyrite	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2340-2350	60	Claystone, as above.	
	30	Sandstone, as above.	
	5	Pyrite.	
	5	Shells and shell fragments.	
	trace	Silty sandstone, light brown, dolomitic, glauconitic.	
	trace	Iron-stained quartz.	
2350-2360	70	Claystone, as above.	
	10	Sandstone, as above.	
	10	Shells and shell fragments.	
	10	Silty sandstone, light brown, dolomitic, glauconitic.	
	abundant	Pyrite.	
2360-2370	85	Sandstone, medium-coarse grain, poorly sorted, green-white, moderately rounded, loosely consolidated, glauconitic (10-15%), pyritic.	
	5	Black, carbonaceous shale.	
	10	Silty sandstone, as above.	
2370-2380	85	Sandstone, as above.	
	5	Black, carbonaceous shale, as above.	
	10	Silty, sandstone, as above.	
2380-2390	90	Sandstone, medium-coarse grain, moderate to well sorted, white, moderately rounded, loosely consolidated, glauconitic 5%, pyrite abundant.	
	10	Silty sandstone, as above.	
	trace	Black, carbonaceous shale.	
2390-2400	20	Silty sandstone, as above.	
	80	Sandstone, medium-coarse grain, mainly medium grain, moderately sorted, loosely consolidated, green-white, glauconitic (20%), pyritic.	
	trace	Shell fragments	
	trace	Red-brown lithic, iron rich fragments.	
2400-2410	35	Silty sandstone, as above.	
	65	Sandstone, as above, (for 2390-2400), glauconitic (20%).	
2410-2420	100	Sandstone, green-brown-white, medium-coarse grain, moderately sorted, cemented, matrix up to 50% consists of silty dolomitic material, hard, glauconite up to 30%, quartz, sub-angular to sub-rounded.	
2420-2430	100	Sandstone, as above.	
2430-2440	100	Sandstone, as above, matrix down to 25-30%	
	trace	Pyrite.	
	trace	Shale, green, resinous lustre, micaceous.	
2440-2450	100	Sandstone, as above, matrix down to 20%	
	trace	Pyrite.	
2450-2460	95	Sandstone, white, medium-coarse grain, moderate to well sorted, sub-rounded to moderately rounded, loosely consolidated, quartz is clear but becoming dirty \bar{c} iron-staining in microfractures.	
	5	Claystone, silty, brown-grey.	
	trace	Dolomitic siltstone, medium brown.	
	trace	Claystone, silty, yellow.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2460-2470	95 5	Sandstone, as above, glauconitic (up to 5%). Claystone, as above.	
2470-2480	100	Sandstone, white, coarse grain to very coarse grain, (minor grit) moderate to poor sorting, sub-rounded. Quartz has iron-staining and chamosite staining on microfractures. Some sand size grains are quartzite and/or lithic.	
2480-2490	100	Sandstone, as above, but now medium-coarse grain, minor very coarse grain, sub-rounded to moderately rounded.	
	trace	Shale, dark grey-green, firm to hard.	
2490-2500	100	Sandstone, as above. (as for 2480-90).	
	trace	Shale, as above.	
	trace	Very coarse grain, smokey quartz.	
2500-2510	100	Sandstone, as above (as for 2480-2490)	
	trace	Shale, as above.	
	trace	Very coarse grain, smokey quartz.	
	trace	Shale, resinous, micaceous, green.	
2510-2520	95	Sandstone, as above.	
	5	Claystone, silty, dolomitic, dark grey and green.	
	trace	Claystone, as above. as cement to the quartz grains.	
2520-2530	90	Sandstone, as above, moderately sorted, medium grain, sub-rounded, quartz grains still iron-stained.	
	10	Claystone, as above.	
	trace	Shale, resinous, micaceous, green.	
	trace	Pyrite.	
2530-2540	85	Sandstone, as above for 2520-30.	
	15	Claystone, as above.	
	trace	Shale, resinous, micaceous, green.	
	trace	Cemented, dolomitic, brown-green, sandstone.	
2540-2550	80	Sandstone, as above for 2520-30.	
	20	Claystone, as above.	
	trace	Shale, resinous, micaceous, green.	
	trace	Cemented dolomitic, brown, green, sandstone.	
	trace	Very coarse grain, smokey quartz.	
2550-2560	50	Sandstone, yellow-white, medium grain - very coarse grain, poorly sorted, sub-rounded, quartz grains still iron-stained.	
	50	Sandy siltstone, green matrix dominant, quartz is fine grain, matrix is green (chamositic), hard.	
	trace	Pyrite.	
2560-2570	70	Sandstone, as above, quartz is more iron-stained and yellow-brown.	
	20	Sandy siltstone, as above.	
	10	Sandstone, fine-medium grain, cemented, lithology as for sandy siltstone but less matrix.	
2570-2580	85	Sandstone, as above.	
	15	Sandy siltstone, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2580-2590	90	Sandstone, as above.	
	10	Sandy siltstone, as above.	
2590-2600	90	Sandstone, yellow-white, medium-coarse grain, (minor very coarse grain), poorly sorted, sub-rounded, quartz grains still iron-stained.	
	10	Sandy siltstone, grey and green.	
	trace	Red quartzite, pyrite.	
2600-2610	90	Sandstone, as above.	
	10	Sandy siltstone, dark grey and green.	
	trace	Red quartz, pyrite, black shale.	
2610-2620	90	Sandstone, yellow-white, coarse grain-very coarse grain, moderately sorted, subrounded to sub-angular, loosely consolidated.	
	10	Sandy siltstone, dark grey and green.	
2620-2630	80	Sandstone, yellow-white and clear, medium-coarse grain, poorly sorted, moderately rounded.	
	10	Sandy siltstone, dark grey and green.	
	10	Black carbonaceous shale	
	trace	Pyrite. Note: Mixed lithotypes, drilling break at 2632' indicates the new formation with downhole contamination, of Pebble Point lithotypes.	
2630-2640	80	Sandstone, as above.	
	10	Sandy siltstone, as above.	
	10	Black, carbonaceous shale, as above.	
2640-2650	100	Sandstone, white, medium-very coarse grain, moderately to poorly sorted, sub-angular to sub-rounded. Quartz is clear to white smokey opaque.	
	trace	Black, carbonaceous shale, as above, firm to hard.	
	trace	Sandy siltstone, as above.	
2650-2660	90	Sandstone, as above.	
	10	Black, carbonaceous shale, with pyrite.	
2660-2670	90	Sandstone, as above.	
	10	Black, carbonaceous shale, as above.	
	trace	Pyrite.	
2670-2680	90	Sandstone, as above.	
	10	Black, carbonaceous shale, as above.	
	trace	Pyrite.	
2680-2690	90	Sandstone, as above.	
	5	Black, carbonaceous shale, as above.	
	5	Chert or indurated siltstone, medium grey, cryptocrystalline, extremely hard.	
2690-2700	90	Sandstone, as above.	
	5	Black, carbonaceous shale, as above.	
	5	Chert or indurated siltstone, medium grey, as above.	
	trace	Light brown quartzite or chert.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2700-2710	90	Sandstone, as above.	
	5	Black, carbonaceous shale, as above.	
	5	Chert or indurated siltstone, medium grey and green, as above.	
2710-2720	90	Sandstone, as above.	
	10	Chert or indurated siltstone, light grey, brown, trace red-brown.	
2720-2730	90	Sandstone, white, medium-coarse grain, predominantly medium grain, moderately sorted, sub-angular to sub-rounded quartz is clear to white smokey opaque.	
	5	Black, carbonaceous shale, as above.	
	5	Chert or indurated siltstone, brown, red-brown, extremely hard.	
2730-2740	90	Sandstone, white, medium-coarse grain, occasional very coarse grain, moderate to poorly sorted, sub-angular to sub-rounded. Quartz is clear to white smokey opaque.	
	5	Black, carbonaceous shale, as above.	
	5	Chert or indurated siltstone, brown, red-brown, light grey.	
2740-2750	85	Sandstone, as above.	
	5	Black, carbonaceous shale, as above.	
	10	Indurated siltstone or chert, light grey, light green, brown red-brown.	
2750-2760	90	Sandstone, as above.	
	10	Chert or indurated siltstone, light grey, light green, brown and red-brown.	
	trace	Black, carbonaceous shale, as above.	
2760-2770	90	Sandstone, as above.	
	10	Chert, as above.	
	trace	Black, carbonaceous shale, as above.	
2770-2780	90	Sandstone, as above.	
	5	Chert, as above.	
	5	Black, carbonaceous shale, as above.	
2780-2790	90	Sandstone, as above.	
	5	Chert, as above.	
	5	Black, carbonaceous shale, as above.	
2790-2800	90	Sandstone, as above.	
	5	Chert, as above, slightly pyritic.	
2800-2810	90	Sandstone, as above.	
	5	Chert, as above.	
	5	Black, carbonaceous shale and black, dull, coal, pyritic.	
2810-2820	70	Sandstone, as above.	
	20	Black coal, dull, pyritic.	
	10	Chert, red-brown and light grey.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2820-2830	90	Sandstone, white, medium-coarse grain, moderate to well sorted, sub-angular to sub-rounded. Quartz is clear to white, smokey opaque, unconsolidated.	
	10	Black coal, as above.	
	trace	Chert, as above.	
2830-2840	80	Sandstone, as above	
	20	Black coal, as above.	
	trace	Chert, as above.	
2840-2850	80	Sandstone, as above.	
	15	Black coal, as above.	
	5	Chert, as above, dark grey and brown, trace pyrite.	
2850-2860	50	Sandstone, as above.	
	50	Black coal, as above, abundant pyrite.	
	trace	Siltstone, light grey.	
2860-2870	90	Sandstone, as above.	
	5	Black coal, as above.	
	5	Chert, as above, light grey.	
	trace	Pyrite.	
2870-2880	95	Sandstone, as above.	
	5	Chert, as above, light grey.	
	trace	Black coal, as above.	
2880-2890	85	Sandstone, as above.	
	10	Black coal, as above.	
	5	Chert, as above, light grey and red-brown.	
2890-2900	90	Sandstone, as above.	
	5	Black coal, as above.	
	5	Chert, as above, light grey and red-brown, trace pyrite.	
2900-2910	90	Sandstone, as above.	
	10	Chert, as above, light grey, red-brown and buff, trace pyrite.	
2910-2920	40	Sandstone, as above.	
	55	Coal, black, dull, pyritic.	
	5	Sandstone, buff brown-cream, fine grain, dolomitic.	
2920-2930	10	Coal, as above.	
	5	Sandstone, buff brown-cream, fine grain, dolomitic.	
	trace	Chert, as above, light grey and red-brown.	
	trace	Yellow, iron-stained quartz, trace pyrite.	
	85	Sandstone, as above.	
2930-2940	80	Sandstone, as above.	
	10	Silty claystone and clayey siltstone, dark grey, firm to hard, glauconitic, non-calcareous and shell fragments. (cave-in?)	
	5	Sandstone, buff brown-creamy, dolomitic, fine grain.	
	5	Chert, as above.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
2940-2950		'As for 2930-2940', trace pyrite, trace mineral fluorescence.	
2950-2960	85	Sandstone, as above.	
	15	Coal, as above.	
	trace	Sandstone, buff, brown-cream, dolomitic, fine grain.	
2960-2970	95	Sandstone, as above.	
	5	Chert, as above.	
	trace	Coal, Dolomitic, sandstone, as above.	
2970-2980	85	Sandstone, as above.	
	10	Silty claystone and clayey siltstone, as above.	
	5	Coal, as above.	
	trace	Pyrite, glauconite.	
2980-2990	95	Sandstone, as above.	
	5	Coal, as above.	
	trace	Pyrite, glauconite, siltstone, grey, chert light grey, as above.	
2990-3000	75	Sandstone, as above.	
	25	Coal, as above.	
	trace	Yellow-brown, iron-stained quartz.	
3000-3010	90	Sandstone, as above.	
	5	Coal, as above.	
	5	Chert or indurated siltstone, light grey, dark grey.	
	trace	Dolomitic sandstone, fine grain.	
3010-3020	85	Sandstone, white, medium-coarse grain, sub-angular to sub-rounded, moderately sorted, loosely consolidated, Quartz predominantly clear, minor white, smokey opaque.	
	10	Coal, dull, black, pyritic.	
	5	Siltstone, grey, hard, indurated.	
	trace	Dolomitic sandstone, fine grain.	
3020-3030	85	Sandstone, as above.	
	5	Coal, black, as above.	
	5	Siltstone, grey, as above.	
	5	Dolomitic sandstone, buff, fine grain.	
3030-3040	85	Sandstone, as above.	
	10	Siltstone, medium grey, hard to firm, as above.	
	5	Coal, as above.	
	trace	Dolomitic sandstone, buff, fine grain.	
304-3050	85	Sandstone, as above.	
	15	Siltstone, as above.	
	trace	Coal, as above and dolomitic sandstone, as above.	
3050-3060	70	Sandstone, cemented, white, fine grain, poor visible porosity.	Poor
	10	Siltstone, dark grey, firm to hard.	
	20	Sandstone, as above.	
	trace	Coal, as above and yellow-light brown, iron-stained, coarse grain, quartz.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3060-3070	20	Siltstone, dark grey, firm to hard.	
	10	Sandstone, cemented, as above.	
	5	Coal, as above.	
	65	Sandstone, loosely consolidated, as above.	
	trace	Pyrite and iron-stained, coarse grain, quartz.	
3070-3080	80	Sandstone, loosely consolidated, as above.	
	20	Siltstone, dark grey, firm to hard, slightly pyritic and micaceous.	
	trace	Pyrite and abundant iron-stained, coarse grain quartz, (cave-in from PPF).	
3080-3090	80	Sandstone, as above.	
	20	Siltstone, as above.	
	abundant	Coarse grain, iron-stained quartz, (cave-in from PPF).	
3090-3100	80	Sandstone, white, medium-coarse grain, sub-rounded, loosely consolidated, moderately sorted. Quartz predominantly clear, minor white smokey quartz.	
	10	Coal, as above.	
	10	Siltstone, as above and green.	
	trace	Red-brown, chert (PPF cave-in).	
3100-3110	80	Sandstone, as above.	
	10	Siltstone, as above.	
	10	Sandstone, cemented, white, fine grain, as above.	
	trace	Coal, as above.	
3110-3120	80	Sandstone, loosely consolidated, as above.	
	15	Coal, as above.	
	5	Sandstone, cemented, as above.	
	trace	Chert, light grey and light green.	
3120-3130	80	Sandstone, loosely consolidated, as above.	
	5	Cemented sandstone, as above.	
	10	Coal, as above.	
	5	Siltstone, dark grey, firm, as above.	
3130-3140	95	Sandstone, white, medium-coarse grain, sub-rounded, moderate to poorly sorted, loosely consolidated. Quartz predominantly clear, minor, white, smokey opaque.	
	5	Coal, as above.	
	trace	Cemented sandstone, as above.	
3140-3150	90	Sandstone, as above.	
	10	Coal, as above.	
3150-3160	95	Sandstone, as above.	
	5	Coal, as above.	
	trace	Coarse grain, pyrite.	
3160-3170	90	Sandstone, as above.	
	5	Coal, as above.	
	5	Siltstone, dark grey as above.	
	trace	Shell fragments.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3170-3180	90	Sandstone, as above.	
	5	Coal, as above.	
	5	Siltstone, dark grey, as above.	
	trace	Shell fragments, pyrite.	
3180-3190	90	Sandstone, as above.	
	5	Coal, as above.	
	5	Siltstone, medium brown, hard, dolomitic.	
3190-3200	100	Sandstone, as above.	
	trace	Coal, as above, siltstone, as above and siltstone dark grey, firm to hard.	
3200-3210	90	Sandstone, as above.	
	5	Coal, as above.	
	5	Siltstone, dark grey, firm to hard.	
3210-3220	85	Sandstone, as above.	
	10	Coal, as above.	
	5	Siltstone, as above.	
	trace	Coarse grain, pyrite.	
3220-3230	85	Sandstone, as above.	
	10	Siltstone, as above.	
	5	Cemented, white, fine grain, sandstone, as above.	Poor.
	trace	Coal as above.	
3230-3240	90	Sandstone, as above.	
	5	Siltstone, as above.	
	5	Cemented white fine grain, sandstone, as above.	
	trace	Coal, pyrite.	
3240-3250	90	Sandstone, as above.	
	10	Coal, as above.	
	trace	Cemented, white, fine grain, sandstone, as above.	
3250-3260	70	Coal, black.	
	10	Siltstone, as above.	
	20	Sandstone, as above.	
	trace	Cemented, white, fine grain sandstone, as above.	
3260-3270	90	Coal, black.	
	10	Sandstone, as above.	
	trace	Siltstone, as above.	
3270-3280	90	Coal, black.	
	10	Sandstone, as above.	
	trace	Siltstone, as above.	
3280-3290	80	Sandstone, medium-coarse grain, white, moderately sorted, sub-rounded to sub-angular, loosely consolidated.	
	20	Coal, black, pyrite, dull, as above.	
3290-3300	70	Sandstone, as above.	
	30	Coal, as above.	
	trace	Shell fragments.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3300-3310	30	Coal, as above.	
	70	Sandstone, as above.	
3310-3320	80	Sandstone, as above.	
	20	Coal, as above.	
3320-3330	80	Sandstone, as above.	
	20	Coal, as above.	
3330-3340	90	Sandstone, as above.	
	10	Coal, as above.	
	trace	Siltstone, light grey.	
3340-3350	90	Sandstone, as above.	
	10	Coal, as above.	
	trace	Siltstone, light grey, pyrite.	
3350-3360	80	Sandstone, white, fine grain, cemented	Poor
	10	Sandstone, loosely consolidated, as above.	
	5	Coal, as above.	
	5	Siltstone, dark brown.	
3360-3370	30	Sandstone, cemented, as above.	
	30	Coal, as above.	
	40	Sandstone, loosely consolidated, as above.	
3370-3380	30	Sandstone, cemented, fine grain, white, as above. pyrite.	
	20	Coal, as above.	
	50	Sandstone, loosely consolidated, as above.	
	trace	Pyrite, yellow mineral fluorescence on iron-stained quartz.	
3380-3390	70	Sandstone, loosely consolidated, as above.	
	20	Coal, as above.	
	10	Sandstone, cemented, fine grain, as above.	
3390-3400		'As for 3380-3390'.	
3400-3410	80	Sandstone, loosely consolidated, as above.	
	20	Coal, as above.	
	trace	Shell fragments.	
3410-3420	60	Coal, as above.	
	40	Sandstone, loosely consolidated, as above.	
	trace	Brown stained quartz c yellow mineral fluorescence, no cut.	
3420-3430	80	Sandstone, loosely consolidated, as above.	
	20	Coal, as above.	
	trace	Pyrite, light grey siltstone.	
3430-3440	90	Sandstone, loosely consolidated, as above.	
	5	Coal, as above.	
	5	Siltstone, light grey, green, hard.	
3440-3450	30	Cemented, fine grain. sandstone, as above	Poor
	10	Coal, as above.	
	60	Sandstone, loosely consolidated, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3450-3460	80	Sandstone, loosely consolidated, as above.	
	10	Sandstone, cemented, fine grain, as above. 10% coal as above.	
3460-3470	90	Loose sandstone.	
	10	Cemented sandstone.	
	trace	Shaley coal.	
3470-3480	60	Loose sandstone, as above.	
	30	Cemented sandstone, as above.	
	10	Carbonaceous shale.	
3480-3490	90	Loose sandstone, as above.	
	5	Cemented sandstone, as above.	
	5	Carbonaceous shale.	
3490-3500	80	Loose sandstone, as above.	
	10	Cemented sandstone, as above.	
	10	Carbonaceous shale, (silty)	
	trace	Shell fragments.	
3500-3510	90	Loose sandstone, as above.	
	10	Cemented sandstone, as above.	
	trace	Carbonaceous shale - siltstone, glauconite, pyrite and shell fragments.	
3510-3520	80	Cemented sandstone, as above.	
	20	Loose sandstone, as above, trace carbonaceous shale or black coal.	
3520-3530	40	Cemented sandstone, as above.	
	50	Loose sandstone, as above.	
	10	Black coal, as above.	
3530-3540	100	Cemented sandstone, as above, fine grain.	
	trace	Black coal. as above.	
3540-3550		'As for 3530-3540'.	
3550-3560	80	Cemented sandstone.	
	10	Loose sandstone.	
	10	Black coal, as above.	
3560-3570	70	Cemented sandstone, as above.	
	25	Loose sandstone, as above.	
	5	Black coal, as above, trace dark grey claystone, soft-firm.	
3570-3580	60	Loose sandstone, as above.	
	30	Black coal.	
	10	Cemented sandstone, trace iron-stained quartz showing yellow mineral fluorescence.	
3580-3590	60	Loose sandstone, as above.	
	20	Cemented sandstone, as above.	
	20	Black coal, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3590-3600	40	Cemented sandstone, as above.	
	50	Loose sandstone, as above.	
	10	Black coal, as above.	
3600-3610	75	Loose sandstone, as above.	
	15	Cemented sandstone, as above.	
	10	Black coal, as above.	
	trace	Shell fragments and iron-stained quartz.	
3610-3620	50	Loose sandstone, as above.	
	30	Cemented sandstone, as above.	
	10	Shell fragments.	
	10	Claystone, buff-light brown.	
3620-3630	40	Shells and shell fragments.	
	25	Cemented sandstone, as above.	
	10	Siltstone and claystone, buff-brown.	
	25	Loose sandstone, as above.	
3630-3640	15	Shells and shell fragments, as above.	
	20	Cemented sandstone, as above.	
	45	Loose sandstone, as above.	
	10	Siltstone, dark green.	
	10	Siltstone, buff-brown.	
3640-3650	80	Sandstone, loose, as above.	
	10	Sandstone, cemented, as above.	
	10	Coal, black, as above.	
	trace	Shell fragments, siltstone, buff-brown.	
3650-3660	90	Sandstone, loose, as above.	
	5	Coal, black, as above.	
	5	Claystone, silty, medium grey, soft.	
3660-3670	100	Sandstone, loose, as above.	
3670-3680	30	Sandstone, cemented, as above.	
	5	Claystone, silty, medium grey, soft.	
	65	Sandstone, loose, as above, pyrite cement.	
	trace	Black coal.	
3680-3690	70	Sandstone, loose, as above.	
	10	Claystone, silty, medium grey and brown, soft, as above.	
	10	Sandstone, cemented, as above.	
	10	Black coal, as above.	
3690-3700		'As for 3680-3690' c trace shell fragments.	
3700-3710	85	Sandstone, loose, as above.	
	5	Claystone, as above.	
	5	Sandstone, cemented, as above.	
	5	Black coal, as above.	
3710-3720	20	Claystone, as above.	
	10	Sandstone, cemented, as above.	
	10	Black coal, as above.	
	60	Sandstone, loose, as above.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3720-3730	80	Sandstone, loose, as above	
	10	Claystone, silty, soft, green, brown and grey.	
	10	Sandstone, cemented, as above.	
	trace	Black coal, glauconite.	
3730-3740	75	Siltstone, loose, as above.	
	10	Claystone, silty, dark grey-green, firm to hard.	
	10	Black coal.	
	trace	Glauconite.	
3740-3750	5	Sandstone cemented.	
	30	Claystone, silty, dark grey and brown. Firm to hard.	
	trace	Shells and shell fragments, turreted gastropods.	
	20	Coal, black. (cave-ins)	
3750-3760	50	Sandstone, loose, as above.	
	30	Claystone, as above.	
	30	Cemented sandstone, as above.	
	20	Coal, black. (cave-ins).	
3760-3770	20	Sandstone, loose, as above.	
	40	Claystone, as above.	
	20	Cemented, sandstone, as above.	
	30	Coal, black (cave-ins).	
3770-3780	10	Sandstone, loose, as above.	
	90	Claystone, as above.	
	10	Sandstone, cemented, fine grain, buff-white, as above.	
	trace	Sandstone, loose, as above, black coal and shell fragments.	
3780-3790	80	Claystone, as above.	
	15	Sandstone, cemented, fine grain, white, as above.	
	5	Glauconite and shell fragments.	
	trace	Coal, black.	
3790-3800	90	Sandstone, white, medium-coarse grain, moderate to well sorted, sub-rounded.	
	10	Claystone, as above.	
	trace	Coal, black and cemented sandstone, as above.	
3800-3810	80	Sandstone, loose, as above.	
	10	Coal, black, as above.	
	5	Cemented, fine grain, sandstone, as above.	
	5	Claystone, as above.	
3810-3820	25	Sandstone, loose, as above.	
	5	Coal, as above.	
	5	Cemented, fine grain, sandstone, as above.	
	5	Claystone, as above.	
3820-3830	20	Cemented, fine grain, sandstone, as above	
	10	Claystone, as above.	
	10	Coal, as above.	
	60	Sandstone, loose, as above.	
3830-3840	10	Cemented, fine grain, sandstone, as above.	
	10	Claystone, as above.	
	10	Coal, as above.	
	70	Sandstone, loose, as above.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3840-3850	90	Sandstone, loose, as above.	
	10	Siltstone, buff, hard, dolomitic.	
	trace	Claystone, silty, dark grey.	
	trace	Cemented, fine grain, sandstone, white-light grey c̄ finely diss. carbonaceous material.	
3850-3860	80	Cemented, sandstone, as above.	
	10	Sandstone, loose, as above.	
	10	Claystone, silty, dark grey.	
	trace	Shell fragments, coal, black.	
3860-3870	40	Cemented sandstone, as above.	
	30	Sandstone, loose, as above.	
	10	Siltstone, buff, hard, dolomitic, as above.	
	10	Claystone, siltstone, dark grey.	
	10	Coal, black, (cave-in).	
3870-3880	60	Cemented sandstone, as above.	
	20	Siltstone, buff, as above.	
	20	Sandstone loose, as above.	
	trace	Claystone, as above.	
3880-3890	30	Siltstone, buff, dolomitic, as above.	
	30	Sandstone, white, light grey, cemented, as above.	
	10	Claystone, silty, medium grey, as above.	
	30	Sandstone, loose, as above.	
3890-3900	30	Siltstone, buff, as above.	
	10	Claystone, as above.	
	60	Sandstone, loose, as above.	
	trace	Pyrite, shell fragments.	
3900-3910	10	Siltstone, buff, dolomitic, as above.	
	10	Claystone, as above.	
	70	Sandstone, loose, as above.	
	10	Cemented, sandstone, as above.	
trace	Glauconite and iron-stained quartz.		
3910-3920	70	Siltstone, clayey, light grey and light green, glauconitic, diss. carbonaceous material, soft.	
	5	Siltstone, dolomitic, as above.	
	25	Sandstone, loose, as above.	
	trace	Cemented sandstone, as above, black coal as above, iron- stained quartz, glauconite.	
3920-3930	80	Sandstone, loosely consolidated, medium-coarse grain, white, poorly sorted sub-rounded.	
	20	Siltstone, sandy (fine grain sandstone) buff, dolomitic, hard.	
	trace	Shell fragments.	
3930-3940	50	Siltstone, clayey, light grey and light green, glauconitic c̄ diss. carbonaceous material, soft.	
	30	Siltstone, sandy, buff, dolomitic, hard.	
	20	Sandstone, loose, as above.	
3940-3950	40	Siltstone, clayey, light grey, soft, sandy.	
	30	Siltstone, sandy, buff, dolomitic hard. 1	
	30	Sandstone, loose, as above. 2	
	trace	Note: 1 can be matrix to 2. see adhering to quartz grains. Glauconite and iron-stained quartz.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
3950-3960	40	Siltstone, clayey, soft, as above.	
	40	Siltstone, sandy, buff, hard as above, dolomitic.	
	20	Sandstone, loose, as above. very coarse grain, yellow-brown iron-stained.	
	trace	Glauconite, shell fragments (coral fragments dominant).	
3960-3970	90	Siltstone, clayey soft, as above.	
	10	Sandstone, loose, as above.	
	trace	Siltstone, sandy, buff.	
3970-3980	70	Siltstone, clayey soft, as above.	
	20	Siltstone, sandy, buff, as above.	
	10	Sandstone, loose, as above.	
3980-3990	40	Siltstone, clayey, soft, light grey and light brown-buff. Some firm-hard.	
	60	Sandstone, loose, as above.	
3990-4000	70	Siltstone, clayey soft, light grey.	
	10	Siltstone, buff, hard, dolomitic.	
	20	Sandstone, loose, medium-coarse grain (minor very coarse grain).	
	trace	Glauconite and iron-stained quartz, yellow-light brown.	
4000-4010	70	Siltstone, clayey, soft, light grey and buff.	
	30	Sandstone, loose, as above.	
	trace	Thick walled lamellibranch.	
4010-4012	80	Poorly sorted, loose, medium-very coarse grain, sandstone.	
	20	Siltstone, light grey, as above, firm to soft.	
4012-4020	80	'As for 4010-4012'.	
	20	Note: glauconite and thick walled lamellibranch. Nullawarre greensand?	
4020-4030	100	Siltstone, clayey, medium grey, slight micaceous and slight glauconitic and slight carbonaceous. Belfast type lithology.	
4030-4040	90	Siltstone, as for 4020-4030	
	5	Sandstone, loose, as above.	
	5	Sandy siltstone, dolomitic, buff, hard.	
4040-4050	50	Siltstone, as for 4020-4030 and buff soft siltstone.	
	50	Sandstone, loose, as for 4010-4012.	
	trace	Glauconite, Pyrite, shell fragments abundant.	
4050-4060	90	Siltstone, as above.	
	10	Sandstone, loose, as above.	
	abundant	Glauconite and shell fragments.	
4060-4070		'As for 4050-4060'.	
	trace	Note: abundant iron-stained quartz. Pyrite, shell fragments, glauconite.	
4070-4080		'As for 4040-4060'.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4080-4092	100	Siltstone, as above	
4092-4100	100	Sandstone, light green, medium grain, well sorted, sub-rounded, excellent visible porosity, glauconitic. (up to 10-15%) trace yellow mineral fluorescence (siderite) loosely consolidated, shell fragments minor.	
4100-4110		'As above'.	
4110-4119		'As above'.	
4119-4130	100	Sandstone, as above. Glauconite up to 10-15%.	
4130-4140	100	Sandstone, as above, minor very coarse grain and coarse grain quartz grains, sorting only moderate, glauconite 10-15%.	
4140-4150	100	Sandstone, dark green, partly cemented, medium-coarse grain, poorly sorted, sub-rounded, glauconite well rounded. Quartz grains & green glauconite cement, trace pyrite.	
4150-4160	100	Sandstone, as above.	
4160-4170	100	Sandstone, as above.	
4170-4180	100	Sandstone, as above.	
4180-4190	100	Sandstone, as above, 30% glauconite, trace pyrite.	
4190-4200	100	Sandstone, as above, 20% glauconite (sandstone, cleaning up)	
4200-4210	100	Sandstone, light green, loosely consolidated, glauconite 10%, green minerals attached to fractures in quartz, sub-rounded to sub-angular, moderately sorted.	
4210-4220	trace 100	Cemented dark green and medium green sandstone. Sandstone, light green, medium grain, well sorted, sub-rounded, quartzose, glauconite ≈ 10%, loosely consolidated. Quartz slightly iron-stained.	
	trace	Cemented dark green sandstone.	
4220-4230	100	Sandstone, as above, trace, cemented dark green sandstone.	9gu
4230-4240	100	Sandstone, as above, medium-coarse grain, moderately sorted. Trace cemented dark green sandstone.	
4240-4250	80 10 10	Sandstone, as above. Dark green cemented sandstone, as above. Siltstone, light grey, soft, carbonaceous, micaceous.	9gu
4250-4260	100	Sandstone, light green, loosely consolidated, light green-white, carbonaceous and quartz grains, medium grain, well sorted, sub-rounded. Glauconite 10%, friable, good to excellent porosity.	9gu

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4260-4270	100	Sandstone, as above.	13gu
4270-4280	100	Sandstone, as above, medium-coarse grain, moderately sorted, glauconite \approx 5% or less.	17gu
	trace	Siltstone, light grey, soft, carbonaceous, micaceous.	
	trace	Cemented dark green, sandstone.	
4280-4290		'As for 4270-4280'	
4290-4300	100	Sandstone, light green, loosely consolidated, medium grain, well sorted, sub-rounded. Glauconite \approx 5% or less.	
	trace	Siltstone, light grey.	
4300-4310	100	Sandstone, as above.	
	trace	Glauconite, siltstone, as above.	
4310-4320	100	Sandstone, as above.	
	trace	Glauconite, siltstone as above, and cemented dark green sandstone.	
4320-4330	100	Sandstone, as above.	
	trace	Glauconite, siltstone, as above, cemented dark green sandstone, as above.	
	trace	Thick shelled lamellibranch, turreted gastropod.	
4330-4340	100	Sandstone, as above.	
	trace	Shell fragments.	
	trace	Siltstone, glauconite, cemented dark green sandstone, as above.	
4340-4350	100	Sandstone, as above.	
	trace	Siltstone, medium grey, carbonaceous, micaceous, soft, as above.	
4350-4360	100	Sandstone, as above.	
	trace	Glauconite, siltstone, as above, cemented dark green sandstone, as above.	
4360-4373	100	Sandstone, as above.	
	trace	Glauconite, siltstone, as above, cemented dark green, sandstone, as above.	
4373-4380	20	Siltstone, clayey medium grey, carbonaceous, slightly micaceous, soft.	
	80	Sandstone, medium-very coarse grain, poorly sorted, loosely consolidated \bar{c} glauconite plus minor cemented dark green sandstone, as above. (Most likely cave-ins - refer drill break).	
4380-4390	70	Sandstone, loosely consolidated, medium grain, well sorted, as above \bar{c} glauconite plus minor cemented dark green sandstone, as above. (Most likely cave-ins or recirculated cuttings of mud).	2½gu
	30	Siltstone, as above.	
4390-4400	80	Sandstone, as above. (Most likely cave-ins).	2½gu
	20	Siltstone, as above.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4400-4410	10	Siltstone, as above.	2½gu
	80	Sandstone, loosely consolidated, medium-coarse grain, poorly sorted, yellow stained quartz as well as clear. Glauconite, abundant. (Most likely cave-ins.)	
	trace	Shell fragments.	
	10	Buff dolomitic, slight glauconitic siltstone.	
4410-4420		'As for 4400-4410'.	2½gu
4420-4430		'As for 4400-4410'. Trace cemented dark green, sandstone, as above.	2½gu
4430-4440		'As for 4400-4410'.	2½gu
4440-4450	50	Siltstone, as above.	2½gu
	50	Sandstone, as above. (Cave-in material).	
4450-4460	20	Siltstone, as above.	2½gu
	80	Sandstone, as above. (Cave-in material).	
4460-4470	20	Siltstone, as above.	2½gu
	10	Buff, dolomitic, slightly glauconitic, siltstone.	
	trace	Dark green, glauconitic, cemented sandstone (Cave-in material).	
	70	Sandstone, as above, trace shell fragments.	
4470-4480	70	Siltstone, as above.	2½gu
	30	Sandstone, as above. (Cave-in material).	
4480-4490	30	Siltstone, as above and a buff-light brown, soft Siltstone	2½gu
	70	Sandstone, as above.	
	trace	Buff, dolomitic, siltstone, as above.	
4490-4500		'As for 4480-4490'.	2½gu
4500-4510		'As for 4480-4490'.	2½gu
	abundant	Pyrite.	
	trace	to trace plus. Shell fragments, coralline fragments.	
4510-4520		'As for 4480-4490'.	2½gu
4520-4530		'As for 4480-4490'.	
4530-4540	100	Siltstone, clayey, dark grey, richly glauconitic. slight carbonaceous, slight micaceous, soft.	6gu
	trace	Shell fragments, quartz, trace buff dolomite or dolomitic siltstone.	
4540-4550	100	Siltstone, as above.	6gu
	trace	Shell fragments, quartz.	
4550-4560	100	Siltstone, as above.	6gu
	trace	Shell fragments, quartz.	
4560-4570	100	Siltstone, as above.	6gu
	trace	Shell fragments, quartz.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4570-4580	100 abundant trace	Siltstone, as above. Shell fragments, foraminifera and coral fragments. Quartz.	6gu
4580-4590	100 abundant trace	Siltstone, as above. Shell fragments. (principally coral fragments) Dolomite	6gu
4590-4600	100 abundant	Siltstone, as above. Shell fragments, as above.	
4600-4610		'As above for 4590-4600'.	10gu
4610-4620		'As above for 4590-4600'. (Quartz grain contamination).	10gu
4620-4630		'As above for 4590-4600'.	10gu
4630-4640		'As above for 4590-4600'.	10gu
4640-4650		'As above for 4590-4600'.	10gu
4650-4660		'As above for 4590-4600'.	10gu
4660-4670		'As above for 4590-4600'. Trace dolomite. Minor slickensided grains.	10gu
4670-4680	90 10	Siltstone, as above. Buff limestone, crystalline, slight glauconitic up to 10% quartz grain contamination. Minor slickensides.	10gu
4680-4690	100	Siltstone, as above, but more clayey, up to 60% Claystone, as above. Minor slickensides.	10gu
4690-4700	100	As above for 4680-4690'.	10gu
4700-4710	90 10 abundant abundant	Siltstone, as above. Limestone, white, crystalline. Slickensided limestone, dark grey slickensided surface, under surface white. The limestone fluoresces yellow. Shell fragments.	10gu
4710-4720		'As for 4700-4710'.	10gu
4720-4730	20 trace trace trace	Coal, black, vitreous. Limestone, as above, (yellow calcite fluorescence) Flounder slickensided calcite Quartz, medium-coarse grain, abundant shell fragments.	10gu
4732-4734		Coal, black, vitreous and black carbonaceous shale, brittle.	32gu
4734-4740	50 10 trace 40 trace	Siltstone, as above. Limestone and slickensided calcite, as above. Coal. Sands, white, green, glauconitic, loosely consolidated. Shell fragments.	

INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4740-4753	80	Siltstone, grey, as above.	
	20	Sandstone, white, minor yellow-brown, medium-coarse grain, loosely consolidated, poorly sorted.	
	trace	Sandstone, fine-medium grain, cemented.	
	trace	Limestone and dolomite, crystalline, buff.	
4753-4760	90	Sandstone, white and clear translucent, medium-coarse grain, poorly sorted, sub-rounded to sub-angular, loosely consolidated, excellent porosity.	67gu
	10	Siltstone, as above, probably cave-ins.	
	trace	Coal, black, vitreous, limestone, as above, pyrite.	
4760-4770	90	Sandstone, as above.	61gu
	5	Siltstone, as above probably cave-ins.	
	5	Coal, as above, probably cave-ins.	
4770-4780	95	Sandstone, as above.	
	5	Siltstone.	
	trace	Dolomite.	
4780-4790	90	Sandstone, as above.	
	10	Siltstone, as above.	
	trace	Dark green cemented, sandstone, strongly glauconitic. (Cave-ins)	
4790-4800	95	Sandstone, as above.	
	5	Siltstone.	
	trace	Medium-coarse grain glauconite.	
4800-4810	100	Sandstone, white and clear, translucent, medium-coarse grain, moderately sorted, sub-rounded to sub-angular, loosely consolidated, excellent porosity.	
	trace	Siltstone.	
	trace	Coal, black.	
4810-4820	85	Sandstone, as above.	
	10	Siltstone.	
	5	Sandstone, white fine grain, cemented, minor carbonaceous matrix and glauconite.	
	trace	Coal, black, Flounder slickensided calcite, dolomite, dark green, cemented sandstone, as above.	
4820-4830	80	Siltstone, as above.	
	10	Sandstone, fine grain, cemented, white, as above.	
	5	Sandstone, as above.	
	5	Dolomite.	
4830-4840	90	Sandstone, white, fine grain, cemented kaolin matrix slightly calcareous, trace glauconite and carbonaceous material fine grain angular quartz grains, brittle to hard.	
	10	Claystone, dark brown-grey and siltstone, as above.	
4840-4850	80	Sandstone, fine grain, white, as above.	
	10	Siltstone, as above.	
	10	Sandstone, white, medium-coarse grain, loosely consolidated, as above.	
	abundant	Shells and shell fragments. (Turreted gastropods)	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4850-4855	60	Siltstone, as above, soft.	
	40	Sandstone, loose, as above.	
	trace	Shells and shell fragments.	
4855-4860	60	Sandstone, loose. (cave-in).	
	20	Siltstone, as above.	
	10	Sandstone, cemented, as above.	
	10	Coal, black, vitreous and carbonaceous shale.	
4860-4870	80	Coal, black, vitreous, conchoidal fracture and carbonaceous shale, black, fissile, coaly, \bar{c} abundant, pyrite.	
	10	Sandstone, white-light grey, fine grain, cemented, calcareous cement, trace chlorite, trace carbonaceous matter, trace lithic fragments. Quartz grains light grey, cement white.	
4870-4880		'Badly contaminated sample'. Cave-ins, dark green glauconite, cemented sandstone, shell fragments.	
	100	Siltstone, as above dominant.	
4880-4890	80	Siltstone, as above.	
	10	Loose Quartz sand, medium-coarse grain.	
	10	Sandstone, cemented, as above.	
4890-4900	90	Sandstone, white to clear, loosely consolidated, medium-coarse grain, sub-angular, poorly sorted.	
	5	Siltstone, as above.	
	5	Coal, (cave-in).	
4900-4910	40	Cemented sandstone, as above.	
	30	Siltstone, as above.	
	30	Sandstone, loose, as above, medium-coarse grain.	
	trace	Coal, shell fragments buff dolomitic siltstone.	
4910-4920	90	Siltstone, as above.	
	10	Cemented sandstone, as above.	
	abundant	Shell fragments.	
	trace	Loose quartz	
4920-4930		Total sample has a light green-grey aspect.	
	50	Siltstone, as above. (still glauconitic).	
	50	Cemented sandstone, as above, but light green, more lithics?	
4930-4940	50	Siltstone, as above. (Total sample has a light green-grey aspect).	
	50	Cemented sandstone, as above.	
	trace	Shell fragments and red-brown lithics. Minor yellow, mineral fluorescence associated with yellow quartz.	
4940-4950	80	Cemented sandstone, fine grain, as above \bar{c} . trace of red-brown lithic grains cemented into the sandstone.	
	20	Siltstone, as above.	
	trace	Shell fragments.	
4950-4960	50	Cemented sandstone, white, light grey-light green, fine grain, lithic content up to 30% in this sandstone.	
	50	Siltstone, as above. Introduction of chloritic mineral and note introduction of bronze coloured mica.	

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INTERVAL	%	LITHOLOGICAL DESCRIPTION	GAS
4960-4970	50	Cemented sandstone, as above - more lithics, red-brown rock fragments.	
	50	Siltstone, as above.	
	trace	Chlorite, as above, trace yellow mineral fluorescence.	
4970-4980	95	Siltstone, medium grey, soft, chloritic and or glauconitic. \bar{c} coarse grain bronze coloured mica-biotite.	
4980-4990	70	Siltstone, as above	
	30	Sandstone, as above.	
4990-5000	90	Siltstone, as above.	
	10	Sandstone, medium-coarse grain, white to clear, loosely consolidated.	
	trace	Cemented sandstone, as above.	
5000-5010	90	Siltstone, as above.	
	10	Cemented sandstone, as above but dark green and dark grey-brown.	
5010-5020	20	Siltstone, as above.	
	80	Green and dark grey, lithic, sandstone \bar{c} biotite, sub-angular.	
5020-5030	90	Sandstone, green, grey and brown, lithic, medium-coarse grain, sub-angular, poorly sorted, biotite mica.	
	10	Siltstone, as above.	
5030-5040	90	Sandstone, as above.	
	10	Siltstone, as above.	
5040-5050	85	Sandstone, as above	
	15	Siltstone, as above.	
5050-5060	90	Sandstone, as above.	
	10	Siltstone, as above.	
5060-5068	70	Siltstone, as above.	
	30	Sandstone, as above, trace pyrite.	
5068		TOTAL DEPTH	

SUMMARY

Velocity Data Pty. Ltd. conducted a velocity survey for Beach Petroleum No Liability in the North Paaratte No. 1 well, PEP 93, Victoria. The date of the survey was November 22, 1979.

Twenty-one shots were taken over seventeen levels in the well. Record quality was fair and the results are considered to be reliable. Two short surface spreads were shot to obtain near surface velocity information.

Explosives were used as an energy source with charges varying between one quarter and one stick of explosive.

The survey was used to calibrate sonic logs. A calculated depth function of $Z = 8974t^{1.224}$ is a close fit to the time-depth curve except at the very shallow levels.

The well was surveyed to a depth of 5010 feet below kelly bushing.

GENERAL

Velocity Data Pty. Ltd. of Brisbane, Australia, conducted a velocity survey for Beach Petroleum No Liability on November 22, 1979.

One man and the equipment travelled from Brisbane by air. A second man was mobilised locally.

Name of Well : North Paaratte No. 1
Location : PEP 93, Victoria
Co-ordinates : Lat. 38°33'10"S. Long. 142°57'15"E.
Date of Survey : November 22, 1979
Elevation of K.B. : 315 ft. ASL
Logging : Go. International
Weather : Fine
Sonic Log Interval: 1360 ft. to 5038 ft. below K.B.
Depth Surveyed : 5010 ft. below K.B.
Operator : W.J. Larsen

COMPUTING

Sonic times are adjusted to check-shot times using two methods.

- 1) A linear correction

$$\frac{(t_{L_2} - t_{R_2}) - (t_{L_1} - t_{R_1})}{Z_2 - Z_1} = \text{correction in } \mu\text{secs/ft.}$$

- 11) A differential correction

$$100 \left(1 - \frac{(t_{R_2} - t_{R_1})}{(t_{L_2} - t_{L_1})} \right) = \% \text{ decrease in interval time}$$

where t_L = sonic log time

t_R = record time

and $Z_2 - Z_1$ = depth interval

Where check-shot interval times are longer than corresponding sonic interval times, errors are assumed to be instrumental and are adjusted using the linear correction. However, if formation characteristics, such as high porosity or the presence of gas are suspected, the differential correction is used.

The differential correction is also applied where check-shot interval times are shorter than corresponding sonic times and these differences are assumed to arise from caving or mud cake effects.

Four shots were taken near datum from varying offset distances. One was N.R. but the remaining three were in close agreement and when averaged, gave an average velocity of 6354 ft./sec. This velocity agrees with those obtained from the surface refraction spread (refer Figure 4), and has been used to obtain an extrapolated time of .047⁵ secs. as the correction time from shot to datum. No other corrections have been applied when relating the two-way times to the record section (refer Figure 3).

Single shots were taken at other levels with a repeat shot at 5010 ft. because of a poor quality record.

Shot 14 at the 4734 ft. level has not been used

in calculations. The quality of the break is poor.

Discrepancies between shot interval times and corresponding sonic interval times are small with the shot interval times tending to be the longer. There are differences of .003 secs. over the 2195 to 2632 interval and the 4095 to 4360 interval; elsewhere the differences are very small.

A calculated depth function of $Z = 8974t^{1.224}$ fits the time-depth curve closely except for those points shallower than 750 ft.

Time-depth and velocity curves are submitted with this report along with copies of the field records.



L.W. Pfitzner

APPENDIX - 3

VELOCITY SURVEY

BY

VELOCITY DATA PTY. LTD.

WELL VELOCITY SURVEY

NORTH PAARATTE NO. 1

PEP 93

Victoria

for

BEACH PETROLEUM NL

by

VELOCITY DATA PTY. LTD.

Brisbane, Australia

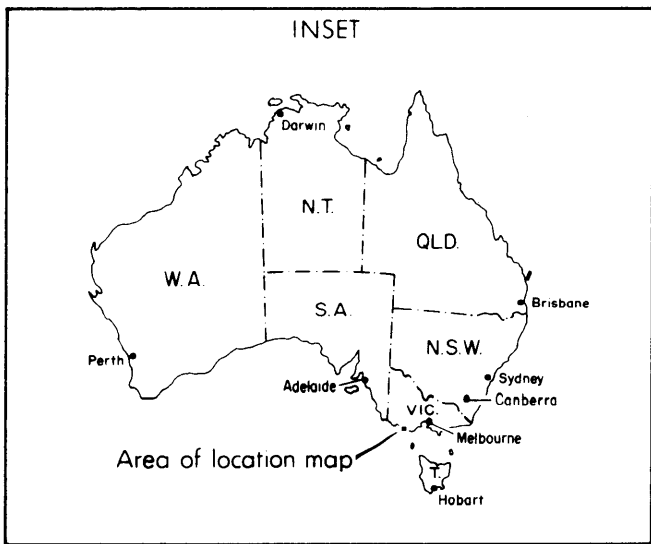
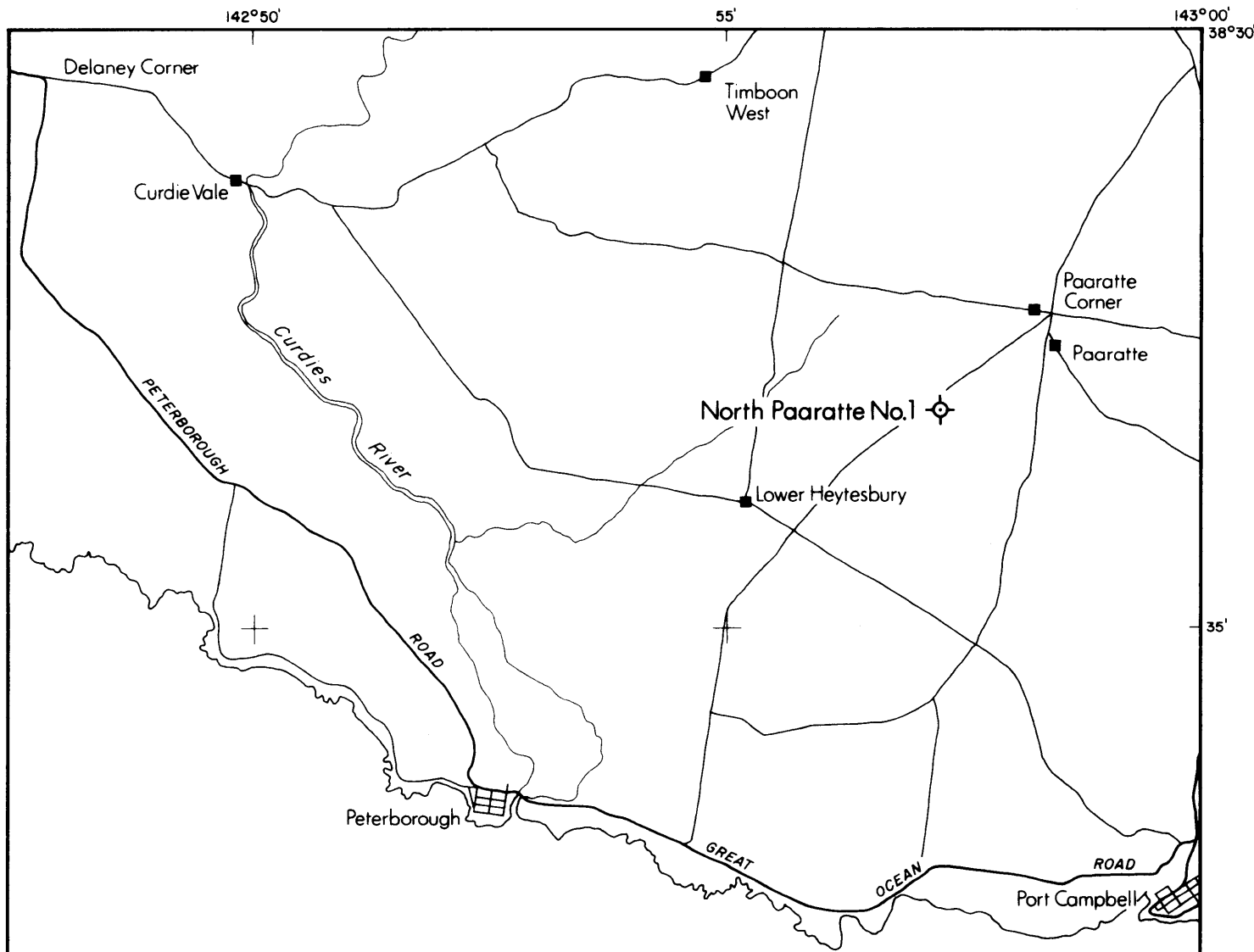
November 22, 1979

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COMPUTATIONS	3
COMPUTATION SHEET	

Figures:

Figure 1	Location Map
Figure 2	Shot location sketch
Figure 3	Time-depth points and Time-depth functions
Figure 4	Surface Refraction Spread
Figure 5	Time-depth, average velocity and interval velocity curves
	Sample Records



INDIAN
+
OCEAN

BEACH PETROLEUM N.L.
NORTH PAARATTE No.1
WELL LOCATION MAP

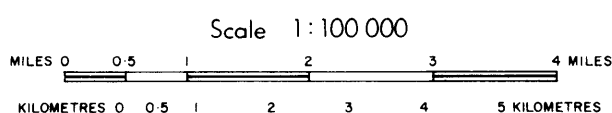
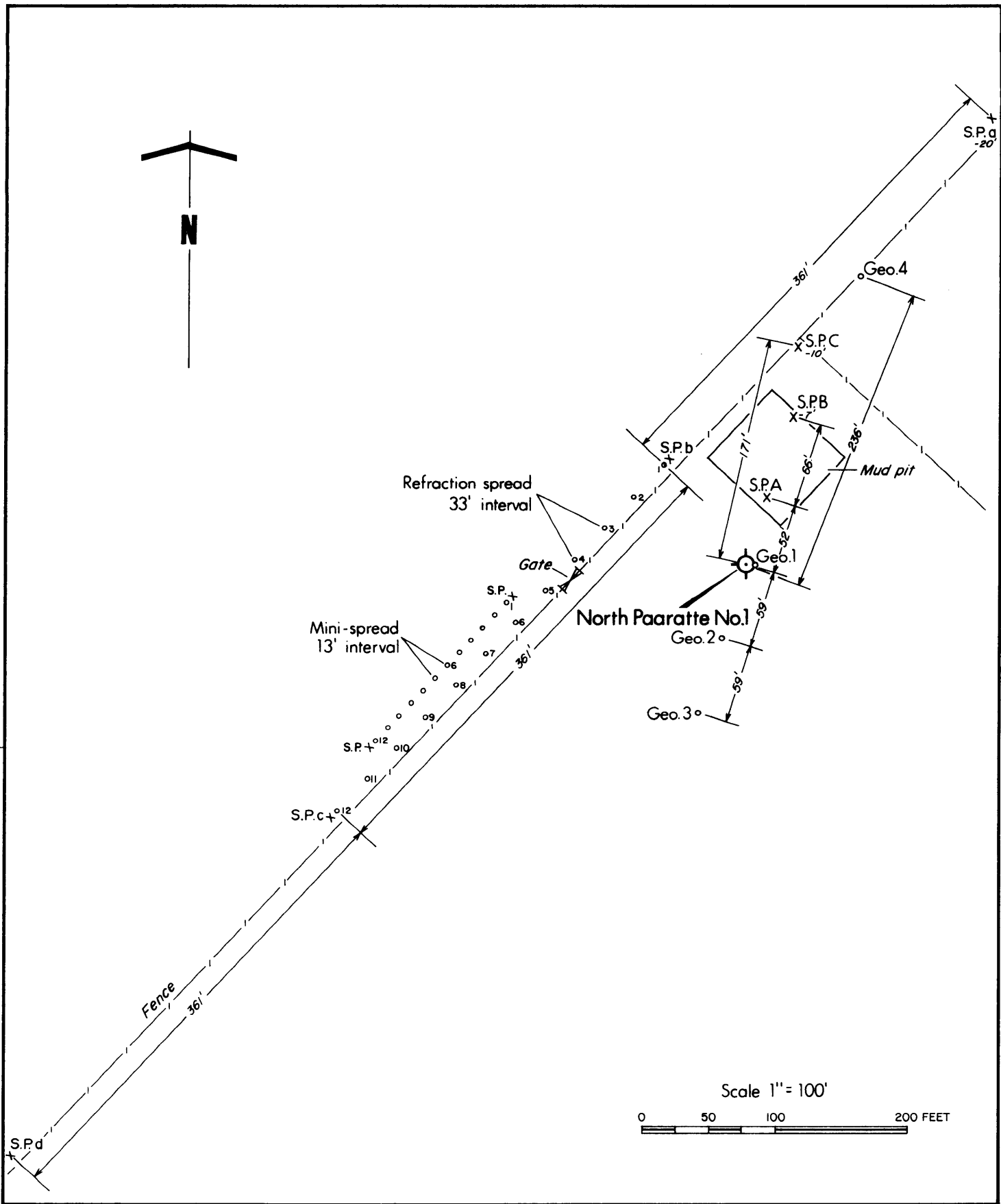


FIGURE 1



BEACH PETROLEUM N.L.
NORTH PAARATTE No.1
 SHOT POINT LOCATION SKETCH

APPENDIX - 4

CHEMICAL ANALYSIS OF WATERS

RECOVERED FROM FORMATION INTERVAL TESTS

Telephone 651 9111
Ext. 1304
RM:MH
An.SL,CRM, 18/12
DR.17.12.79

DEPARTMENT
OF
MINERALS AND ENERGY

CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

21 December 1979

Report on Sample No. 3671/79
U.W.R.S. 21044

Sample: Bore Water
Locality: Parish Paaratte
Sender: D.Harrison
Beach Petroleum NL
360 Collins St., MELBOURNE Vic. 3000

Particulars:

Bore	-
Plant	-
Sample	-
Date	-
Depth (metres)	4902ft
Aquifer level (metres)	-
Static level (metres)	-
Drawdown (metres)	-
Aquifer type	-
Yield (litres/sec)	-
Test type	-
Bore cased to (metres)	-
Position	-
Owner	-
Address	-
Remarks	F I T No.1
Label No.	-

Results:

		mg/litre
Total solids in solution	by Summation	18336
Chloride	(Cl)	10700
Carbonate	(CO ₃)	Nil
Bicarbonate	(HCO ₃)	311
Sulphate	(SO ₄)	120
Nitrate	(NO ₃)	14
Calcium	(Ca)	1035
Magnesium	(Mg)	84
Sodium	(Na)	5981
Potassium	(K)	91
Iron-Total	(Fe)	n.d.
Iron-Soluble	(Fe)	0.3
Silicate	(SiO ₂)	n.d.
Total hardness (as CaCO ₃)		2930
pH		7.61
Electrical Conductivity at 25°C.		29,300 micromhos/cm


CHIEF CHEMIST

Telephone 6519111
Ext. 1304
RM:MH
An. SL, CRM, 18/12
DR. 17/12/79

DEPARTMENT
OF
MINERALS AND ENERGY

CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

21 December 1979

Report on Sample No. 3672/79
U.W.R.S. 21045

Sample: Bore Water

Locality: Parish Paaratte

Sender: D. Harrison

Beach Petroleum NL

360 Collins St., MELBOURNE Vic. 3000

Particulars:

Bore	-
Plant	-
Sample	-
Date	-
Depth (metres)	-
Aquifer level (metres)	-
Static level (metres)	-
Drawdown (metres)	-
Aquifer type	-
Yield (litres/sec)	-
Test type	-
Bore cased to (metres)	-
Position	-
Owner	-
Address	-
Remarks	F I T No.2
Label No.	-

Results:

mg/litre

Total solids
in solution

Chloride	(Cl)
Carbonate	(CO ₃)
Bicarbonate	(HCO ₃)
Sulphate	(SO ₄)
Nitrate	(NO ₃)
Calcium	(Ca)
Magnesium	(Mg)
Sodium	(Na)
Potassium	(K)
Iron-Total	(Fe)
Iron-Soluble	(Fe)
Silicate	(SiO ₂)

No Sample Could Be Obtained (suitable for testing)

Total hardness (as CaCO₃)

pH

Electrical Conductivity at 25°C.

micromhos/cm

S. Mathew
CHIEF CHEMIST

Telephone 651 9111
Ext. 1304
RM:MH
An.SL,CRM, 18/12
DR.17.12.79

DEPARTMENT
OF
MINERALS AND ENERGY

CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

21 December 1979

Report on Sample No. 3673/79.....
U.W.R.S. 21046.....

Sample: Bore Water

Locality : Parish Paaratte

Sender: D Harrison.....

Beach Petroleum NL.....

360 Collins St., MELBOURNE Vic, 3000

Particulars:

Bore	-
Plant	-
Sample	-
Date	-
Depth (metres)	4778ft
Aquifer level (metres)	-
Static level (metres)	-
Drawdown (metres)	-
Aquifer type	-
Yield (litres/sec)	-
Test type	-
Bore cased to (metres)	-
Position	-
Owner	-
Address	-
Remarks	F I T No.3
Label No.	-

Results:

	mg/litre
Total solids by Summation in solution	3396

Chloride (Cl)	695
Carbonate (CO ₃)	38
Bicarbonate (HCO ₃)	910
Sulphate (SO ₄)	370
Nitrate (NO ₃)	19
Calcium (Ca)	73
Magnesium (Mg)	24
Sodium (Na)	1032
Potassium (K)	35
Iron-Total (Fe)	n.d.
Iron-Soluble (Fe)	200
Silicate (SiO ₂)	n.d.

Total hardness (as CaCO₃) 281

pH

8.43

Electrical Conductivity at 25°C.

4510

micromhos/cm

E. Little
CHIEF CHEMIST

Telephone 6519111

Ext. 1304

FM:MH

An. SL, CRM, 18/12

DR. 17.12.79

DEPARTMENT
OF
MINERALS AND ENERGY

CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

21 December 1979

Report on Sample No. 3674/79

U.W.R.S. 21047

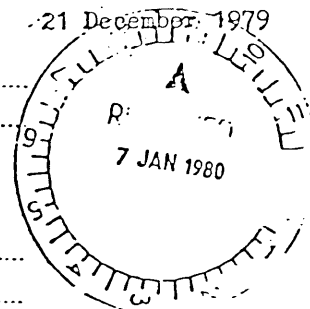
Sample: Bore Water

Locality: Parish Paaratte

Sender: D. Harrison

Beach Petroleum NL

360 Collins St., MELBOURNE Vic. 3000

Particulars:

Bore	-
Plant	-
Sample	-
Date	-
Depth (metres)	4100ft
Aquifer level (metres)	-
Static level (metres)	-
Drawdown (metres)	-
Aquifer type	-
Yield (litres/sec)	-
Test type	-
Bore cased to (metres)	-
Position	-
Owner	-
Address	-
Remarks	F I T No 4.
Label No.	-

Results:

		mg/litre
Total solids in solution	by summation	4196
<hr/>		
Chloride (Cl)		1523
Carbonate (CO ₃)		23
Bicarbonate (HCO ₃)		775
Sulphate (SO ₄)		279
Nitrate (NO ₃)		17
Calcium (Ca)		26
Magnesium (Mg)		12
Sodium (Na)		1465
Potassium (K)		24
Iron-Total (Fe)		n.d.
Iron-Soluble (Fe)		52
Silicate (SiO ₂)		n.d.
<hr/>		
Total hardness (as CaCO ₃)		115

pH 8.32

Electrical Conductivity at 25°C.

6300

micromhos/cm

S. M. Allen
CHIEF CHEMIST

APPENDIX - 5

GAS ANALYSES

BEACH PETROLEUM

FIT No. 1

NORTH PAARATTE No. 1

TOOL WAS SET AT 4902 FEET. RECOVERED 10 LITRES OF MUDDY WATER WITH MINOR OIL SCUM AND 0.532 CUBIC FEET OF GAS. RESISTIVITY OF THE WATER WAS 0.34 OHM/METER AT 65°F. CHROMATOGRAPHIC GAS ANALYSIS GAVE

C1.....198700 PPM 19.87% 97.67%
C2..... 4700 PPM 0.47% 2.31%
C3..... 40 PPM 0.01% 0.02%
C4 = C5 = C6 = NIL H2S ESTIMATED 2 PPM.

FIT No. 2

TOOL WAS SET AT 4791 FEET. RECOVERED 50 CUBIC FEET OF GAS AND 100 MILLILITRES OF CONDENSATE CUT MUD. GAS PRESSURE WAS 1550 PSI. RESISTIVITY OF MUD WAS 1.7 OHM/METER AT 74°F. CHROMATOGRAPHIC GAS ANALYSIS

C1 718600 PPM 71.86% 98.26%
C2 12120 PPM 1.21% 1.66%
C3 450 PPM 0.05% 0.06%
IC4 120 PPM 0.01% 0.02%
NC4 TRACE
C5 = C6 = H2S = NIL

FIT No. 3

TOOL WAS SET AT 4778 FEET. RECOVERED 31.3 CUBIC FEET OF GAS AND 600 MILLILITRES OF MUDDY WATER (PROBABLY FILTRATE) WITH MINOR CONDENSATE. RESISTIVITY OF THE WATER WAS 2.2 OHM/METER AT 66°F. GAS PRESSURE WAS 1550 PSI. THE CHROMATOGRAPHIC GAS ANALYSIS GAVE:

C1 776800 PPM 77.69% 98.52%
C2 11450 PPM 1.15% 1.45%
C3 150 PPM 0.02% 0.02%
IC4 80 PPM 0.01% 0.01%
NC4 TRACE
C5 = C6 = H2S = NIL

FIT No. 4

TOOL WAS SET AT 4110 FEET. RECOVERED 10 LITRES OF WATER. RESISTIVITY OF THE WATER WAS 1.43 OHM/METER AT 58°F.

BEACH PETROLEUM N.L.

DRILL STEM TEST No. 3

NORTH PAARATTE No. 1

INTERVAL TESTED: 4735 - 4771 FEET

DATE: 20/11/1979

THE PACKER WAS SET AT 4735 FEET WITH NO CUSHION. THE TOOL WAS INITIALLY OPENED FOR 6 MINUTES WITH A STRONG BLOW TO SURFACE IN 30 SECONDS. THE TOOL WAS THEN CLOSED FOR 30 MINUTES. TOOL REOPENED FOR 59 MINUTES WITH AN ESTIMATED FLOW OF 7 MILLION CUBIC FEET PER DAY. TOOL WAS THEN CLOSED FOR 123 MINUTES WITH A RAPID PRESSURE BUILD-UP. TOOL PULLED FREE. NO LIQUID RECOVERY. BOTTOM HOLE TEMPERATURE WAS 124°F.

FIRST FLOW PERIOD

TOP AT 4725 FEET: IH 1.65, 2398 PSI: IF & FF NOT RECORDED/MUD COVERED: FCIF 1.36, 1975 PSI
BOTTOM AT 4771 FEET: IH 1.71, 2418 PSI.

SECOND FLOW PERIOD

TOP AT 4725 FEET: IF 0.94, 1363 PSI: FF 1.19, 1726 PSI: CIP 1.36, 1975 PSI: FH 1.65, 2398 PSI
BOTTOM AT 4771 FEET: FF 1.40, 1976 PSI, FH 1.71, 2418 PSI

CHROMATOGRAPHIC GAS ANALYSIS

Table with 3 columns: INITIAL FLOW, 5 MINUTES INTO FINAL FLOW, 52 MINUTES INTO FINAL FLOW. Rows include GAS (C1, C2, C3, IC, NC4, IC5, NC, C, H2S) and values for PPM and percentages.

CORE LABORATORIES INTERNATIONAL LTD.

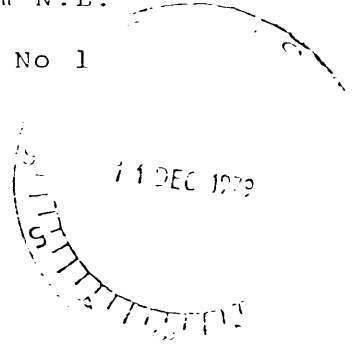
Petroleum Reservoir Engineering

SINGAPORE

Circle
J.H.H.
1987
W.L.
K.C.S.
D.H.
Ang 11/12

GAS ANALYSIS

COMPANY Beach Petroleum N.L.
DST/PROD'N TEST DST # 3
WELL North Parratte No 1
SAMPLING POINT 1350 psi
FIELD Wildcat
AREA Victoria
COUNTRY Australia
FILE WA-GA-2



<u>COMPONENTS</u>	<u>MOL %</u>	<u>G.P.M.</u>
Hydrogen	.....	.....
Helium	.....	.....
Carbon Monoxide	.....	.....
Hydrogen Sulphide	.....	.....
Carbon Dioxide	0.30	.....
Oxygen	.....	.....
Nitrogen	1.32	.....
Methane	96.85	.....
Ethane	1.27	0.320
Propane	0.04	0.011
Iso-Butane	0.05	0.016
N-Butane	.....	.....
Iso-Pentane	.....	.....
N-Pentane	.....	.....
Hexanes	0.04	0.016
Heptanes Plus	0.22	0.100
TOTAL= 100.09		

CALCULATED GAS GRAVITY= 0.577 GPM= 0.463

CALCULATED GROSS HEATING VALUE= 1017.584 BTU per cubic foot of dry gas @ 14.696 psia and 60 °F

COLLECTED @ 1350 psig and _____ °F ON _____

REMARKS:

CORE LABORATORIES INTERNATIONAL LTD.

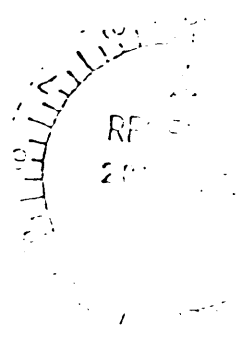
Petroleum Reservoir Engineering

SINGAPORE

JAH

GAS ANALYSIS

COMPANY Beach Petroleum N.L.
 DST/PROD'N TEST
 WELL North Parratte No 1
 SAMPLING POINT Wellhead
 FIELD Wildcat
 AREA Victoria
 COUNTRY Australia
 FILE WA-GA-2



<u>COMPONENTS</u>	<u>MOL %</u>	<u>G.P.M.</u>
Hydrogen	.....	.....
Helium	.....	.....
Carbon Monoxide	.....	.....
Hydrogen Sulphide	.....	.....
Carbon Dioxide	0.28	.....
Oxygen	.....	.....
Nitrogen	1.45	.....
Methane	96.92	.....
Ethane	1.29	0.325
Propane	0.07	0.019
Iso-Butane	0.04	0.013
N-Butane	.....	.....
Iso-Pentane	.....	.....
N-Pentane	.....	.....
Hexanes	0.01	0.004
Heptanes Plus	0.20	0.091
TOTAL:	100.26	.....

CALCULATED GAS GRAVITY = 0.575 GPM = 0.452

CALCULATED GROSS HEATING VALUE = 1016.584 BTU per cubic foot of dry gas @ 14.696 psia and 60 °F

COLLECTED @ 1706 psig and 78 °F ON 10th Dec '79

REMARKS:

APPENDIX - 6

UNWASHED, CANNED CUTTINGS GEOCHEMICAL RESULTS

DH.
JAH.
[Signature]
Telephone: 499111
Telegrams: BUROMIN
Telex: 62109

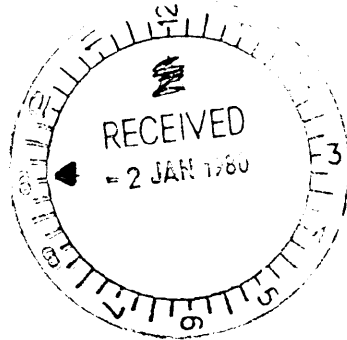


BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS

CNR CONSTITUTION AVENUE AND ANZAC PARADE, CANBERRA
Postal address: P O Box 378, Canberra City, A.C.T. 2601
Please address all communications to the Director

Department of National Development and Energy

In reply please quote: 78/987



21 December 1979

Beach Petroleum N.L.,
360 Collins Street,
MELBOURNE, VIC. 3000

Attention: Mr D. Harrison

Dear Sir,

Please find enclosed the C₁-C₄ gas analyses for the 31 canned cuttings samples submitted by you from the North Paaratte No. 1 well. As pointed out by Dr K. Jackson in a telephone conversation with you on 20 December, some problems were encountered with the cans due to their being overfilled. The technique involves agitation of the can followed by a direct sampling by syringe of the head space gas above the cuttings. For effective sampling, the head space should represent a minimum 20% of the total volume.

While the analysis itself is now working well, we are still uncertain of the data interpretation due to an insufficient calibration of our technique at this time. However, the obtained results will hopefully be of some value to you.

Yours faithfully,

(E.R. SMITH)
Ag/Assistant Director (Petroleum Exploration)

C1 - C4 HYDROCARBON ANALYSIS - CUTTINGS AND AIR SPACE

NORTH PARANITE No. 1

GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)

GAS COMPOSITION (PERCENT)

DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE iC4	NBUTANE nC4	TOTAL C1-C4	WET/TOTAL PERCENT(%)	M	E	P	TOTAL GAS iB	nB
2000.0	0.846	1.115	0.068	0.000	0.000	2.030	58.302	41.7	54.9	3.4	0.0	0.0
2100.0	2.604	0.285	0.036	0.000	0.000	2.926	10.975	89.0	9.7	1.2	0.0	0.0
2200.0	1.233	0.247	0.102	0.000	0.000	1.581	22.026	78.0	15.6	6.4	0.0	0.0
2300.0	0.759	0.332	0.104	0.000	0.048	1.241	38.962	61.0	26.7	8.4	0.0	3.9
2400.0	1.615	2.648	0.065	0.048	0.000	4.475	63.907	36.1	59.2	1.5	1.1	2.2
2500.0	0.050	1.454	0.138	0.000	0.000	1.642	96.978	3.0	88.6	8.4	0.0	0.0
2600.0	11.746	3.481	0.137	0.176	0.235	15.776	25.544	74.5	22.1	0.9	1.1	1.5
2700.0	1.286	0.277	0.030	0.040	0.024	1.658	22.411	77.6	16.7	1.8	2.4	1.5
2800.0	65.078	21.916	0.168	0.063	0.087	87.312	25.465	74.5	25.1	0.2	0.1	0.1
2900.0	171.511	36.629	0.233	0.037	0.232	208.642	17.796	82.2	17.6	0.1	0.0	0.1
3000.0	16.454	5.102	0.113	0.039	0.259	21.967	25.098	74.9	23.2	0.5	0.2	1.2
3100.0	8.254	2.524	0.064	0.014	0.157	11.013	25.054	74.9	22.9	0.6	0.1	1.4
3200.0	272.077	4.600	0.034	0.004	0.114	276.879	1.734	98.3	1.7	0.0	0.0	0.0
3300.0	40.517	0.609	0.031	0.004	0.074	41.235	1.741	98.3	1.5	0.1	0.0	0.2
3400.0	25.986	0.888	0.098	0.071	0.163	27.205	4.482	95.5	3.3	0.4	0.3	0.6
3500.0	95.804	1.436	0.087	0.052	0.196	97.575	1.815	98.2	1.5	0.1	0.1	0.2
3600.0	180.991	4.245	0.100	0.041	0.104	185.480	2.421	97.6	2.3	0.1	0.0	0.1
3700.0	33.475	8.757	0.138	0.017	0.117	42.504	21.243	78.8	20.6	0.3	0.0	0.3
3800.0	376.107	11.819	0.138	0.099	0.075	388.239	3.125	96.9	3.0	0.0	0.0	0.0
3900.0	523.110	12.182	0.185	5.895	6.888	548.259	4.587	95.4	2.2	0.0	1.1	1.3
4000.0	506.307	13.332	0.322	5.429	6.422	531.812	4.796	95.2	2.5	0.1	1.0	1.2
4100.0	60.023	1.663	0.060	0.937	1.622	64.305	6.659	93.3	2.6	0.1	1.5	2.5
4200.0	112.243	1.309	0.046	0.676	1.091	115.364	2.706	97.3	1.1	0.0	0.6	0.9
4300.0	150.818	2.441	0.203	0.887	1.229	155.579	3.060	96.9	1.6	0.0	0.6	0.8
4400.0	135.905	11.959	9.561	3.240	3.347	164.012	17.137	82.9	7.3	5.8	2.0	2.0
4500.0	204.398	72.744	87.129	9.824	6.632	380.728	46.314	53.7	19.1	22.9	2.6	1.7
4600.0	301.396	102.139	109.215	25.164	21.261	559.176	46.100	53.9	18.3	19.5	4.5	3.8
4700.0	183.529	107.112	29.562	28.585	12.880	361.669	49.255	50.7	29.6	8.2	7.9	3.6
4800.0	417.296	95.163	3.825	1.942	0.641	518.867	19.576	80.4	18.3	0.7	0.4	0.1
4900.0	849.205	395.920	53.405	15.333	7.392	1321.255	35.727	64.3	30.0	4.0	1.2	0.6
5000.0	763.040	303.302	126.410	32.779	19.205	1244.735	38.699	61.3	24.4	10.2	2.6	1.5

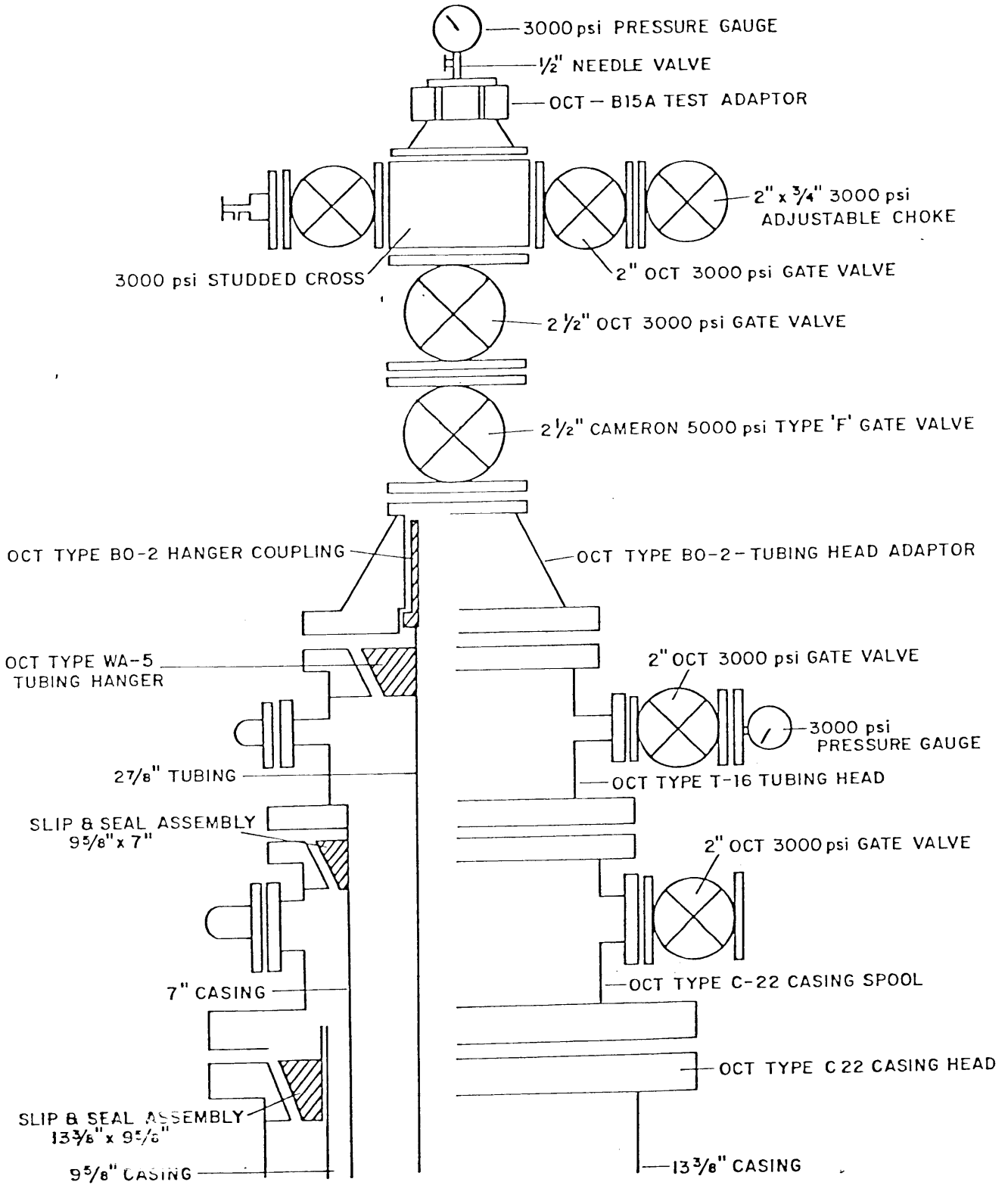
Values shown as zero are too small for computation

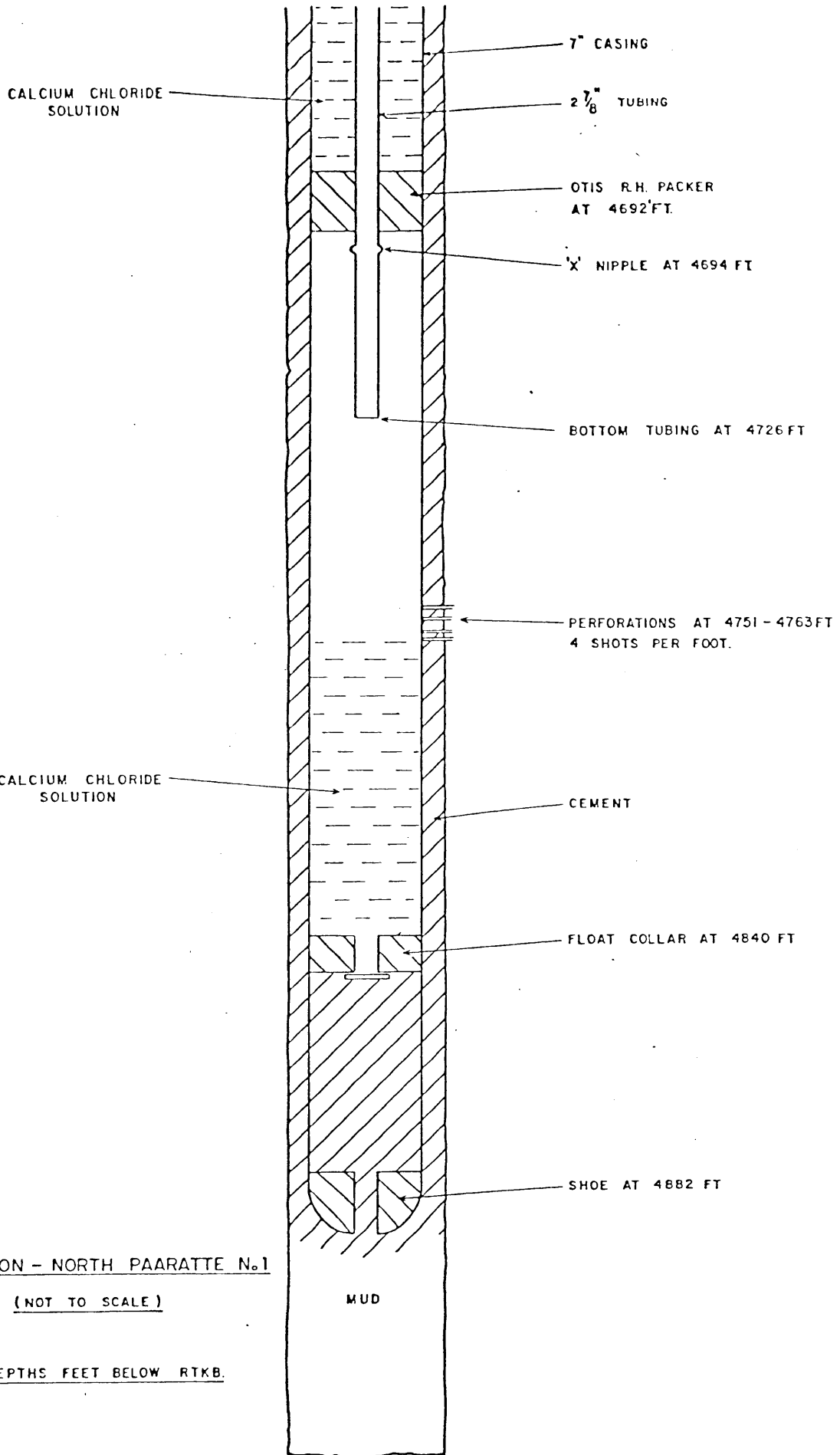
APPENDIX - 7

COMPLETION DETAILS

BEACH PETROLEUM N.L.

CHRISTMAS TREE — NORTH PAARATTE 1





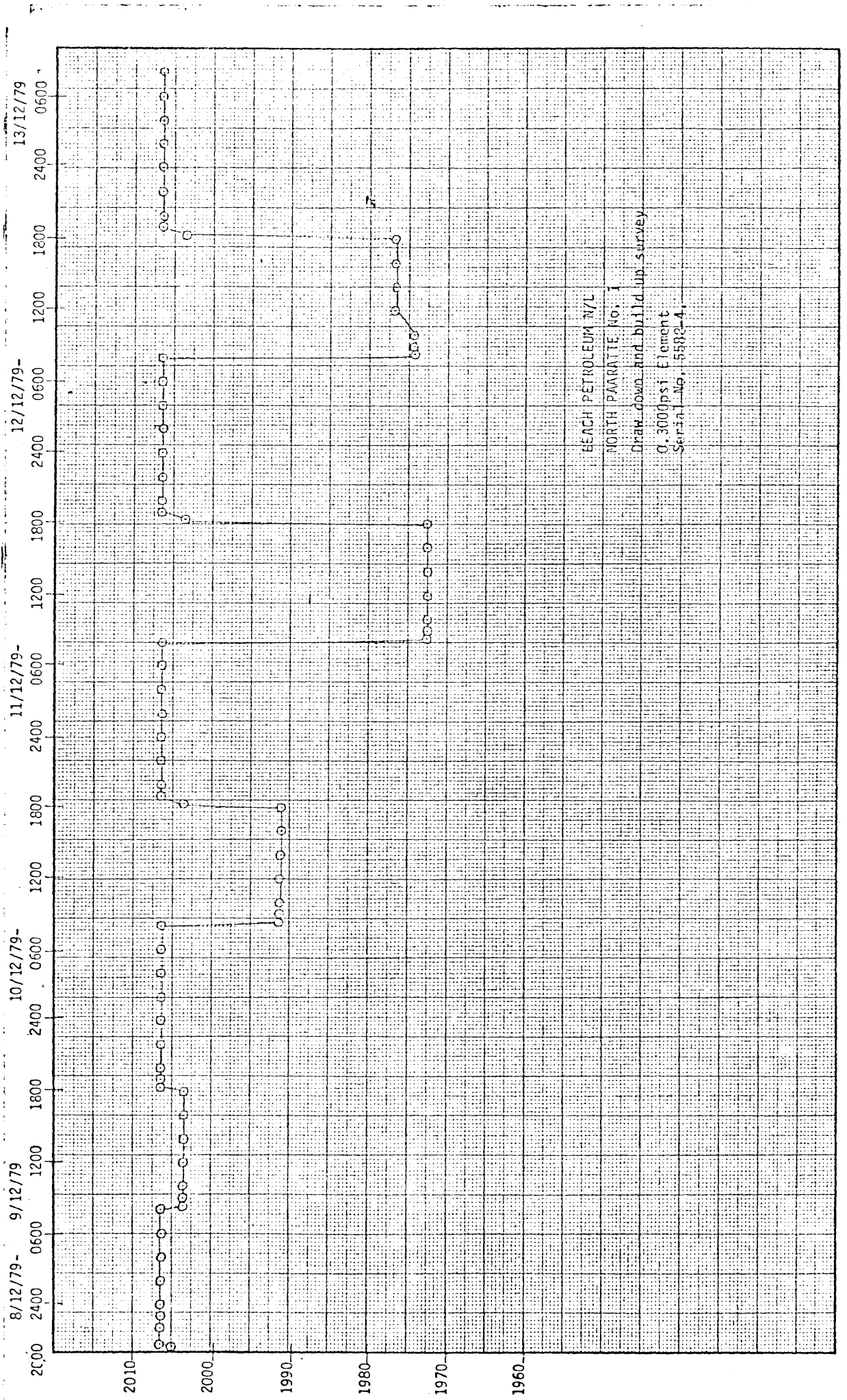
COMPLETION - NORTH PAARATTE No. 1

(NOT TO SCALE)

ALL DEPTHS FEET BELOW RTKB.

APPENDIX 8

PRODUCTION TESTING



GO INTERNATIONAL AUSTRALIA LIMITED
P.O. BOX 380
SALE, VICTORIA 3850.

BEACH PETROLEUM P/L

NORTH PAARATTE

NORTH PAARATTE No. 1
December 8-13, 1979.

Type and Purpose of Survey: 4 point draw down
Instrument Used : Amerada 0-3000psi - Instrument No. 5588-N

Hours	True Defl	P.S.I.G.	Remarks
December 8, 1979			
1630			Run in hole
1806			Hang @ 4790M
1838			Flow well for Cleanup
2003			Shut well in
2015	1.321	2004.96	
2030	1.322	2006.49	
2100	1.322	2006.49	
2200	1.322	2006.49	
2300	1.322	2006.49	
2400	1.322	2006.49	
December 9, 1979			
0200	1.322	2006.49	
0400	1.322	2006.49	
0600	1.322	2006.49	
0800	1.322	2006.49	Flow well
0815	1.320	2003.42	
0830	1.320	2003.42	
0845	1.320	2003.42	
0900	1.320	2003.42	
1100	1.320	2003.42	
1200	1.320	2003.42	
1400	1.320	2003.42	
1600	1.320	2003.42	
1800	1.320	2003.42	Shut in well
1815	1.322	2006.49	
1830	1.322	2006.49	
1900	1.322	2006.49	
2000	1.322	2006.49	
2200	1.322	2006.49	
December 10, 1979.			
0200	1.322	2006.49	
0400	1.322	2006.49	
0600	1.322	2006.49	
0800	1.322	2006.49	Flow well
0815	1.312	1991.16	
0830	1.312	1991.16	
0900	1.312	1991.16	
1000	1.312	1991.16	
1200	1.312	1991.16	

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850

Continued.....

<u>Hours</u>	<u>True Delf</u>	<u>P.S.I.G.</u>	<u>Remarks</u>
December 10, 1979			
1400	1.312	1991.16	
1600	1.312	1991.16	
1800	1.312	1991.16	Shut in well
1815	1.321	2004.96	
1830	1.322	2006.49	
1900	1.322	2006.49	
2000	1.322	2006.49	
2200	1.222	2006.49	
2400	1.222	2006.49	
December 11, 1979.			
0200	1.222	2006.49	
0400	1.222	2006.49	
0600	1.222	2006.49	
0800	1.222	2006.49	Flow well
0815	1.310	1972.76	
0830	1.310	1972.76	
0900	1.310	1972.76	
1000	1.310	1972.76	
1200	1.310	1972.76	
1400	1.310	1972.76	
1600	1.310	1972.76	
1800	1.310	1972.76	Shut in well
1815	1.321	2004.96	
1830	1.321	2004.96	
1900	1.322	2006.49	
2000	1.322	2006.49	
2200	1.322	2006.49	
2400	1.322	2006.49	
December 12, 1979			
0200	1.322	2006.49	
0400	1.322	2006.49	
0600	1.322	2006.49	
0800	1.322	2006.49	Flow well
0815	1.301	1974.29	
0830	1.301	1974.29	
0900	1.301	1974.29	
1000	1.301	1974.29	
1200	1.302	1975.32	
1400	1.302	1975.32	
1600	1.302	1975.32	
1800	1.302	1975.32	Shut in well
1815	1.321	2004.96	
1830	1.322	2006.49	
1900	1.322	2006.49	

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850

Continued

NORTH PAARATTE No. 1

<u>Hours</u>	<u>True Defl</u>	<u>P.S.I.C.</u>	<u>Remarks</u>
December 12, 1979			
2000	1.322	2006.49	
2200	1.322	2006.49	
2400	1.322	2006.49	
December 13, 1979			
0200	1.322	2006.49	
0400	1.322	2006.49	
0600	1.322	2006.49	
0800	1.322	2006.49	Come out of hole.

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850.

BEACH PETROLEUM N/L

EXPLORATION

PAARATTE No. 1
December 8 - 13, 1979

OPERATIONS SCHEDULE

<u>Hours</u>	<u>Remarks</u>
December 8, 1979	
0930	Arrive location - offload truck and commence to rig up separator and logging unit.
1418	Engage stylus Element No. 5588-N, 0-3000psi, 180hr clock.
1630	Start in hole with HP Probe #249, Temp tool and Amerada. Surface pressure 300psig
1806	Hang @ 1460M (4790')
1838	Opened well for cleanup flow - surface pressure @ 1910hrs 1530psig.
1938	Surface pressure 1615psi
2003	Shut in well
December 9, 1979	
0800	Open well for first rate
1800	Shut in - Monitor buildup
December 10, 1979	
0001 - 0800	Well shut in, monitoring build up
0800	Open well for second flow rate
1530	Take wellhead gas sample @ 1706psi, 78 ⁰ F. 700cc bottle
1600	Take separator gas sample @ 600psi, 42 ⁰ F. Small bottle
1800	Shut in for buildup
December 11, 1979	
0800	Open well for third flow rate
1800	Shut in for build up
December 12, 1979	
0800	Open well for 4th flow rate
1600	Shut in for final build up period
December 13, 1979	
0750	Commence gradient survey and start to tear out equipment
1100	Finish gradient survey and commence to rig down.
1130	Disengage stylus on 3000psi Amerada
1400	Depart Port Campbell for Sale.

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850.

BEACH PETROLEUM N/L

EXPLORATION

NORTH PAARATTE No. 1
December 8 - 13, 1979

Type of Test: 4 point draw down

Hours	Elapsed Time	Tubing Press	Casing Press	Well Head Temp	Diff Press H2O	Static Press	Separator Temp F ^o	Gas Volume MCF/day	Oriface Plate
December 8, 1979								MMSCF?	
Well shut in after clean up flow @ 2003"									
2030		1775							
2045		1776							
2100		1776							
2115		1776							
2130		1775							
2145		1775							
2206		1775							
2230		1775							
2300		1775							
2400		1775							
December 9, 1979.									
0100		1775							
0200		1775							
0300		1775							
0400		1775							
0500		1775							
0600		1775							
0700		1775							
0800		1770							
0830	Open well for first rate @ 0800 hours								
0830	1/2	1755	25		40	400	20	2.28	1.5"
0845	3/4	1756			54	320	16	2.28	1.5"
0900	1.	1756	35		58	330	14	2.28	1.5"
0915	1-1/4	1756	35		48	300	14	2.28	1.5"
0930	1-1/2	1756	50		70	260	15	2.28	1.5"
0945	1-3/4	1756	55	70	62	290	16	2.28	1.5"
1000	2.	1756	65	70	62	300	17	2.28	1.5"
1015	2-1/4	1755	75	71	62	290	18	2.28	1.5"
1030	2-1/2	1755	85	71	70	260	18	2.28	1.5"
1045	2-3/4	1755	95	70	72	250	18	2.28	1.5"
1100	3.	1755	100	71	73	250	20	2.28	1.5"
1115	3-1/4	1755	110	72	75	260	20	2.28	1.5"
1130	3-1/2	1754	120	72	72	260	20	2.28	1.5"
1145	3-3/4	1754	125	72	72	260	21	2.28	1.5"
1200	4.	1754	135	73	72	260	22	2.28	1.5"
1215	4-1/4	1754	140	73	72	260	23	2.28	1.5"
1230	4-1/2	1754	150	73	72	260	23	2.28	1.5"

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTOIRA 3850.

BEACH PETROLEUM N/L

EXPLORATION

NORTH PAARATTIE No. 1
December 8 - 13, 1979.

Continued.....

Hours	Elapsed Time	Tubing Press	Casing Press	Well Head Temp	Diff Press H2O	Static Press	Separator Temp F ^o	Gas Volume MCF/day	Oriface Plate
December 9, 1979									
1245	4-3/4	1754	150	74	74	255	24	2.28	1.5"
1300	5.	1752	155	74	74	260	24	2.28	1.5"
1315	5-1/4	1752	160	74	74	260	24	2.28	1.5"
1330	5-1/2	1752	165	74	74	260	24	2.28	1.5"
1345	5-3/4	1751	175	75	74	260	24	2.28	1.5"
1400	6.	1751	175	75	74	260	24	2.28	1.5"
1415	6-1/4	1750	180	76	75	260	24	2.28	1.5"
1430	6-1/2	1750	180	77	76	260	24	2.28	1.5"
1445	6-3/4	1750	190	76	76	260	24	2.28	1.5"
1500	7.	1750	195	76	76	260	24	2.28	1.5"
1515	7-1/4	1750	195	76	76	260	25	2.28	1.5"
1530	7-1/2	1750	200	75	78	260	25	2.28	1.5"
1545	7-3/4	1750	200	76	74	260	25	2.28	1.5"
1600	8.	1750	200	76	74	260	25	2.28	1.5"
1630	8-1/2	1750	210	75	76	260	25	2.28	1.5"
1700	9.	1750	220	69	76	260	25	2.28	1.5"
1730	9-1/2	1750	225	75	76	260	25	2.28	1.5"
1800	10.00	1749	225	75	76	255	25	2.28	1.5"
1800	Shut well in								
1801		1770	225						
1802		1770	225						
1803		1770	225						
1804		1770	225						
1805		1770	225						
1810		1770	205						
1815		1770	200						
1845		1774							
1900		1774							
2000		1774							
2100		1773							
2200		1772							
2300		1772							
2400		1770							
December 10, 1979.									
0100		1770							
0200		1770							
0300		1770							
0400		1770							
0500		1770							
0600		1770							
0700		1770							
0755		1770	10	58	Well shut in since 1800hours December 9, 1979.				

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850.

BEACH PETROLEUM N/L

EXPLORATION

NORTH PAARATTE No. 1

Continued.....

Hours	Elapsed Time	Tubing Press	Casing Press	Well Head Temp	Diff Press H2O	Static Press	Separator Temp F	Gas Volume MCF/day	Oriface Plate
December 10, 1979									
0800	Open well for second rate								
0801		1730	20	61					
0802		1710	20	62					
0803		1700	20	63					
0804		1700	20	64					
0805		1700	20	64					
0806		1700	20	65					
0807		1700	20	65					
0808		1700	20	66					
0809		1700	20	66					
0810		1700	25	66					
0815	1/4	1700	25	68					
0820		1700	35	69					
0830	1/2	1700	65	70					
0845	3/4	1700	105	70					
0900	1.								
0915	1-1/4								
0920		1700	220	72	172	560	30	5.48	1.5"
0930	1-1/2	1700	220	72	170	560	34	5.48	1.5"
0945	1-3/4	1698	250	73	174	560	35	5.48	1.5"
1000	2.	1695	275	74	178	570	36	5.48	1.5"
1015	2-1/4	1695	280	74	188	560	37	5.48	1.5"
1030	2-1/2	1695	280	74	188	560	37	5.48	1.5"
1045	2-3/4	1700	300	70	190	560	37	5.48	1.5"
1100	3.	1700	325	73	190	560	38	5.48	1.5"
1115	3-1/4	1700	360	75	192	560	38	5.48	1.5"
1130	3-1/2	1705	390	74	186	580	38	5.48	1.5"
1200	4.	1705	400	74	190	580	39	5.48	1.5"
1230	4-1/2	1706	440	74	186	600	41	5.48	1.5"
1300	5.	1706	450	74	184	600	41	5.48	1.5"
1400	6.	1705	480	75	184	600	42	5.48	1.5"
1500	7.	1707	520	78	186	600	42	5.48	1.5"
1600	8.	1706	530	78	186	600	42	5.48	1.5"
1700	9.	1705	550	79	188	600	44	5.48	1.5"
1800		1705	575	77	188	600	42	5.48	1.5"
1801		1780							
1802		1780							
1803		1780							
1804		1780							
1805		1780							
1810		1780							
1815		1780							
1820		1775							
1825		1775							

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850.

BEACH PETROLEUM N/L

EXPLORATION

NORTH PAARATTE No. 1

Continued.....

Hours	Elapsed Time	Tubing Press	Casing Press	Well Head Temp	Diff Press H2O	Static Press	Separator Temp °F	Gas Volume MCF/day	Oriface Plate
December 10, 1979									
1830		1775							
1900		1775	400						
2000		1775	280						
2100		1775	210						
2200		1775	160						
2300		1775	125						
2400		1775	95						
December 11, 1979									
	Well shut in								
0100		1775	65						
0200		1775	50						
0300		1775	30						
0400		1774	25						
0500		1774	20						
0600		1773	15						
0700		1772	15						
0800		1770	5	57	Opened well for 3rd rate				
0801		1685	5	59					
0802		1680	10	61					
0803		1675	20	63					
0804		1675	20	65					
0805		1673	20	66					
1810		1666	45	69					
0815		1660	70	72					
0830		1658	185		106	610	36	7.52	1.875
0845		1660	225		106	610	37	7.52	1.875
0900		1655	275		106	610	38	7.52	1.875
0915		1650	325		106	610	38	7.52	1.875
0930		1650	350		108	610	40	7.52	1.875
0945		1660	390	75	112	600	40	7.52	1.875
1000		1660	410	76	114	600	40	7.52	1.875
1030		1660	455	76	114	600	40	7.52	1.875
1100		1655	500	76	116	600	41	7.52	1.875
1130		1655	525	77	120	600	43	7.52	1.875
1200		1655	550	79	120	600	44	7.52	1.875
1230		1655	600	79	120	600	45	7.52	1.875
1300		1655	610	80	122	600	45	7.52	1.875
1330		1655	620	80	122	600	46	7.52	1.875
1400		1655	625	80	122	600	46	7.52	1.875
1430		1655	635	83	124	600	46	7.52	1.875

GO INTERNATIONAL AUSTRALIA
P.O. BOX 380
SALE, VICTORIA 3850

BEACH PETROLEUM N/L

EXPLORATION

NORTH PAARATTE No. 1

Continued.....

Hours	Elapsed Time	Tubing Press	Casing Press	Well Head Temp	Diff Press H2O	Static Press	Separator Temp °F	Gas Volume MCF/day	Oriface Plate
December 11, 1979									
1500		1660	650	83	122	600	47	7.52	1.875
1530		1660	665	83	126	600	48	7.52	1.875
1600		1660	675	82	128	600	48	7.52	1.875
1630		1660	680	88	128	600	48	7.52	1.875
1700		1660	690	93	128	600	48	7.52	1.875
1730		1660	700	86	128	600	48	7.52	1.875
1800		1660	700	93	128	600	48	Well shut.in	1.875
1801		1780	700						
1802		1780	700						
1805		1780	675						
1810		1780	655						
1820		1733	615						
1830		1783	570						
1840		1783	550						
1850		1783	520						
1900		1783	485						
1930		1782	430						
2000		1781	385						
2100		1778	300						
2200		1775	245						
2300		1778	195						
2400		1778	160						
December 12, 1979									
0100		1778	130						
0200		1778	105						
0300		1778	95						
0400		1778	65						
0500		1778	45						
0600		1775	25						
0700		1773	25						
0800		1775	20	52					
0801		1600	20	55					
0802		1595	20	61					
0803		1590	25	62					
0804		1585	30	65					
0805		1580	50	65					
0810		1575	100	67					
1815		1575	135	71	164	700	34	9.72	1.875
0820		1575	185	74	164	700	42	9.72	1.875
0830		1570	230	74	166	700	44	9.72	1.875

APPENDIX 9

FORMATION TESTING SERVICE REPORT

Casing perms _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 002627
 Gas gravity _____ Oil gravity _____ GOR _____
 Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

Date Time	Choke Size	Surface Pressure psi	Gas Rate MCF	Liquid Rate BPD	Remarks
11-20-79 a.m. p.m.					
139					Made up tools and went in hole.
611	7/16"				Opened tool with a strong blow.
					Gas to the surface in 30 seconds.
612		60			
615		870			
616		910			
617					Closed tool.
647					Reopened tool.
650		770			
655		1250			
700		1325			
705		1350			
710		1350			
715		1350			
720		"			
725		"			
730		"			
740		"	7 MMCF		
745		1350			
746		"			Closed tool.
949					Pulled tools loose. Pulled out of hole.

Gauge No. 1040		Depth 4725'		Clock No. 7375		24 hour		Ticket No. 002627			
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period		Third Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0.000	1488.4	.000	1545.3	.000	1290.4	.000	1735.3				
1.015	1545.3	.0033	1976.6	.0298**	1663.7	.0033	1975.1				
2		.0066	1976.6	.0628	1744.1	.0066	1975.1				
3		.0100	1976.6	.0959	1742.6	.0098	1978.0				
4		.0133	1978.0	.1289	1741.2	.0131	1978.0				
5		.0166	1978.0	.1620	1736.8	.0164	1978.0				
6		.0199	1978.0	.1950	1735.3	.0197	1978.0				
7		.0232	1978.0			.0230	1978.0				
8		.0266	1978.0			.0262	1978.0				
9		.0299	1978.0			.0295	1978.0				
10		.0332	1978.0			.0328	1978.0				
11		.0365	1978.0			.1084	1978.0				
12		.0531	1978.0			.1839	1978.0				
13		.0697	1978.0			.2595	1978.0				
14		.0864	1978.0			.3550	1978.0				
15		.1030	1978.0			.4040	1978.0				

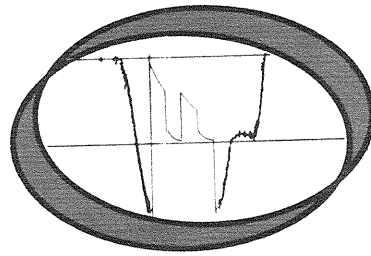
Gauge No. 1744		Depth 4767'		Clock No. 6719		24 hour	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0.000	1982.1	.000	1977.3	.000	1977.3	.000	1977.3
1.015	1977.3	.101	1978.7	.1940	1977.3	.407	1978.7
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Reading Interval *

REMARKS: * = First 11 intervals are equal to 1 minute each; the next 4 intervals are equal to 5 minutes each;
 ** = 9 minute interval; *** = First 10 intervals are equal to 1 minute each; the next 4 intervals are equal to 23 minutes each; the last interval is equal to 21 minutes.....

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	6"	3"	1'	
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4.5"	3.826"	4183.33'	
Drill Collars	6"	2.375"	525.07'	
Handling Sub & Choke Assembly	5"	1.62"	5'	
Dual CIP Valve				
Dual CIP Sampler	5"	.75"	5'	4720'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	4725'
Hydraulic Jar	5"	1"	3.3'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly	7.75"	1.75"	6'	4735'
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"		31'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	4767'
Total Depth				4771'

Formation Testing Service Report



NOMENCLATURE

b	= Approximate Radius of Investigation	Feet
b₁	= Approximate Radius of Investigation (Net Pay Zone h ₁)	Feet
D.R.	= Damage Ratio	—
EI	= Elevation	Feet
GD	= B.T. Gauge Depth (From Surface Reference)	Feet
h	= Interval Tested	Feet
h₁	= Net Pay Thickness	Feet
K	= Permeability	md
K₁	= Permeability (From Net Pay Zone h ₁)	md
m	= Slope Extrapolated Pressure Plot (Psi ² /cycle Gas)	psi/cycle
OF₁	= Maximum Indicated Flow Rate	MCF/D
OF₂	= Minimum Indicated Flow Rate	MCF/D
OF₃	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF₄	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{or}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q₁	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

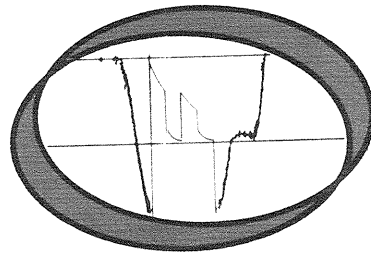
FLUID SAMPLE DATA				Date 11-17-79		Ticket Number 002725	
Sampler Pressure _____ P.S.I.G. at Surface				Kind of Job HOOK WALL TEST		Halliburton District AUSTRALIA	
Recovery: Cu. Ft. Gas _____ cc. Oil _____ cc. Water _____ cc. Mud _____ Tot. Liquid cc. _____				Tester PAUL LARKINS		Witness LARSON	
Gravity _____ ° API @ _____ ° F.				Drilling Contractor ODE RIG #12 PW			
Gas/Oil Ratio _____ cu. ft./bbl.				EQUIPMENT & HOLE DATA			
RESISTIVITY _____ CHLORIDE CONTENT _____				Formation Tested Nullawarra Greensand			
Recovery Water @ _____ ° F. _____ ppm				Elevation 315' _____ Ft.			
Recovery Mud @ _____ ° F. _____ ppm				Net Productive Interval 27' _____ Ft.			
Recovery Mud Filtrate @ _____ ° F. _____ ppm				All Depths Measured From Kelly Bushing			
Mud Pit Sample @ _____ ° F. _____ ppm				Total Depth 4119' _____ Ft.			
Mud Pit Sample Filtrate @ _____ ° F. _____ ppm				Main Hole/Casing Size 8 1/2"			
Mud Weight 9.6 vis 45 Sec. _____				Drill Collar Length 525.07' I.D. 2.375"			
				Drill Pipe Length 3532.33' I.D. 3.826"			
				Packer Depth(s) 4084' _____ Ft.			
				Depth Tester Valve 4069' _____ Ft.			
Cushion		TYPE	AMOUNT	Depth Back Pres. Valve	Surface Choke	Bottom Choke	
				Ft.	7/16"	3/4"	
Recovered		450	Feet of mud.				
Recovered			Feet of				
Recovered			Feet of				
Recovered			Feet of				
Recovered			Feet of				
Remarks - SEE PRODUCTION TEST DATA SHEET -							
TEMPERATURE		Gauge No. 1040	Gauge No. 1744	Gauge No.	TIME		
Depth:		4074 Ft.	4115 Ft.	Depth:	Hour Clock		
Est. °F.		24 Hour Clock	24 Hour Clock	Blanked Off		Tool Opened 727 A.M. P.M.	
Actual 122 °F.		Blanked Off NO	Blanked Off YES	Blanked Off		Opened Bypass 728 A.M. P.M.	
Pressures		Pressures		Pressures		Reported	Computed
Field		Office	Field	Office	Field	Office	Minutes
Initial Hydrostatic 2069		2061.2	2090	2087.1			Minutes
First Period	Flow Initial						
	Flow Final						
	Closed in						
Second Period	Flow Initial						
	Flow Final						
	Closed in						
Third Period	Flow Initial						
	Flow Final						
	Closed in						
Final Hydrostatic		2061.2	2087.1				

Legal Location Sec - Typ - Ring
 Lease Name NORTH PARATITE
 Well No. 1
 Test No. 1-A
 Tested Interval 4084' - 4119'
 County WILDCAT
 State VICTORIA
 Lease Owner/Company Name BEACH PETROLEUM N.L.



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing			1'	
Reversing Sub	6"	3"		
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	3532.33'	
Drill Collars	6"	2.375"	525.07'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	1.62"	5'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	4069'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	4074'
Hydraulic Jar	5"	1"	3.3'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly	7.75"	1.75"	6'	4084'
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"		30'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	4115'
Total Depth				4119'

Formation Testing Service Report



NOMENCLATURE

b	= Approximate Radius of Investigation	Feet
b₁	= Approximate Radius of Investigation (Net Pay Zone h ₁)	Feet
D.R.	= Damage Ratio	—
EI	= Elevation	Feet
GD	= B.T. Gauge Depth (From Surface Reference)	Feet
h	= Interval Tested	Feet
h₁	= Net Pay Thickness	Feet
K	= Permeability	md
K₁	= Permeability (From Net Pay Zone h ₁)	md
m	= Slope Extrapolated Pressure Plot (Psi ² /cycle Gas)	psi/cycle
OF₁	= Maximum Indicated Flow Rate	MCF/D
OF₂	= Minimum Indicated Flow Rate	MCF/D
OF₃	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF₄	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{oi}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q₁	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

NORTH PARAPATE

Well No. 1

Test No. 1-B

4066' - 4119'

BEACH PETROLEUM N.L.

Lease Owner/Company Name

Legal Location
Sec. - Twp. - Rng.

Lease Name

Well No.

Test No.

Field Area
Mud. From Tester Valve
WILDCAT

County

State

VICTORIA

FLUID SAMPLE DATA

Date 11-17-79 Ticket Number 002626

Kind of Job OPEN HOLE TEST Halliburton District AUSTRALIA

Tester PAUL LARKINS Witness LARSON ??

Drilling Contractor O D E #12 TJH

EQUIPMENT & HOLE DATA

Formation Tested Nullawarra Green Sand

Elevation 315' Ft.

Net Productive Interval 27' Ft.

All Depths Measured From Kelly Bushing

Total Depth 4119' Ft.

Main Hole/Casing Size 8 1/2"

Drill Collar Length 496.33' I.D. 2.375"

Drill Pipe Length 3543.07' I.D. 3.826"

Packer Depth(s) 4066' Ft.

Depth Tester Valve 4051' Ft.

Recovery: Cu. Ft. Gas _____ P.S.I.G. at Surface _____

cc. Oil _____

cc. Water _____

cc. Mud _____

Tot. Liquid cc. _____

Gravity _____ ° API @ _____ ° F.

Gas/Oil Ratio _____ cu. ft./bbl.

RESISTIVITY _____ CHLORIDE CONTENT _____

Recovery Water @ _____ ° F. _____ ppm

Recovery Mud @ _____ ° F. _____ ppm

Recovery Mud Filtrate @ _____ ° F. _____ ppm

Mud Pit Sample @ _____ ° F. _____ ppm

Mud Pit Sample Filtrate @ _____ ° F. _____ ppm

Mud Weight 9.6 vis 45 sec XXX

TYPE	AMOUNT	Depth Back Pres. Valve	Surface Choke	Bottom Choke
Cushion		Ft.	7/16"	3/4"
Recovered	10 Feet of mud.			
Recovered	Feet of			
Recovered	Feet of			
Recovered	Feet of			
Recovered	Feet of			

Remarks SEE PRODUCTION TEST DATA SHEET . . .

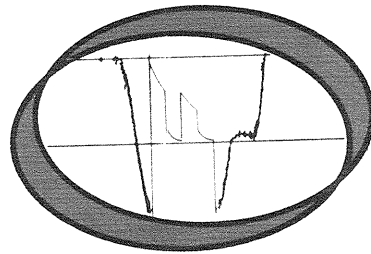
Q - Questionable . . .

TEMPERATURE	Gauge No. 1040		Gauge No. 1744		Gauge No.		TIME	
	Depth:	4056 Ft.	Depth:	4115 Ft.	Depth:	Ft.	Hour Clock	Tool
Est. °F.	24 Hour Clock		24 Hour Clock		Hour Clock		Tool	A.M.
	Blanked Off NO		Blanked Off -YES		Blanked Off		Opened	1627 P.M.
Actual 122 °F.	Pressures		Pressures		Pressures		Opened	A.M.
	Field	Office	Field	Office	Field	Office	Bypass	1703 P.M.
Initial Hydrostatic	2048	2046.6	2090	2081.4			Reported	Computed
First Period	Flow Initial	10.2		1657.2-0			Minutes	Minutes
	Flow Final	10.2		1712.4			19	
	Closed in	24.7	1707	1711.0			17	
Second Period	Flow Initial							
	Flow Final							
	Closed in							
Third Period	Flow Initial							
	Flow Final							
	Closed in							
Final Hydrostatic	2048	2045.1	2090	2081.4				

FORMATION TEST DATA

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	6"	3"	1'	
Reversing Sub				
Water Cushion Valve	4.5"	3.826"	3543.07'	
Drill Pipe	6"	2.375"	496.33'	
Drill Collars				
Handling Sub & Choke Assembly	5"	1.62"	5'	
Dual CIP Valve				
Dual CIP Sampler	5"	.75"	5'	4051'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	4056'
Hydraulic Jar	5"	1"	3.3'	
VR Safety Joint	5"	1"	2.9'	
Pressure Equalizing Crossover				
Packer Assembly				
Distributor				
Packer Assembly				
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly	7.75"	1.75"	6'	4066'
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars	6"	2.375"	28.74'	
Flush Joint Anchor	5"		18'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	4115'
Total Depth				4119'

Formation Testing Service Report



NOMENCLATURE

b	= Approximate Radius of Investigation	Feet
b₁	= Approximate Radius of Investigation (Net Pay Zone h ₁)	Feet
D.R.	= Damage Ratio	—
EI	= Elevation	Feet
GD	= B.T. Gauge Depth (From Surface Reference)	Feet
h	= Interval Tested	Feet
h₁	= Net Pay Thickness	Feet
K	= Permeability	md
K₁	= Permeability (From Net Pay Zone h ₁)	md
m	= Slope Extrapolated Pressure Plot (Psi ² /cycle Gas)	psi/cycle
OF₁	= Maximum Indicated Flow Rate	MCF/D
OF₂	= Minimum Indicated Flow Rate	MCF/D
OF₃	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF₄	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{or}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q₁	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

APPENDIX 10

BIT RECORD

