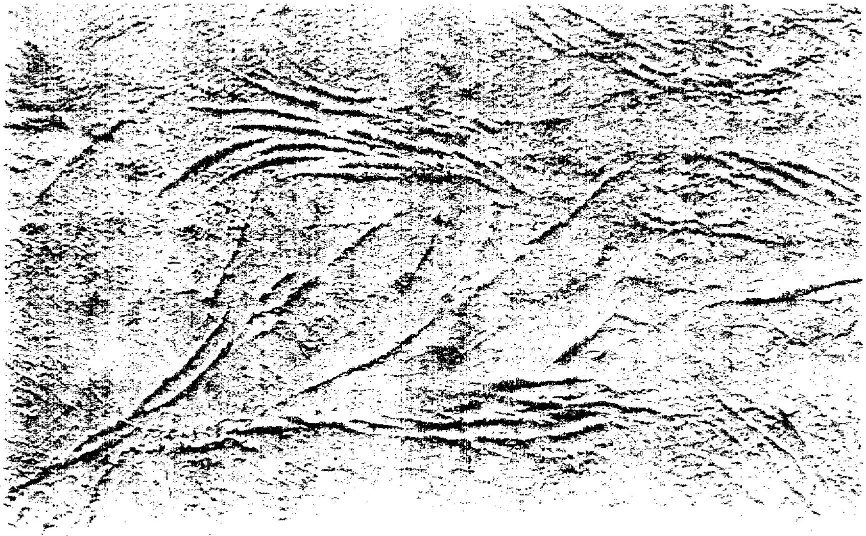


W809

WCR
CURDIEVALE-1
W809

BEACH PETROLEUM

BEACH PETROLEUM NO LIABILITY

CURDIEVALE NO. 1 P.E.P. 104

WELL COMPLETION REPORT

By

S M Guba
April 1983

CONTENTS

APPENDICES

FIGURES

TABLES

ENCLOSURES

SUMMARY

Curdievale No. 1 was drilled over an 8 day period from the 17th to the 25th March 1983, as a new field wildcat exploration well in the Peterborough area. P.E.P. 104, Otway Basin, Victoria.

The well was designed as a test of the Pebble Point Formation in a crestal position between Flaxmans-1 and Curdie-1 where gas and oil shows respectively, had been reported. Results confirmed Curdievale-1 as a crestal test.

At the secondary objective of the Dilwyn Formation level, the well failed to encounter either hydrocarbon fluorescence or gas above a background of 50-90 ppm - C_1. Wireline log interpretation indicates 100% water saturation in the cleaner sands of this formation.

At the primary objective level the porous and permeable sands of the Pebble Point Formation were tested (DST-1) with a recovery of 891 metres of fresh (540 ppm NaCl salinity) formation water. There were no hydrocarbon indications associated with the Pebble Point Formation. Wireline log interpretation concludes an Sw = 100%.

Complete and effective removal of hydrocarbon indications probably resulted from the movement of groundwaters through the high porosity sands at Pebble Point level.

The well was drilled by Petroleum Drilling Services of Australia Pty.Ltd., Kremco 750 Rig No. 1 with the following contract services:-

Halliburton Manufacturing and Services Ltd.	-	Testing and Cementing.
Schlumberger Seaco Inc.	-	Wireline Logging.
Exploration Logging of Australia Ltd.	-	Mud Logging.
Baroid N.L.	-	Mud Engineering.

Beach Petroleum N.L. was the operator for the well, which was drilled as an earning well for Gas and Fuel Exploration. This was the first of a series of operations whereby Gas and Fuel Exploration can earn a 50% interest in P.E.P. 104.

1. PURPOSE OF THE WELL

A significant oil show had been recorded during the drilling of the Curdie No. 1 well in the Pebble Point Formation from 1006 - 1030 metres K.B. The siting of a Pebble Point test in a crestal position assumed importance not only because Curdie No. 1 had been located on what was thought to be a crestal position at the Waarre level, but also because the Otway Basin regionally exhibits a marked disharmonic structural style through the geological column.

The earliest seismic surveys (1958-1961) revealed the major Curdievale anticline and prior to drilling Curdie No. 1, it was known to pass between Flaxmans No. 1 and Curdie No. 1. Recent detailed mapping indicated that a Pebble Point test located between Flaxmans No. 1 and Curdie No. 1 embraced a significant and untested closure. (See Figure 1)

The throw on the Boggy Creek and neighbouring faults is such that the mature Otway Group sediments have been brought into contact with the Paaratte Formation. Hydrocarbons could have been migrated through the Paaratte Formation to be reservoired in the Pebble Point Formation where porosities of 20-22% had been expected.

DEPTH STRUCTURE MAP FOR TOP PEBBLE POINT FORMATION

Contour Interval 10 Metres

Scale 1:35,000 approx.

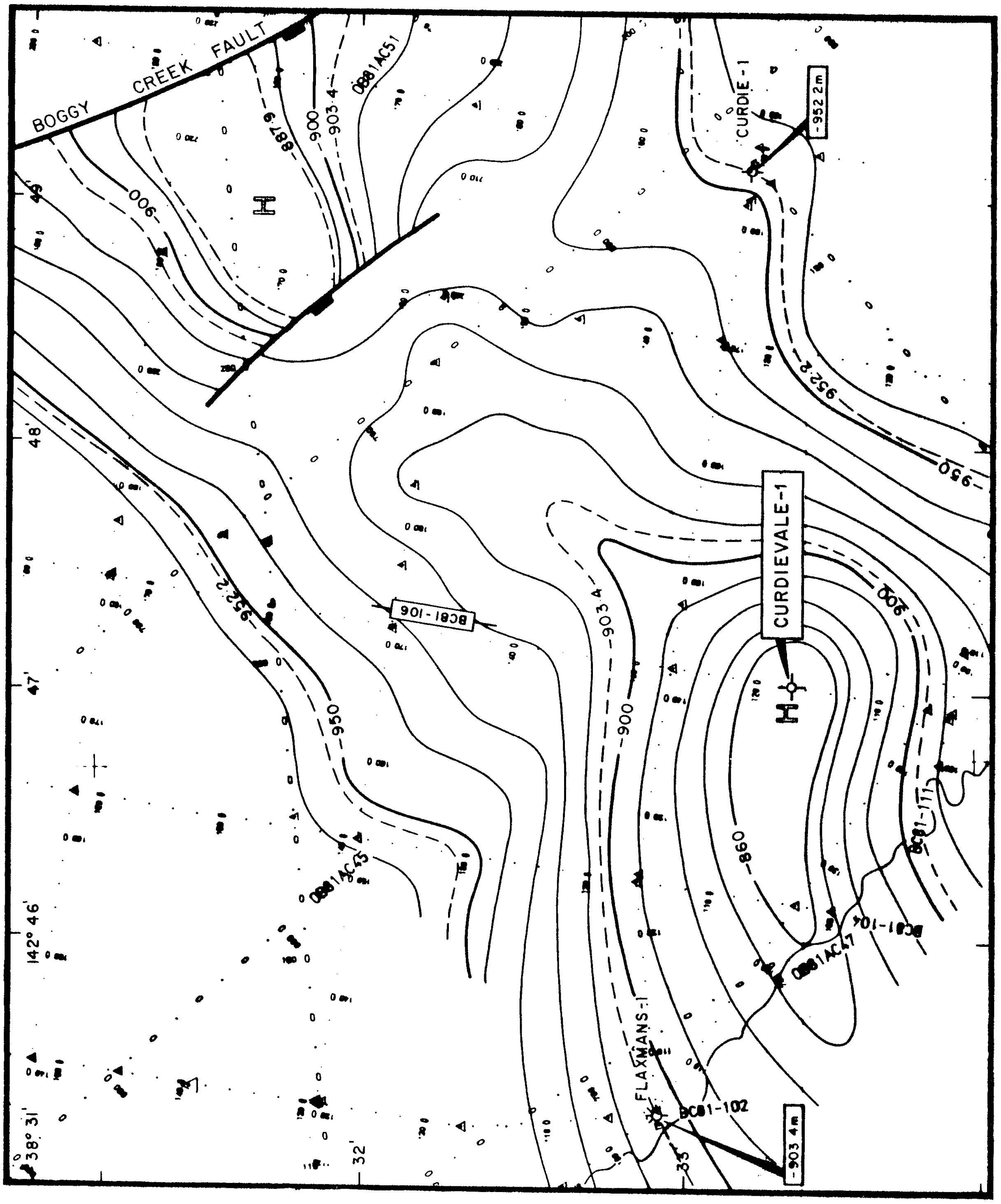


FIGURE 1

REGIONAL LOCATION MAP

VICTORIA PEP 104

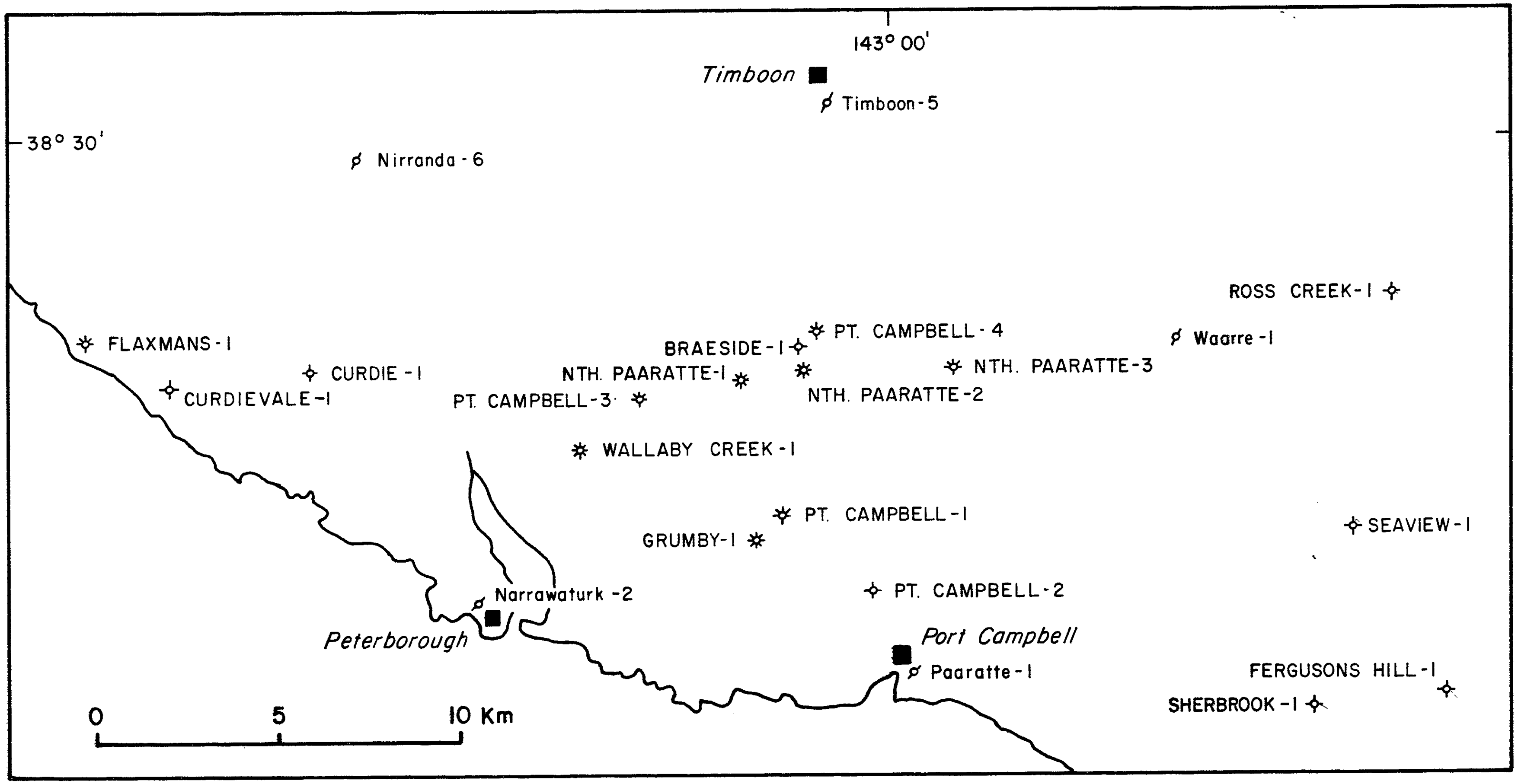


FIGURE 2

PARISH OF NIRRANDA

COUNTY OF HEYTESBURY

SCALE : 20 CHAINS = 1 INCH

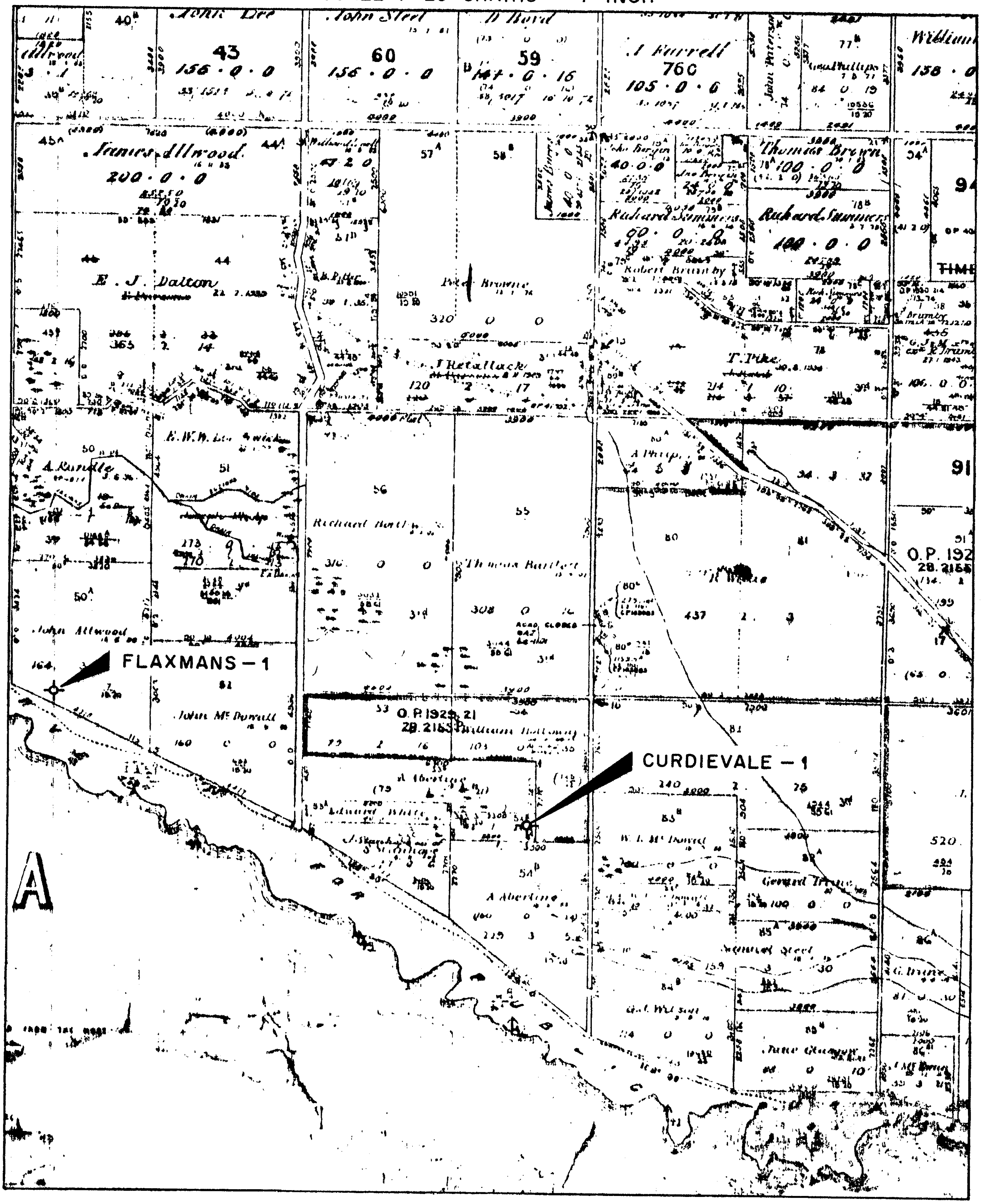


FIGURE 3

2. WELL HISTORY

2.1. Location (Refer Figure 2)

(i)	Co-ordinates (approx.)	:	38° 33' 23" South 142° 47' 04" East
(ii)	Geophysical Control	:	Shot Point 117 Line BC81-106 Beach Petroleum N.L. 1981 Boggy Creek Seismic Survey.
(iii)	Real Property Description	:	Parish of Nirranda Shire of Warrnambool County of Heytesbury
(iv)	Property Owner	:	Mr J Parsons 'Yaringa' Nirranda South 3268
(v)	District	:	Port Campbell Sheet 7420 100,000 Sheet.

2.2. General Data (Refer Figure 3)

(i)	Well Name and Number	:	Curdievale No. 1
(ii)	Tenement	:	P.E.P. 104
(iii)	Elevation	:	Ground Level - 52.4 m ASL Kelly Bushing- 58.4 m (All depths are referred to K.B.)
(iv)	Total Depth	:	Drill 1176 m Schlumberger 1175.5 m
(v)	Date Drilling Commenced	:	17/3/83 at 0500 hours
(vi)	Date Total Depth Reached	:	25/3/83 at 0335 hours
(vii)	Date Rig Released	:	27/3/83 at 0500 hours
(viii)	Drilling Time to Total Depth	:	8 days
(ix)	Status	:	Plugged and Abandoned.

2.3. Drilling Data

2.3.1.	Drilling Contractor	:	Petroleum Drilling Services Pty. Ltd. 5 Westcombe Street Darra Qld 4076
2.3.2.	Drilling Rig	:	Kremco 750 Rig No. 1 Details of the drilling plant are included in Appendix No. 2.

.../

2. WELL HISTORY - Continued

2.3. Drilling Data - Continued

2.3.3. Casing and Cementing Details

(i) Plugs

Plug No. 1

Interval	:	930 to 850 m (80 m)
Cement	:	105 Sacks Class 'G' Neat
Method	:	Balanced
Tested	:	No

Plug No. 2

Interval	:	520 to 440 m (80 m)
Cement	:	123 Sacks Class 'G' Neat
Method	:	Balanced
Tested	:	No

Plug No. 3

Interval	:	300 to 220 m (80 m)
Cement	:	104 Sacks Class 'G' plus 1% $CaCl_2$.
Method	:	Open ended drill pipe
Tested	:	Yes. Pressure tested to 1000 psi.

Plug No. 4

Interval	:	Surface
Cement	:	20 Sacks Class 'G'
Method	:	Handmixed with a metal cap fitted to the wellhead
Tested	:	Seen.

(ii) Conductor

A 20" conductor was set at 3.6 m.

.../

2. WELL HISTORY - Continued

2.3. Drilling Data - Continued

2.3.3. Casing and Cementing Details

(iii) Surface Casing

Size	:	9-5/8 inch
Weight	:	36 lbs/ft.
Grade	:	J55
Range	:	3
Coupling	:	STC
Centraliser	:	At 245 m, 256 m, 268 m, 279 m, 289 m.
Float Collar	:	At 280 m
Shoe	:	At 292 m
Cement	:	480 Sacks Class 'G' Neat
Cemented to	:	Surface
Method	:	Dual (Top + Bottom) plug displacement.
Equipment	:	Halliburton truck-mounted pump.

2.3.4. Drilling Fluid

(i) 12-¼" Hole, 0-297 m

The well was spudded using a fresh water gel mud with a funnel viscosity of 35 secs/qt. The range of properties:-

SG	:	1.03
Viscosity	:	35
Water Loss	:	Not Taken

(ii) 8-½" Hole, 297-1176 m (TD)

The 8-½" hole section was drilled using a lightly treated low solids, non-dispersed gel/Ben-Ex/CMC EHV system. Minor 'mud ring' problems occurred. Viscosity was maintained when drilling through the Dilwyn Formation. In addition the sump was constructed with a dividing wall in order that the drilling mud, from which formation

.../

2. WELL HISTORY - Continued

2.3. Drilling Data - Continued

2.3.4. Drilling Fluid - Continued

cuttings had been segregated, could be returned to the active mud system. The adoption of this set-up led to reduced water carting requisites and clean-up costs.

The range of properties:-

SG	:	1.03-1.08
Viscosity	:	35-48 secs
Water Loss	:	8-25

2.3.5. Water Supply

Drilling water was obtained from the Peterborough Town Bore and carted to the wellsite, a distance of approximately 14.5 km.

2.4. Formation Sampling and Testing

2.4.1. Cuttings

Lagged samples of cuttings were collected from the shale shaker at the following intervals:-

Surface	to	20 m	- Nil
30 m	to	300 m	- at 10 m frequency
300 m	to	1176 m	- at 5 m frequency

Four splits were made of the washed, oven-dried samples and stored in labelled polythene bags: one for Beach Petroleum N.L., one for Gas and Fuel Exploration N.L., one for Victorian Department of Minerals and Energy and one spare. One set of unwashed, air-dried samples was taken at 10 m intervals in calico bags for micropalaeo/palynology/source rock studies at a later date.

.../

2. WELL HISTORY - Continued

2.4. Formation Sampling and Testing - Continued

2.4.2. Cores

(i) Conventional

No cores were taken.

(ii) Sidewall

No sidewall cores were taken.

2.4.3. Tests

(i) Conventional

Drill Stem Test No. 1 (Refer to Appendix 1)

Interval Tested	:	936-965 m
Formation Tested	:	Pebble Point Formation
Packer Set at	:	936 m and 934 m
Valve Open (1)	:	45 minutes - after a strong initial blow the well died.
Final Shut-In (1)	:	45 minutes
Pressures (PSI) (Bottom gauge at 964 m)	:	Initial Hydrostatic 1446.5 Initial Flow (1) 1153.4 Final Flow (1) 1323.3 Final Shut-In (1) 1323.3 Final Hydrostatic 1446.7 (BHT = 51.5°C at 964 m)
Recovery	:	891 m of formation water (200 ppm Chlorides)
Assessment	:	The Pebble Point Formation has good permeability and is saturated with fresh formation water.

2.5. Logging and Surveys

2.5.1. Mud Logging

A skid-mounted Exploration Logging (EXLOG) unit was used to provide penetration rate, continuous mud gas monitoring, intermittent mud and cuttings gas analyses, pump rate and mud volume data and cuttings descriptions.

The Mud Log is enclosed as Enclosure 1.

.../

2. WELL HISTORY - Continued

2.5. Logging and Surveys - Continued

2.5.2. Wireline Logging

Schlumberger recorded the following logs in open hole.

Run 1

Dual Laterolog (DLL-SP-GR-CAL)

DLL-SP-GR-CAL 291.5 m (9-5/8" Casing Shoe) - 1175.5 m (TD)

Sonic Log (BHC)

291.5 m (9-5/8" Casing Shoe) - 1175.5 m(T.D.)

Density Neutron Log (FDC-CNL-GR-CAL)

525 m - 1175.5 (T.D.)

These logs are included as Enclosures 3 to 5.

2.5.3. Deviation Surveys

The results of deviation surveys using a TOTCO survey instrument were:-

0^o	@	40 m
$\frac{1}{2}^o$	@	97 m
Misrun	@	61 m
0^o	@	151 m
$3/4^o$	@	217 m
$3/4^o$	@	291 m
$\frac{1}{2}^o$	@	401 m
$\frac{1}{4}^o$	@	496 m
0^o	@	611 m
0^o	@	705 m
$3/4^o$	@	887 m
3^o	@	964 m

2.5.4. Velocity Survey

No Velocity Survey was carried out.

3. RESULTS OF DRILLING -

3.1. Stratigraphy

The following formation tops have been picked using cuttings' descriptions, mudlog and wireline log data (all depths in metres).

Group	Formation	KB(m)	Subsea(m)	Thickness(m)
Heytesbury	Port Campbell	Surface	+ 52.4	110 +
	Gellibrand	116	- 57.6	345
	Clifton	461	- 402.6	8
Nirranda	Narrawaturk	469	- 410.6	66
	Mepunga	535	- 476.6	31
Wangerrip	Dilwyn	566	- 507.6	314
	(Pember Mudstone Member)	880	- 821.6	47
	Pebble Point	927	- 868.6	88
Sherbrook	Paaratte	1015	- 956.6	161 +
	T.D.	1176	-1117.6	

(i) The Gellibrand Marl formation top was defined on the basis of sample cuttings alone. The remaining formation tops were defined using cuttings descriptions in conjunction with wireline log data.

3.2. Lithologic Description

Formation	Lithologic Description
HEYTESBURY GROUP	
Port Campbell Formation	Surface - 116 m
	10-116 m
	CALCARENITE, pale yellow orange, hard, becoming very light grey from 40 m, fine grained, sub-rounded quartz grains, moderate medium grey argillaceous matrix, trace fossil fragments; echinoid spines, forams, bryozoans, shelly fragments, trace glauconite; greyish green, medium grain size, trace coal debris; black, firm, earthy, rare pyrite.

.../

3. RESULTS OF DRILLING - Continued

3.2. Lithologic Description - Continued

Formation	Lithologic Description
Gellibrand Formation	116 - 461 m MARL light grey becoming medium green grey, medium olive grey with depth, very soft, sticky, commonly fossiliferous; forams, shell fragments, gasteropods, sponge spicules, trace pyrite, trace glauconite.
Clifton Formation	461 - 469 m CALCARENITE dark yellowish orange, friable to hard, very coarse, common dark brown iron oxide concretions; friable, well rounded, abundant fossil content; forams, corals, bryozoans, common iron staining.
NIRRANDA SUB-GROUP	
Narrawaturk Formation	469 - 535 m MARL, medium brown to medium olive green grey, soft, dispersive, common to abundant well fragmented fossils; dominantly bryozoans and gasteropods, dark grey green glauconite decreasing with depth.
Mepunga Formation	535 - 566 m 535 - 545.5 m CALCARENITE, off white to very pale orange, very hard, cryptocrystalline, occasional dark green lithic fragments, calcareous matrix, commonly fossiliferous. 545.5 - 566 m MARL, light grey to yellow brown, soft, dispersive, commonly fossiliferous decreasing with depth, trace pyrite, minor glauconite;hard, well rounded becoming abundant with depth.
WANGERRIP GROUP	
Dilwyn Formation	566 - 880 m 566 - approx. 604 m SANDSTONE, clear to dark yellowish orange, loose, fine to very coarse, dominantly medium, subrounded to rounded quartz grains, dominantly subrounded, poor sorting, fine dispersive silt matrix, weak calcite cement, common dark brown staining, common glauconite, trace pyrite, moderate visual porosity interbedded with, SILTSTONE, medium grey, brown grey, dark grey, soft to firm, dispersive in part, arenaceous in part, occasional fine dark green lithics, rare pyrite,

.../

3. RESULTS OF DRILLING - Continued

3.2. Lithologic Description - Continued

Formation	Lithologic Description
Dilwyn Formation (Continued)	approx. 604 - 880 m SANDSTONE clear to very light grey, loose, medium to very coarse dominantly coarse, increase in fine fraction with depth, subangular to subrounded, dominantly subrounded but angularity increases slightly with depth, moderately sorted becoming poor with depth, minor silt matrix, trace pyrite cement, trace calcite cement, good visible porosity. No fluorescence. Interbedded with SILTSTONE, dusky brown green grey, soft, very dispersive, argillaceous content increases with depth, sub fissile in part, very calcareous in part, trace COAL black, brittle, sub conchoidal fracture, shiny, minor glauconite, common fossil fragments.
Pember Mudstone Member	880 - 927 m SILTY CLAYSTONE, medium to dark grey, soft, very dispersive, partly very finely arenaceous, finely carbonaceous in part, trace pyrite, abundant glauconite pellets; dark grey green, soft, fine grain, well rounded, minor fine to very coarse dominantly coarse, subrounded poorly sorted quartz grains. Note: due to the claystone's dispersive quality falsely high sand fractions are yielded in its shale shaker samples.
Pebble Point Formation	927 - 1015 m 927 - 941 m SANDSTONE, white, clear, yellow brown, loose to friable, medium to coarse, dominantly coarse, moderately sorted, subangular to subrounded, abundant dark brown matrix, trace iron oxide pellets, trace pyrite, trace glauconite, common dark brown iron oxide staining, poor visible porosity. No Fluorescence. 941 - 1015 m SANDSTONE, clear to light brown, loose to friable, medium to very coarse, dominantly medium, subangular to subrounded quartz, well sorted, some dispersive silt matrix, trace pyrite cement, good visible porosity. No Fluorescence.

.../

3. RESULTS OF DRILLING - Continued

3.2. Lithologic Description - Continued

Formation	Lithologic Description
Paaratte Formation	1015 - 1176 m (T.D.) SILTSTONE, dark grey, soft to friable, dispersive in part, arenaceous in part interbedded and interlaminated with SANDSTONE, clear light brown, loose, medium to very coarse, dominantly coarse grained, subangular to subrounded moderately well sorted, trace pyrite cement, common dispersed silt matrix, occasional light to medium grey lithics, moderate visual porosity. No Fluorescence.

4. GEOLOGY

4.1. Structure - Conclusions

4.1.1. Structure

The Curdievale-1 structure at the Pebble Point level can be recognised on seismic as an anticlinal ridge running approximately ENE-WSW. Due to the disharmonic structural style of the Otway Basin this feature at this level had not been previously tested by either of the two nearest wells (Flaxmans-1, Curdie-1), in both of which hydrocarbon shows had been reported in the Pebble Point Formation.

Prediction of the formation depths concurred closely with the formation depths actually encountered. (See Figure 4). The Pebble Point Formation top confirmed the well's crestal location relative to Flaxmans-1 and Curdie-1 (see Table 1).

There is a jump correlation required between an old (1963), lagged, offshore dynamite line and a new (1981), unlagged, onshore vibroseis seismic survey. Precise interpretation of the offshore dip of the anticlinal ridge and position of Curdievale-1 relative to the highest point of the ridge is therefore unresolved. The absence of hydrocarbons has downgraded the structure whatever the dip of the anticlinal axis may be.

4.1.2. Age of Structure

The Curdievale anticlinal feature is relatively young.

Only very minor thinning relative to its overall thickness (see Table 1) is observed in the Dilwyn Formation at the Curdievale-1 location. The small difference in thickness of the Dilwyn Formation compared with that at Curdie-1 and Flaxmans-1 may be explained by thinning of the crest during later folding.

.../

Deposition of the Clifton Formation was both brief in geological time, and widespread. The lateral continuity of the Clifton Formation between Flaxmans-1 and Curdie-1 indicates that a pre-existing high with significant rollover was not present at Curdievale-1 at the time.

Folding probably occurred in association with the Koscuisko Uplift and the extensive Newer Volcanics basalt flows that culminated in the Pliocene. Therefore the age of the structure must be dated as post Clifton Formation and middle Miocene to late Pliocene.

Alternatively the extent and location of the major Curdievale fold could be explained by diapiric action of the thick Belfast Mudstones as found in the Curdie Trough. This explanation although unconfirmed is suggested by:-

(a) Seismic sections below the Upper Paaratte Formation and close to the crest of the feature often lose character across distinct areas.

(b) The structure as mapped does not appear to cross the Boggy Creek Fault.

(c) The structure tends to fade over the Pecten High area where the Belfast Formation thins.

Initiation of the diapiric activity could be movement associated with the Koscuisko uplift.

COMPARISON OF FORMATION TOPS AT FLAXMANS NO. 1
CURDIEVALE NO. 1 AND CURDIE NO. 1

FORMATION NAME	SUBSEA DEPTHS (THICKNESS) IN METRES		
	Flaxmans No. 1	Curdievale No. 1	Curdie No. 1
Port Campbell	+ 68 (158)	+ 52.4 (110)	+ 35.8 (119)
Gellibrand	- 90 (353)	- 57.6 (345)	- 83.2 (346)
Clifton	- 443 (13)	- 402.6 (8)	- 429.2 (15)
Narrawaturk	- 456 (59)	- 410.6 (66)	- 444.2 (77)
Mepunga	- 515 (27)	- 476.6 (31)	- 521.2 (31)
Dilwyn	- 542 (326)	- 507.6 (314)	- 552.2 (332)
Pember Mudstone Member	- 868 (34)	- 821.6 (47)	- 884.2 (68)
Pebble Point	- 902 (99)	- 868.6 (88)	- 952.2 (998)
Paaratte	-1001	- 956.6	-1052
T.D.	-3445	-1117.6	-2557.2

TABLE 1

CURDIEVALE No.1

FORMATION TOPS

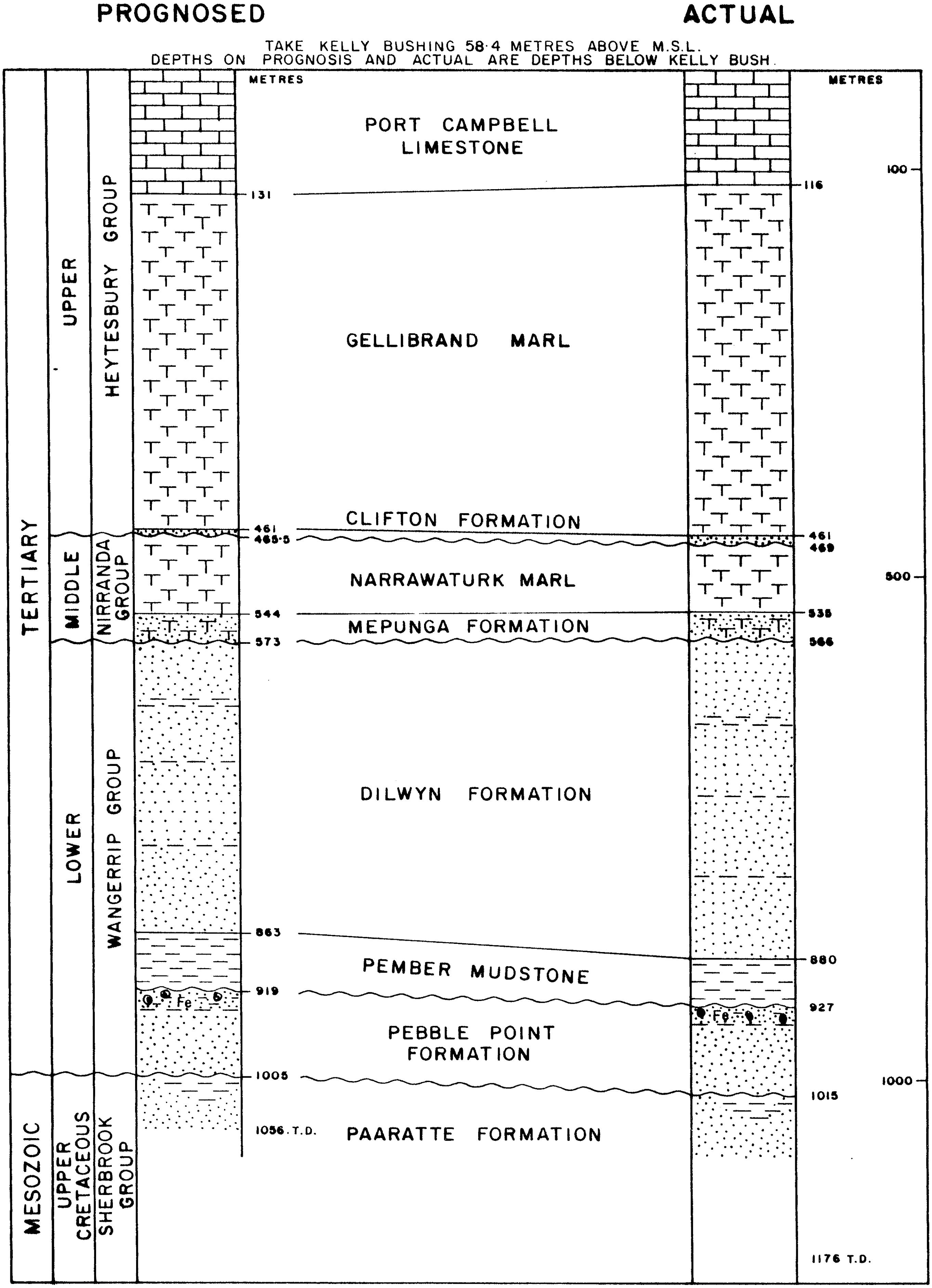


FIGURE No.4

DRG No.1920

4. GEOLOGY - Continued

4.2. Porosity/Water Salinity/Saturation

Dilwyn Formation

(i) Porosity

Average porosity in the sandstone units of the interbedded sandstone/siltstone sequences is 31%. This figure is wireline log derived using a Density-Neutron crossplot and includes a shale correction. See Appendix 5.

(ii) Water Salinity/Saturation

Water saturation was calculated using Rw = 1.7 Ω @ 41°C from - 30 MV SP at 625 m. Log interpretation confirms that Sw = 100% for the Dilwyn Formation.

Pebble Point Formation

(i) Porosity

Log interpretation indicates the average porosity to be at 22%. This effective porosity was obtained from the Density-Neutron crossplot using a shale correction.

(ii) Water Salinity/Saturation

The salinity of formation water recovered from the middle section (in preference to the contaminated bottom sample) of a drill stem test is 540 ppm. An Rw = 5.6 Ω @ 53°C was used to determine the water saturation. Sw = 100% for the Pebble Point Formation. See Appendix 5.

Paaratte Formation

(i) Porosity

The average porosity obtained by wireline log interpretation of several zones between 1047-1150 m. is 26%.

(ii) Water Salinity/Saturation

The same Rw = 5.6 Ω @ 53°C was used to determine Sw. Water saturation for the Paaratte Formation is 100%. See Appendix 5.

.../

4. GEOLOGY - Continued

4.3 Occurrence of Hydrocarbons/Source Rock-Maturation

(i) Dilwyn Formation

No hydrocarbon fluorescence was observed. Total gas was recorded with a range of 60-100 ppm of C_1 only. Wireline log interpretation confirmed the lack of hydrocarbons. (See Appendix No. 5).

(ii) Pebble Point Formation

No hydrocarbon fluorescence was observed. Total gas was recorded with a range of 200-800 ppm consisting of a maximum of 700 ppm C_1 with a trace 30 ppm C_2 and 5 ppm C_3.

A drill stem test between 936-965 m recovered 891 m of fresh formation water with a salinity of 540 ppm. There were no indications of hydrocarbons during the test. See Appendix No. 1.

Wireline log interpretation confirmed the lack of hydrocarbons. See Appendix No. 5.

(iii) Paaratte Formation

No hydrocarbon flourescence was observed. Total gas was recorded with a range of 40-150 ppm C_1 only. Wireline log interpretation confirmed the lack of hydrocarbons. See Appendix No. 5.

Source Rock-Maturation

Results of samples submitted from the Curdie No. 1 well indicate that maturation is not achieved in this area until the Eumeralla Formation is penetrated. Therefore, no samples have been submitted for geochemical studies.

4.4 Contributions to Geology

1. The expected seal potential of the Pember Mudstone Member augmented by a 14 m cemented lateritic zone at Top Pebble Point Formation was re-affirmed.

.../

4. GEOLOGY - Continued

4.4 Contributions to Geology - Continued

2. Although Curdievale-1 was verified as a crestal test its precise position along the anticlinal ridge remains undefined. The absence of hydrocarbons in the structure suggests that the inferred south-west plunge of the anticlinal axis cannot be confirmed given limited seismic data in that area.

3. Correlation of the wireline logs between Curdievale-1 and Curdie-1 is good with one exception. The base of the laterite zone appeared to lack the full development as was observed at Curdie-1, possibly as a result of a sudden relative fall in the water table which in turn truncated the laterite - enrichment process. The porosity of the Pebble Point sands at 22% (log derived) decreases abruptly at the interface of the cemented lateritic sands at near top Pebble Point Formation in the Curdievale-1 well. Hydrocarbons may have been more efficiently replaced by groundwater at this location than at Curdie-1 where a transitional interface between porous and tight sands helped to retain residual oil traces.

4.5 Drilling Results - Reasons

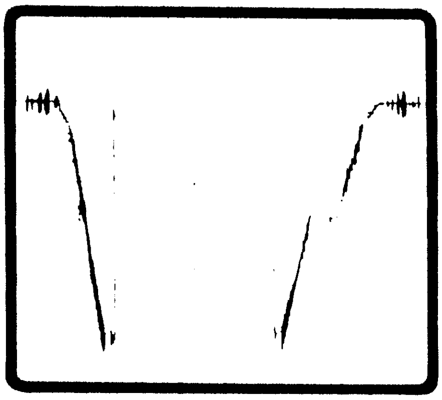
Since all horizons were penetrated where predicted it is assumed that the seismic interpretation prior to drilling was correct and that the well was located in a crestal position on the Curdievale anticline.

The lack of hydrocarbons in the Pebble Point Formation can therefore only be attributed to flushing by meteoric waters within the Pebble Point Formations.

APPENDIX NO. 1

DRILL STEM TEST RESULTS

FORMATION TESTING SERVICE REPORT



HALLIBURTON
SERVICES

Duncan, Oklahoma 73536
A Halliburton Company

1296-R4 Ⓛ—Southwestern

NOMENCLATURE

B	— Formation Volume Factor (Res Vol / Std Vol)	——
c_t	— System Total Compressibility	(Vol / Vol) / psi
DR	— Damage Ratio	——
h	— Estimated Net Pay Thickness	Ft
k	— Permeability	md
m	(Liquid) Slope Extrapolated Pressure Plot	psi/cycle
	(Gas) Slope Extrapolated m(P) Plot	MM psi²/cp/cycle
$m(P^*)$	Real Gas Potential at P*	MM psi²/cp
$m(P_f)$	Real Gas Potential at P_f	MM psi²/cp
AOF_1	Maximum Indicated Absolute Open Flow at Test Conditions	MCFD
AOF_2	Minimum Indicated Absolute Open Flow at Test Conditions	MCFD
P^*	Extrapolated Static Pressure	Psig
P_f	Final Flow Pressure	Psig
Q	— Liquid Production Rate During Test	BPD
Q_1	Theoretical Liquid Production w/ Damage Removed	BPD
Q_g	— Measured Gas Production Rate	MCFD
r_i	Approximate Radius of Investigation	Ft
r_w	Radius of Well Bore	Ft
S	Skin Factor	
t	Total Flow Time Previous to Closed-in	Minutes
Δt	Closed-in Time at Data Point	Minutes
T	Temperature Rankine	R
ϕ	Porosity	——
μ	Viscosity of Gas or Liquid	cp
Log	Common Log	

HALLIBURTON

SERVICES

TICKET NO. 20267900

12-APR-83

ADELAIDE

FORMATION TESTING SERVICE REPORT

CURDIVALE
LEASE NAME

1
WELL NO.

1
TEST NO.

3070.' - 3106.'
TESTED INTERVAL

BEACH PETROLEUM N.L.
LEASE OWNER/COMPANY NAME

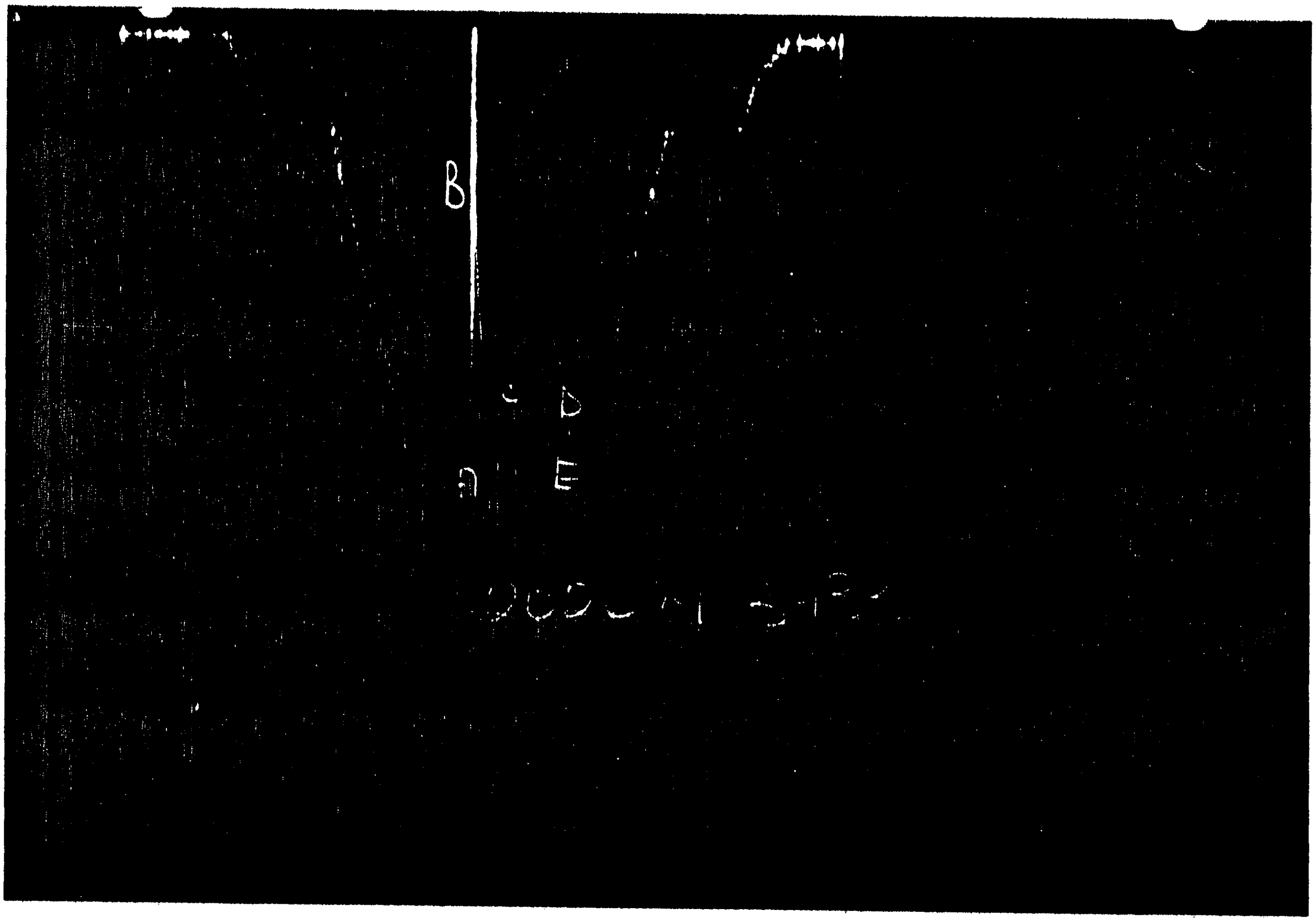
LEGAL LOCATION SEC. - TWP. - RNG.
SEE REMARKS

FIELD AREA
OTWAY BASIN

COUNTY
WEST VICTORIA

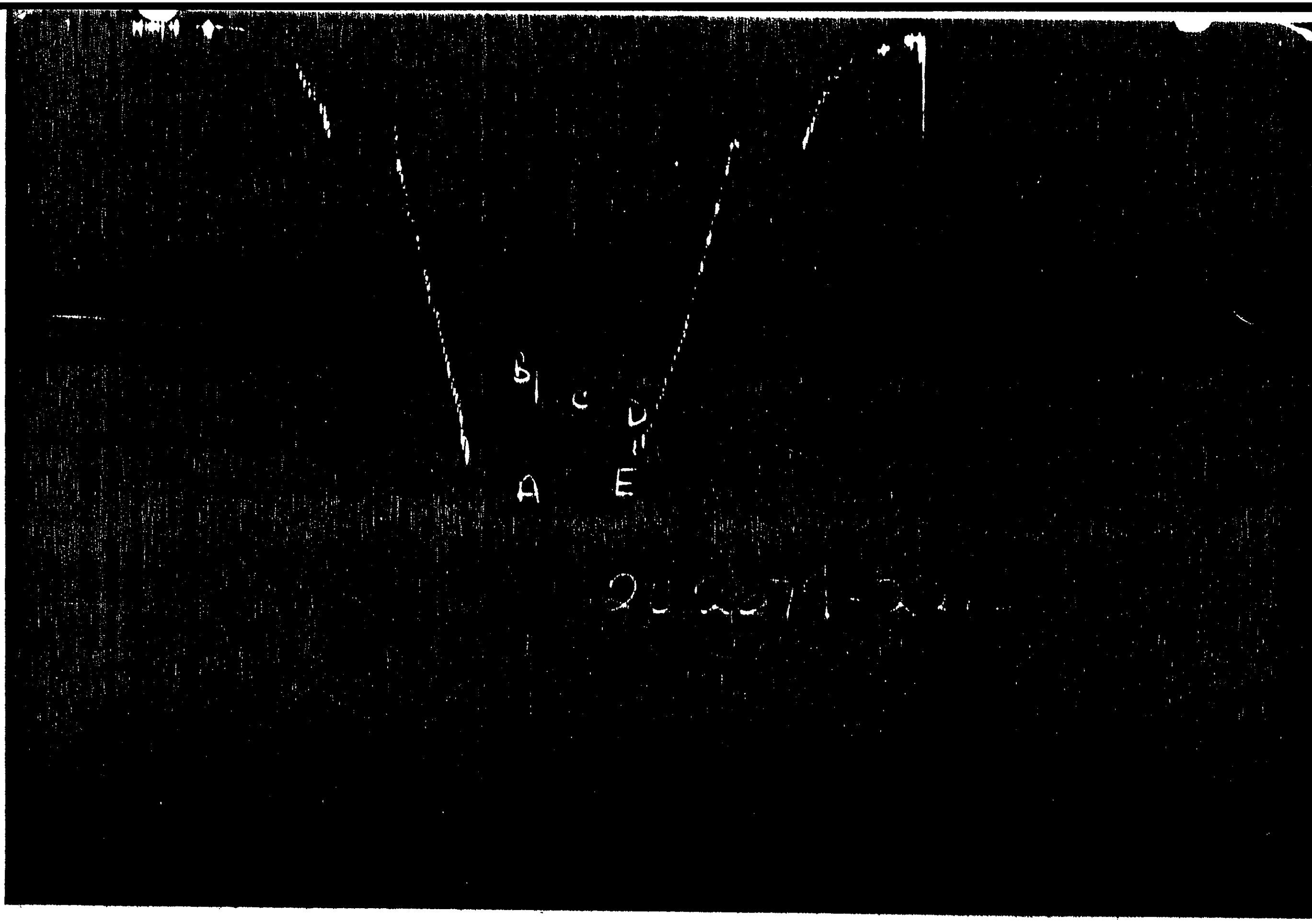
STATE
AUSTRALIA

P/J



GAUGE NO: 3933 DEPTH: 3050.1 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC	1384	1393.6			
B	INITIAL FIRST FLOW	65	668.1	45.0	45.0	F
C	FINAL FIRST FLOW	1267	1273.2			
C	INITIAL FIRST CLOSED-IN	1267	1273.2	51.0	51.0	C
D	FINAL FIRST CLOSED IN	1260	1273.2			
E	FINAL HYDROSTATIC	1384	1393.6			



GAUGE NO: 2270 DEPTH: 3161.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC	1436	1446.7			
B	INITIAL FIRST FLOW	1132	1153.4	45.0	45.0	F
C	FINAL FIRST FLOW	1311	1323.3			
C	INITIAL FIRST CLOSED IN	1311	1323.3	51.0	51.0	C
D	FINAL FIRST CLOSED IN	[illegible]	1323.2			
E	FINAL HYDROSTATIC	[illegible]	1446.7			

EQUIPMENT & HOLE DATA

FORMATION TESTED: PEBBLE POINT
NET PAY (ft):
GROSS TESTED FOOTAGE: 96.0
ALL DEPTHS MEASURED FROM: R. KELLY BUSHING
CASING PERFS. (ft):
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 193
TOTAL DEPTH (ft): 3166.0
PACKER DEPTH(S) (ft): 3064, 3070
FINAL SURFACE CHOKE (in): 0.500
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.00
MUD VISCOSITY (sec):
ESTIMATED HOLE TEMP. (°F):
ACTUAL HOLE TEMP. (°F): 124 @ 3162.5 ft

TICKET NUMBER: 20267900

DATE: 3-24-83 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: ADELAIDE

TESTER: M. JENKINS
C. HUON

WITNESS: GARY SCOTT

DRILLING CONTRACTOR: P.D.S.A. DRILLING

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm

SAMPLER DATA

Psig AT SURFACE:
cu.ft. OF GAS:
cc OF OIL:
cc OF WATER:
cc OF MUD:
TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F
GAS/OIL RATIO (cu.ft. per bbl):
GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT

RECOVERED:

2923.6 FEET OF WATER ABOVE TESTER....

MEASURED FROM

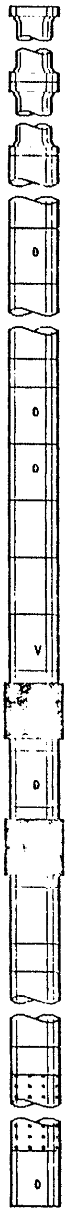
REMARKS:

LEGAL LOCATION: LATITUDE 38 DEGREES 33 MINUTES AND 19 SECONDS.
LONGITUDE 142 DEGREES 47 MINUTES AND 02 SECONDS.

TYPE & SIZE MEASURING DEVICE:	POSITIVE CHOKE NIPPLE	TICKET NO: 20267900

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
3-23-83					
2230					STARTED PICKING UP ANCHOR PIPE
					LOGGED STYLUS ON BT #2270.
2335					LOGGED STYLUS ON BT #3933.
3-24-83					
0100					TOOLS THRU ROTARY TABLE.
0530					RIGGED UP HEAD AND SURFACE
					EQUIPMENT. WAITED ON DAYLIGHT.
0630					STRING WEIGHT = 65,000#. HOLE
					FULL.
0634					SET ON BOTTOM WITH 26,000#.
0636	.50				OPENED TOOL.
0638	.50				BUBBLES BEGAN AND INCREASED TO
					A STRONG BLOW.
0640	.50				STRONG BLOW CONTINUED.
0642	.50				DECREASED TO A MEDIUM HEAVY
					BLOW.
0644	.50				DECREASED TO A LIGHT BLOW.
0646	.50				LIGHT BLOW.
0648	.50				WEAK BLOW.
0650	.50				VERY WEAK BLOW.
0655	.50				VERY WEAK BLOW.
0700	.50				NO BLOW AT TOP OF BUCKET.
0704	BH				CLOSED IN MANIFOLD-WEAK BLOW
					THROUGH BUBBLE HOSE.
0721					CLOSED TOOL.
0812					BYPASSED AND TERMINATED TEST.
0830					PULLED OUT OF HOLE.
0900					RECOVERED WATER - 120 FEET FROM
					SURFACE.
1045					PICKED UP AND BROKE DOWN HEAD.
1100					RIGGED DOWN FOR REPAIRS.
1200					CONTINUED PULLING OUT OF HOLE.
1300					TOOLS TO SURFACE.
					BH - BUBBLE HOSE

TICKET NO. 20267900



		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE	4.500	3.826	2372.6	
4	FLEX WEIGHT	4.500	2.750	303.4	
3	DRILL COLLARS	6.500	2.500	303.2	
50	IMPACT REVERSING SUB	6.000	3.000	1.0	2975.7
3	DRILL COLLARS	6.500	2.500	61.9	
5	CROSSOVER	6.500	2.375	0.7	
12	DUAL CIP VALVE	5.000	0.875	4.9	
60	HYDROSPRING TESTER	5.000	0.750	5.3	3047.9
80	AP RUNNING CASE	5.000	2.250	4.1	3050.1
15	JAR	5.000	1.750	5.0	
16	VR SAFETY JOINT	5.000	1.000	2.8	
70	OPEN HOLE PACKER	7.500	1.527	5.8	3062.0
18	DISTRIBUTOR VALVE	5.000	1.[illegible]3	2.0	
70	OPEN HOLE PACKER	7.500	1.5[illegible]	5.8	3070.0
19	ANCHOR PIPE SAFETY JOINT	5.000	1.500	4.3	
5	CROSSOVER	5.750	2.437	0.7	
3	DRILL COLLARS	6.500	2.500	60.5	
5	CROSSOVER	5.750	2.437	1.0	
20	FLUSH JOINT ANCHOR	5.000	2.375	23.0	
81	BLANKED-OFF RUNNING CASE	5.000		4.1	3163.0
	TOTAL DEPTH				3166.0

EQUIPMENT DATA

EQUATIONS FOR DST LIQUID WELL ANALYSIS

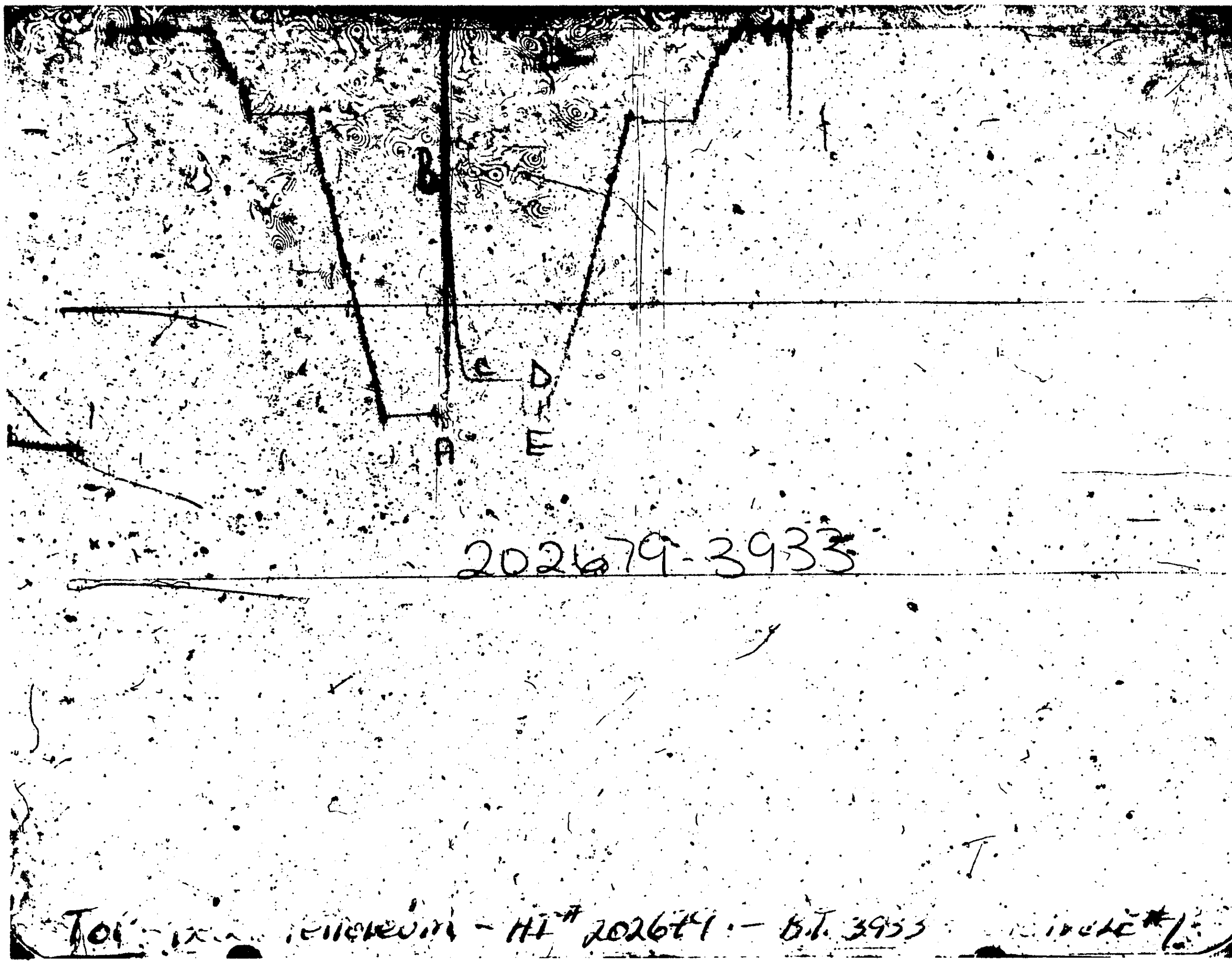
Transmissibility	$\frac{kh}{\mu} = \frac{162.6\,QB}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu}\,\mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Damage Ratio	$DR = .183\,\frac{P^* - P_f}{m}$	—
Theoretical Potential w / Damage Removed	$Q_t = Q\,DR$	BPD
Approx. Radius of Investigation	$r_i = 4.63\sqrt{kt}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637\,Q_g\,T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151\left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG}\,\frac{kt}{\phi\,\mu\,c_t r_w^2} + 3.23\right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87\,mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g\,m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g\sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032\sqrt{\frac{kt}{\phi\mu c_t}}$	ft

GAUGE NO: 2270 DEPTH: 3163.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	1436	1446.7			
B	INITIAL FIRST FLOW	1132	1153.4	45.0	45.0	F
C	FINAL FIRST FLOW	1311	1323.3			
C	INITIAL FIRST CLOSED-IN	1311	1323.3	51.0	51.0	C
D	FINAL FIRST CLOSED-IN	1316	1323.2			
E	FINAL HYDROSTATIC	1436	1446.7			



GAUGE NO: 3933 DEPTH: 3050.1 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	1384	1393.6			
B	INITIAL FIRST FLOW	65	668.1	45.0	45.0	F
C	FINAL FIRST FLOW	1267	1273.2			
C	INITIAL FIRST CLOSED-IN	1267	1273.2	51.0	51.0	C
D	FINAL FIRST CLOSED-IN	1260	1273.2			
E	FINAL HYDROSTATIC	1382	1393.6			

APPENDIX NO. 2

DETAILS OF DRILLING PLANT

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

Contractor's Rig No.: P.D.S.A. RIG 1

awworks: KREMCO K 750T DOUBLE DRUM 860 HP. MAX. RATING

mpound: SUPERIOR

gines: 2 x CAT. 3406 PTCA.

Rotary Table: GARDNER DENVER 17½" INCH.

bstructure: HEIGHT - 18FT. WIDTH 12FT. LENGTH 15FT. OVERHALL SKID LENGTH 34FT. WIDTH OF LOOR IN WORKING POSITION 16FT. A.P.I. RATING 350,000LBS. WITH A 280,000LBS SET BACK.

Rig Lighting: EXPLOSION PROOF, FLOOD AND FLUORESCENT LIGHTS, MAST FITTED WITH AIRCRAFT W/LIGHT.

ast KREMCO 112FT CLEAR WORKING HEIGHT, HYDRAULICALLY RAISING AND TELESCOPING. ACKING BOARD AUTOMATICALLY ERECTING TYPE. CAPACITY 8,000FT OF 4½" INCH DRILL PIPE IN DOUBLES MOUNTED 55 FT FROM GROUND.

own Block: 1-36 INCH FAST LINE SHEAVE 4-30 INCH CROWN SHEAVE 1-20 INCH SANDLINE SHEAVE.

avelling Block: 150 TON McKISSICK WITH WEBB WILSON 150 TON HOOK.

Swivel: 150 TON TRISERVICE MACHINE.

lly Drive:

ud Pumps: 2- OILWELL MODEL PT. 600 7 INCH X 8 INCH SINGLE ACTING.

ixing Pump: WARMAN 6 INCH x 4 INCH 50 HP.

ud Agitator: 4- PIONEER 40 TD-15 "PIT BULL" WITH 15HP. ELECTRIC MOTORS

ud Tanks: 1-300 BARRELS CAPACITY 1-220 BARREL CAPACITY.

Shale Shakers: 1-BRANDT DUAL TANDEM.

sander: 1-PIONEER T8 - 6

silter: 1-PIONEER T12- 4

Degasser: 1-DRILCO ATMOSPHERIC

enerators: 2-CAT. 3408 TA 230 KW. EACH.

OP's and Accumulator: ANNULAR HYDRIL TYPE GK. 13 5/8 3,000lbs.
RAM TYPE HYDRIL DOUBLE 13 5/8 5,000lbs.
WAGNER 160 GALLON CAPACITY.

lly Cock: HYDRIL 7 3/4 INCH 6 3/8 REG LH.

Drill Pipe Safety Valve: HYDRIL 6 5/8 4½ XH RH HYDRIL STABBING VALVE

ir Compressors & Receivers: 2 - ATLAS COPCO TYPE GA-208

ools 1 - 13 5/8 SERIES 1500 (BX - 160) x 12 INCH SERIES 9000(R-57) WITH 1x3" 1x2" OUTLET.
1 - 13 5/8 SERIES 1500 (BX - 160) x 10 INCH SERIES 9000(R-53) WITH 1x3" 1x2" OUTLET.

Cup Tester 1- CAMERON

athole Driller: YES.

hoke Manifold: WKM 5000 PSI. TO A.P.I. STANDARD WITH 1 MANUAL 1 SWACO SUPER CHOKE

Drill Pipe: 8,000FT 4½ INCH GRADE E 16.6. LBS/FT.
300FT 4½ INCH HEAVY WEIGHT

ill Collars 22 ~~20~~ - 6½ WITH 4½ INCH XH CONNECTIONS
6 - 8 WITH 4½ INCH XH CONNECTIONS

ock Subs

elly: 4½ SQUARE x 2½" I.D. 40' LONG

Core Barrels

Stabilizers: DRILCO 8½ INCH O.D.

Fishing Tools: 8½ INCH BOWEN SERIES 150 OVERSHOT
CATCH SIZES 6-½", 6-3/8", 6½", 6", 4½"
BOWEN 8" JUNK SUB BOWEN 6½" JUNK SUB.
BOWEN 8-1/8" JUNK BASKET
BOWEN 6-½" HYDRAULIC JAR

Handling Tools: CASING ELEVATORS 150 TON, BJ, 9-5/8, 7", 5½". SINGLE CASING JOINT PICKUP. ELEVATORS BJ. TYPE SJ, 13 5/8, 9 5/8,7", VARCO CASING CLAMPS MODEL M.P.R. 5½, 13 5/8 250 TON VARCO DRILL PIPE ELEVATORS 6½" 8" DRILL COLLAR ZIP LIFT ELEVATORS CASING SLIPS, VARCO OMS-XL 13 5/8, 9 5/8, 7". VARCO S.D.M.L. 5½" TUBULAR SLIPS VARCO S.D.M.L. 4", 3½", 2 7/8", 2 3/8". DRILL COLLAR SLIPS VARCO DCS-R, DCS-L 6½" 8". FARR POWER TONGS 13 5/8, 9 5/8, 7", 5½" CASING

Instruments and Indicators: GEOSOURCE 2 PEN MUD SENTRY.

Drilling Rate Recorder: GEOSOURCE 6 PEN SENTRY RECORDER.
Deviation Instrument: TOTCO 0 - 8°
Tool House: YES
Dog House: YES
Generator House: YES
Welding Equipment: YES
Pipe Racks: YES
Catwalks: YES
Water Tank: YES
Fuel Tank: YES
Substitutes:

Mud Testing: YES
Junk Box: YES
Rathole Driller: YES
Mud Saver: YES
Cellar Pump: YES
Matting: YES
Pipe Straightener: NO
Hydraulic Pump: YES
Water Pumps: YES
Fire Extinguishers: YES

4. (b) TRANSPORT EQUIPMENT AND MOTOR VEHICLES:
1 FORKLIFT OR POLE TRUCK
1 TOYOTA PICK UP TRUCK
1 TOYOTA 10 MAN TROOP CARRIER

4. (c) CAMP AND EQUIPMENT:
FULLY AIR CONDITIONED TOOLPUSHER COMPANY REPRESENTATIVE SHACK COMPLETE WITH COOKING, REFRIGERATION AND ABLUTION FACILITIES.

APPENDIX NO. 3

DRILLING FLUID RECAP

BEACH PETROLEUM

DRILLING FLUID RECAP FOR

CURDIEVALE #1

Prepared by: M. Olejniczak

April, 1983

TABLE OF CONTENTS

BAROID AUSTRALIA PTY. LIMITED

NL INDUSTRIES

WELL SUMMARY

Baroid Engineers: M. Olejniczak

Operator	:	Beach Petroleum
Well Number	:	Curdievale #1
Location	:	Peterborough, Victoria
Contractor	:	P.D.S.A.
Rig	:	#1
Total Depth	:	1176m
Water Depth/KB to Ocean Floor	:	Surface
Arrived on Location	:	14th March, 1983
Spud Date	:	16th March, 1983
* Date Reached T.D.	:	27th March, 1983
* Total Days Drilling	:	11
Date off Location	:	27th March, 1983
Total Days on Well	:	14
* Total Cost of Mud Materials	:	$A3,775.93
* Mud Costs/m	:	$A3.21
* Mud Costs/day	:	$A343.27
Engineer Service (14 days) @ $265.00	:	$A3,710.00
Total Cost Materials and Engineer Service	:	$A7,485.93
Mud Materials not Charged to Drilling	:	-
Engineer Service Not Charged to Drilling	:	-
Casing Program	:	9.5/8" Surface at 292m

* Calculated as from actual spud to P and A or final casing run and testing program started etc.

DISCUSSION BY INTERVAL (Cont.)

12¼" Hole - Surface to 297m

The well was spudded in on the 16th March, 1983, with water, in the hope that the light skeletal surface limestone could be drilled with water until the mud making Gellibrand Marl was reached so saving on materials consumption.

However, the conductor pipe washed out, with water returns entirely to the cellar, almost immediately after spudding in. Apparently the cementing of the conductor pipe had been inadequage. After unsuccessfully attempting to seal the conductor with AQUAGEL/BENEX slugs, the best part of the day was spent rigging up a functioning cellar jet so that returns could be pumped back from the cellar to the pits.

Finally resumed drilling on the morning of the 17th March, using an AQUAGEL/ BENEX spud mud, from 12m. Maintained a viscosity of about 35 secs. using AQUAGEL, until at 90m lost about 200 bbls mud to the sump when the cellar jet was not operating. To replace this, filled the tanks with water and used LIME for rapid viscosity without having to mix any AQUAGEL as the marl was expected soon.

As soon as began drilling marl at 116m, continued using only water, with additions of LIME for clay inhibition, and additions of CONDET and NUTPLUG to reduce hole stickiness. LIME additions were soon discontinued, however, as it became too difficult to control the rapid viscosity increases while adding LIME to the fresh water native clay mud.

AT 205m and 228m had minor mud rings which partially blocked the top of the bell nipple and flowline. These did not restrict downhole circulation, but

.../Cont.

DISCUSSION BY INTERVAL (Cont.)

12¼" Hole (Cont.)

caused returns to overflow the bell nipple into the cellar. They were cleared by working the pipe and washing with hoses in about an hour each. An unexpected bonus was that the mud rings sealed the base of the conductor so that normal circulation through the flowline was resumed.

Continued drilling to 292m, still in marl, and then ran a wiper trip with no problems. Drilled further to 297m and the P.O.O.H. and ran and cemented the 9.5/8" casing to 292m.

DISCUSSION BY INTERVAL (Cont.)

8½" Hole - 297m to 1176m

After waiting on cement and nippling up, began drilling of the cement and casing shoe on the morning of March 21st, 1983.

As we would still be drilling marl, did not bother to pretreat chemically for cement contamination, as increased calcium ion concentration would help increase clay inhibition. Instead simply diluted with water to control viscosity, and continued this approach while drilling the remainder of the Gellibrand marl. Whenever the returning viscosity at the flowline appeared to be increasing too rapidly, the suction tank was slugged with about 50 bbls water to break up any possible mud ring. Despite this had another small mud ring at 415m, similar to those in the 12¼" hole which again took an hour to clear. Added CONDET and WALLNUT and continued with water additions.

Once we began drilling into the Dilwyn sands, from 480m, treated out the residual calcium to improve water loss control. Viscosity was maintained using some remaining ALCOMER 1773 (a BENEX equivalent).

While drilling the loose sands began having serious problems with the shaker screens blinding and losing mud into the sump. To minimise on water and materials consumption, fluid was returned from the sump directly into the pits. After experimenting with different shaker screens, eventually settled on only one B40 mesh screen on each shaker as the best compromise, as one screen only was much easier to clean. These remained as such until the end of the well.

Until 850m had let the water loss remain naturally at 15 cc's, but as the top of the Pebble Point target was approached, began adding CMC (E.H.V.), with simultaneous water dilution to reduce the water loss to 8 cc's and maintain

.../Cont.

DISCUSSION BY INTERVAL (Cont.)

8½" Hole (Cont.)

a viscosity of 43-45 seconds.

While looking for the Pebble Point Formation the drilling rate was controlled with drilling breaks circulated out. Finally, having drilled into it at 965m, ran a wiper trip without problems, then ran a D.S.T.

After the D.S.T. drilling resumed without controls for eight hours drilling time. As no further shows were expected and the drilling was very rapid, (211m in eight hrs), it was agreed to allow the water loss to relax to 10 cc's and maintained a viscosity of 45-50 seconds to keep the hole clean.

At 1176m, ran a wiper trip without problems, then P.O.O.H. and began Schlumberger logging. However, the tools were unable to pass a bridge at 600m, so had to R.I.H. again and ream through 589.5m to 608m. Then R.I.H. freely to bottom and circulated out before P.O.O.H. During the circulation increased the viscosity to 55 seconds with CMC (E.H.V.) to aid hole cleaning and stability.

The logging was then successfully completed, and then cement plugs set to P. and A. the well.

BEACH PETROLEUM

CURDIEVALE #1

SUMMARY

The Curdievale #1 well was programmed for an AQUAGEL/BENEX Spud Mud with water dilutions in the marl for the 12¼" hole, and an AQUAGEL/BENEX mud with CMC (E.H.V.) below 900m for the 8½" hole.

The main reasons for the use of the BENEX, being as a bentonite extender and also as an aid to solids settling in the sump so that recovered sump water could be used. It should be noted that sump clean up costs on such a relatively cheap (from the mud point of view), can be far higher than the mud costs, so that fluid recovering from the sump can be a significant cost saving.

However the use of BENEX cannot be practically considered while drilling through the marl as it would result in excessively high viscosities. For this reason it would be a better approach to use an inhibiting ion through the marl, either a salt or calcium in the form of LIME, combined with water additions to control viscosity.

The approach that I considered the most applicable and used successfully on the following Green Banks well, was to drill the surface limestone with gel flocculated with LIME, and then continue with additions of LIME and water through the marl. After drilling out of the marl BENEX could be practically used through the sandier sequences following with some water loss control, which was sacrificed while using the LIME. The use of ionic inhibition of clays in the marl will lead to better cuttings at the shaker and consequently less dilution and better settling in the sump as well.

The 8½" hole was quite adequately drilled using the mud as in the original program.

.../Cont.

SUMMARY (Cont.)

Overall the well was successfully drilled from the mud point of view at slightly less than the original programmed mud cost.

BAROID MATERIAL RECAP

COMPANY Beach Petroleum
LOCATION Peterborough, Victoria
WELL Curdievale #1
COST/DAY $560.10
COST/M $5.66
COST/M/DAY $1.89
COST/M³ $6.62
COST/M³/DAY $2.21

MUD TYPE F.W./Gel/Native Clay
CONTRACTOR P.D.S.A.
DRILLING DAYS/PHASE 3
ROTATING HRS/PHASE 19
TOTAL DRILLING 297m
MUD CONSUMPTION FACTOR 0.86 m³/m
DATE 19th March, 1983

PHASE HOLE SIZE 12¼"
INTERVAL TO 297m
FROM Surface

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lbs	15.55			84			$1,306.20
CAUSTIC SODA	40 kg	33.40			2			66.80
ALCOMER 1773	25 kg	210.00			½			105.00
CONDET	200 ltr	202.32			1			202.32
DIESEL								
FRESH WATER					246.5 m³			
SEA WATER								
TOTAL MUD MADE					254 m³			
COST LESS BARYTES								$1,680.32
COST W/BARYTES								$1,680.32

COMMENTS Used an additional 4 Sx LIME and 10 Sx NUTPLUG of old Beach stock. (NUTPLUG used as hole lubricant). Low materials consumption as used native clay from drilled marl, and drilled mostly with only fresh water additions.

BAROID MATERIAL RECAP

COMPANY Beach Petroleum
LOCATION Peterborough, Victoria
WELL Curdievale #1
COST/DAY $261.95
COST/M $2.38
COST/M/DAY $0.30
COST/M³ $9.40
COST/M³/DAY $1.17

MUD TYPE F.W./Gel-Native Clay/CMC
CONTRACTOR P.D.S.A.
DRILLING DAYS/PHASE 8
ROTATING HRS/PHASE 62½
TOTAL DRILLING 879m
MUD CONSUMPTION FACTOR 0.25 m³/m
DATE 27th March, 1983

PHASE HOLE SIZE 8½"
INTERVAL TO 1176m
FROM 297m

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.55			24			$ 373.20
CAUSTIC SODA	40 kg	23.40			4			133.60
ALCOMER 1773	25 kg	210.00			½			105.00
CMC-E.H.V.	25 kg	54.33			25			1,358.25
CONDET	200 ltr	202.32			½			101.16
CALCIUM CHLORIDE	25 kg	12.20			2			24.40
RECLAIMED SUMP WATER					68 m³			
DIESEL								
FRESH WATER					146 m³			
SEA WATER								
TOTAL MUD MADE					223 m³			
COST LESS BARYTES								$2,095.61
COST W/BARYTES								$2,095.61

COMMENTS CALCIUM CHLORIDE used in setting cement plugs. Reclaimed water from sump low in clay content as pump suction floated, and sump had a solids divider.

BAROID MATERIAL RECAP SUMMARY

COMPANY: Beach Petroleum
LOCATION: Peterborough, Victoria
WELL NAME: Curdievale #1
CONTRACTOR: P.D.S.A.
COST/DAY: $343.27
COST/M: $3.21
COST/M/DAY: $0.29
COST/M³: $7.92
COST/M³/DAY: $0.72
RECAPPED BY: M. Olejniczak

MUD TYPES: F.W./Gel-Native Clay
F.W./Gel-Native Clay/CMC

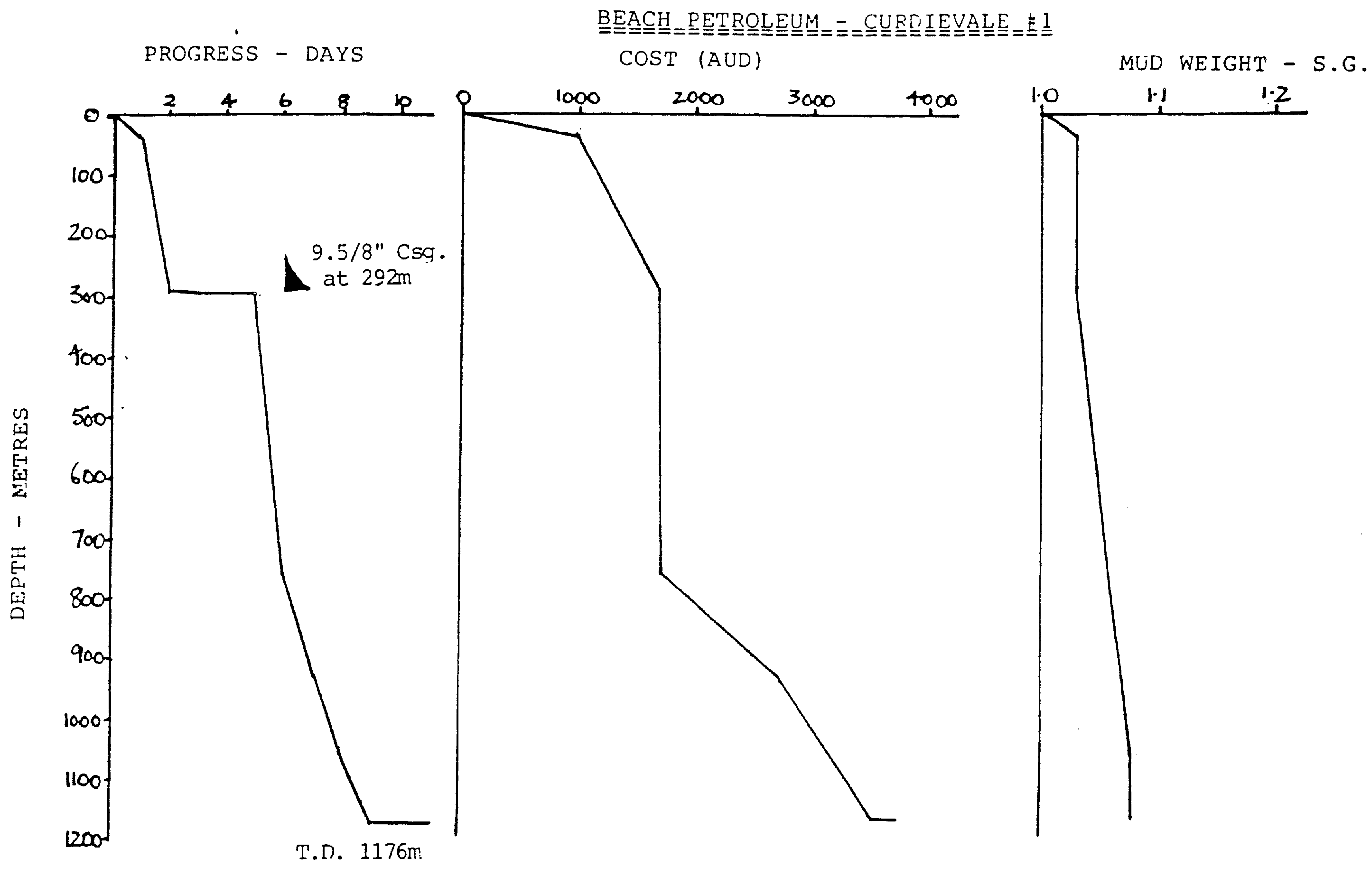
TOTAL DEPTH: 1176m
TOTAL ROTATING HRS.: 71½
TOTAL DAYS ON HOLE: 11
DATE: 27th March, 1983
DATE OF RECAP: 30th March, 1983

HOLE SIZE	AMOUNT HOLE DRILLING	DRILLING DAYS
12¼"	297m	3
8½"	879m	8
TOTAL	1176m	11

WELL AVERAGE MUD CONSUMPTION: 0.41 m³/m

MATERIALS	UNIT	COST UNIT	QUANTITY ESTIMATE	KG/m³	ACTUAL	KG/m³	TOTAL COST ESTIMATE	ACTUAL
AQUAGEL	100 lbs	15.55						
CAUSTIC SODA	40 kg	33.40			108			$1,679.40
ALCOMER 1773	25 kg	210.00			6			200.40
CMC-E.H.V.	25 kg	54.33			1			210.00
CONDET	200 ltr	202.32			25			1,358.25
CALCIUM CHLORIDE	25 kg	12.20			1½			303.48
					2			24.40
ECLAIMED SUMP WATER								
SALVAGE MUD					68 m³			
DIESEL OIL								
RESH WATER m³								
SEA WATER					392.5 m³			
TOTAL MUD MADE m³								
ST LESS BARYTES					477 m³			
ST WITH BARYTES								$3,775.93
COMMENTS								$3,775.93

COMMENTS: Low materials consumption throughout the well is predominantly due to high clay content of drilled solids throughout and also to relaxed mud specifications to take advantage of these conditions.



BEACH PETROLEUM - CURDIEVALE #1
PROGRESS - DAYS
COST (AUD)
MUD WEIGHT - S.G.
DEPTH - METRES
9.5/8" Csg. at 292m
T.D. 1176m

APPENDIX NO. 4

BIT RECORD

PRINTED IN U.S.A.

BIT RECORD

COUNTY	FIELD	STATE	SECTION	TOWNSHIP	RANGE	LOCATION	WELL NO
	Otway Basin	Victoria				Curdievale	1

CONTRACTOR	RIG NO.	OPERATOR	TOOLPUSHER	SALESMAN
P.D.S.A.		Beach Petroleum N.L.	W. Tschacher	

SPUD	UNDER SURF.	UNDER INTER.	SET SAND ST.	REACHED T.D.	PUMP NO 1	LINER	PUMP NO 2	LINER	PUMP POWER	TYPE MUD
17/3/83						6 1/2				

DRILL PIPE	TOOL JOINTS SIZE	TYPE	O.D.	DRILL COLLARS NUMBER	O.D	I.D	LENGTH	DRAWWORKS POWER
	4 1/2	H.W.		14	6 1/2			

NO.	SIZE	MAKE	TYPE	JET 32ND IN	SERIAL	DEPTH OUT (m)	FEET (m)	HOURS	FT. HR	ACCUM DRLG HRS	WT 1000 LBS	R P M	VERT DEV.	PUMP PRESS	PUMP OPER-ATION	SPM 1	SPM 2	MUD WT	MUD VIS	MUD W.L	DULL COND. T	B	G	OTHER	FORMATION REMARKS
1	13 1/2"	H.T.C	R.1	15	V.H 890	.	.														1	1	1		
2	12 1/4"	H.T.C	X3A	15	405KV	297	297	23 1/4	12.77	26 1/4	5	150		400		100		1.03	35	25	1	1	1		
3	8 1/2"	SEC	S.33S	11	869816	887	590	27 1/2	21.45	50 3/4	5	140		360		106		1.07	44	8	8	5	-		
4	8 1/2"	HTC	X3A	12	955PK	1176	289	35 1/2	8.14	86 1/4	14	120		360		105		1.08	48	3	7	3	1/2		

s for the asking . . .

nical information and :o get your holes down with fewer problems. ce on rock bit perfor- e, bit selection, drill analysis, hydraulics ams and recommen- ns on the best bit it and rotary speed. information is tail- for you, your loca- and your rig.

Hughes Tool Com- representative is your source for drilling mation . . . wherever drill.

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APPENDIX NO. 5

WIRELINE LOG INTERPRETATION

J. A. Bowler

CURDIEVALE NO. 1

LOG INTERPRETATION

A. SHALE PARAMETERS

1. $\rho B = 2.45$ $\phi N = 47$ $GR_{sh} = 130$

   $GR_{clean} = 20$ $R = 10.$

2. Minimum value of V shale from D-N and GR is taken as correct amount of shale.

3. $\phi e = \phi t_{\bar{I}}$ (1-V shale)

B. WATER SATURATION

1. Sw is from Indonesian Equation.

2. Rw = 5.6 @ 53^{o}C for levels 1-19. (From DST)

3. Rw = 1.7 @ 41^{o}C from -30 mv SP at 625 m.

C. OTHER RELATED DATA

	R_{WA}	PPM NACl	
1. CURDIE NO. 1			
1025 m	1.7 @ 53^{o}C	2,000	Shaley
1051 m	3.7 @ 53^{o}C	860	less shaley
2. CURDIEVALE NO. 1			
DST NO. 1 935-965 m			
Bottom	3.6 @ 53^{o}C	860	
Middle	5.6 @ 53^{o}C	540	
Mud Filtrate			
	Rmf = 2.97 @ 23^{o}C	1,900	
	= 1.80 @ 53^{o}C	1,900	

D. DETAILED INTERPRETATION

	Depth (m)	ρ_B	ϕ_N	GR	R	V shale D-N	V shale GR	ϕ_T	ϕ_e	SW
1.	1150	2.17	36	80	29	24	45	34	26	88
2.	1143	2.15	30	40	30	8	18	32	29	111
3.	1142	2.46	20	40	130	0	18	17	17	110
4.	1136	2.20	30	40	30	15	18	30	26	103
5.	1122	2.20	27	40	35	9	18	29	26	110
6.	1119	2.14	30	40	30	8	18	32	29	111
7.	1102	2.35	27	50	73	0	27	24	24	104
8.	1089	2.12	35	50	30	15	27	35	30	93
9.	1087	2.45	23	50	100	0	27	19	19	112
10.	1079	2.20	30	40	31	15	18	30	26	102
11.	1071	2.11	36	95	29	15	68	35	30	95
12.	1047	2.18	30	30	29	12	9	31	28	114
13.	1010	2.30	32	60	29	32	36	29	20	86
14.	967	2.25	34	50	41	32	27	31	23	74
15.	962	2.25	36	50	42	36	27	32	23	73
16.	942	2.50	46	90	45	80	64	-	-	-
17.	927	2.43	42	140	40	65	100	-	-	-
18.	924	2.50	51	110	37	100	82	-	-	-
19.	888	2.65	57	100	15	100	73	-	-	-
20.	791	2.20	31	35	12	18	14	30	26	106
21.	772	2.13	34	40	12	15	18	34	28	98
22.	765.5	2.34	32	20	30	40	0	27	27	79
23.	760.5	2.35	27	30	35	0	9	24	24	83
24.	747	2.13	34	20	10	15	0	34	34	109
25.	727	2.05	39	30	10	13	9	39	35	96
26.	701	2.08	36	30	10	12	9	37	34	98
27.	662	2.15	33	20	12	17	0	33	33	103
28.	620	2.60	30	70	70	- 45	-	-	-	-
29.	575	2.10	42	30	15	29	9	40	36	76
30.	541.5	2.60	17	20	70	0	0	12	12	117

J. BOWLER

APPENDIX NO. 6

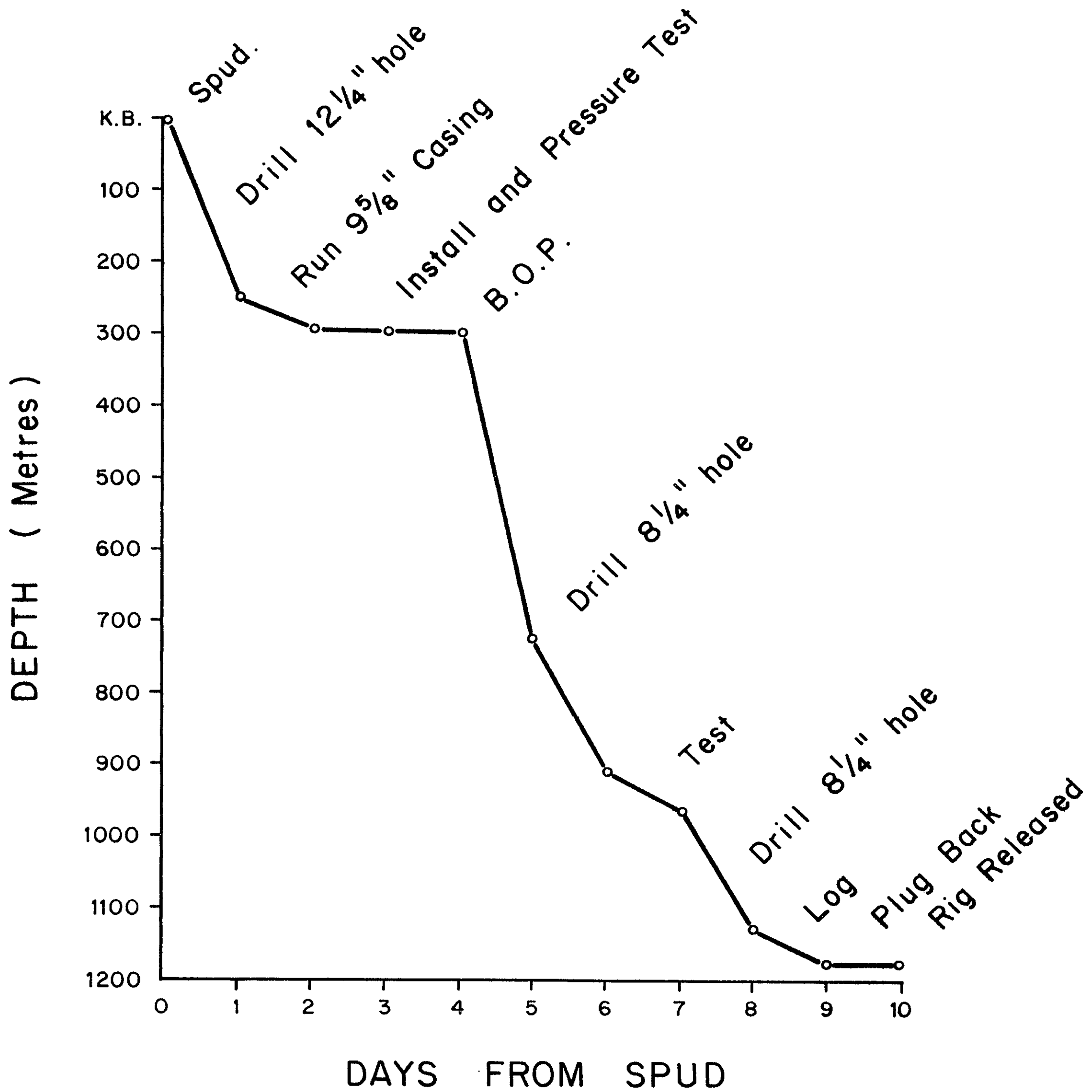
ACTUAL PENETRATION PROFILE

CURDIEVALE No.1

SPUDDED : 0500 – 17/3/83

T.D. 1176m : 0335 – 25/3/83

RIG RELEASE : 0500 – 27/3/83



ACTUAL PENETRATION PROFILE

DRG No.1921

2 4 NOV 1983

APPENDIX 7

PEBBLE POINT FORMATION

WATER ANALYSIS REPORT

WATER ANALYSIS REPORT

.SAMPLE ID. FORMATION WATER 6594/83 AMDEL COMPUTER SERVICES

CHEMICAL COMPOSITION

		MILLIGRAMS PER LITRE MG/L	MILLIEQUIVS. PER LITRE ME/L
CATIONS			
CALCIUM	(CA)	37.0	1.9
MAGNESIUM	(MG)	12.0	1.0
SODIUM	(NA)	180.0	7.8
POTASSIUM	(K)	36.0	0.9
ANIONS			
HYDROXIDE	(OH)	0.	0.0
CARBONATE	(CO3)	0.	0.0
BICARBONATE	(HCO3)	327.	5.4
SULPHATE	(SO4)	71.	1.5
CHLORIDE	(CL)	159.	4.5
NITRATE	(NO3)	4.	0.1

DERIVED AND OTHER DATA

CONDUCTIVITY (E.C.)
MICRO-S/CM AT 25 DEG, C. 1112.

	MILLIGRAM PER LITRE MG/L
TOTAL DISSOLVED SOLIDS	
A. BASED ON E.C.	
B. CALCULATED (HCO3=CO3)	660.
C. RESIDUE ON EVAP. AT 180 DEG. C	
TOTAL HARDNESS AS CACO3	142.
CARBONATE HARDNESS AS CACO3	142.
NON-CARBONATE HARDNESS AS CACO3	1
TOTAL ALKALINITY AS CACO3	268.
FREE CARBON DIOXIDE (CO2)	
SUSPENDED SOLIDS	
SILICA (SIO2)	
BORON (B)	

TOTALS AND BALANCE

CATIONS (ME/L)	11.6	DIFF = 0.2	
ANIONS (ME/L)	11.4	SUM =23.0	

$$\frac{\text{DIFF*100.}}{\text{SUM}} = 0.8\%$$

	UNITS
REACTION - PH	8.2
TURBIDITY (JACKSON)	
COLOUR (HAZEN)	
SODIUM TO TOTAL CATION RATIO (ME/LO	67.6%

NAME: BEACH PETROLEUM NL
ADDRESS: 4/685 BURKE ROAD, CAMBERWELL, VICTORIA, 3124
DATE COLLECTED: 24/3/83
DATE RECEIVED: 30/6/83
SECTION: PEBBLE POINT FORMATION
WELL: CURDIEVALE NO. 1
INTERVAL: 936-965 m
SAMPLE COLLECTED BY: S. Guba

PE601287

This is an enclosure indicator page.
The enclosure PE601287 is enclosed within the container PE902565 at this location in this document.

The enclosure PE601287 has the following characteristics:

```
     ITEM_BARCODE = PE601287
CONTAINER_BARCODE = PE902565
             NAME = Composite Well Log
            BASIN = OTWAY
           PERMIT = PEP 104
             TYPE = WELL
          SUBTYPE = COMPOSITE_LOG
      DESCRIPTION = Composite Well Log (enclosure from WCR)
                    for Curdievale-1
          REMARKS =
     DATE_CREATED = 27/03/83
    DATE_RECEIVED = 25/07/83
             W_NO = W809
        WELL_NAME = Curdievale-1
       CONTRACTOR = Beach Petroleum NL
     CLIENT_OP_CO = Beach Petroleum NL
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601286

This is an enclosure indicator page.
The enclosure PE601286 is enclosed within the container PE902565 at this location in this document.

The enclosure PE601286 has the following characteristics:

ITEM_BARCODE = PE601286
CONTAINER_BARCODE = PE902565
NAME = Exlog Mud Log
BASIN = OTWAY
PERMIT = PEP 104
TYPE = WELL
SUBTYPE = MUD_LOG
DESCRIPTION = Exlog Mud Log (enclosure from WCR) for Curdievale-1
REMARKS =
DATE_CREATED = 25/03/83
DATE_RECEIVED = 25/07/83
W_NO = W809
WELL_NAME = Curdievale-1
CONTRACTOR = EXLOG
CLIENT_OP_CO = Beach Petroleum NL

(Inserted by DNRE - Vic Govt Mines Dept)

PE605074

This is an enclosure indicator page.
The enclosure PE605074 is enclosed within the container PE902565 at this location in this document.

The enclosure PE605074 has the following characteristics:

```
      ITEM_BARCODE = PE605074
 CONTAINER_BARCODE = PE902565
              NAME = Neutron Formation Density Log
             BASIN = OTWAY
            PERMIT = PEP 104
              TYPE = WELL
           SUBTYPE = WELL_LOG
       DESCRIPTION = Compensated Neutron Formation Density
                     Log 1:200 & 1:500, run 1 (enclosure
                     from WCR) for Curdievale-1
           REMARKS =
      DATE_CREATED = 26/03/82
     DATE_RECEIVED = 29/03/82
              W_NO = W809
         WELL_NAME = Curdievale-1
        CONTRACTOR = Schlumberger
      CLIENT_OP_CO = Beach Petroleum NL
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE605073

This is an enclosure indicator page.
The enclosure PE605073 is enclosed within the container PE902565 at this location in this document.

The enclosure PE605073 has the following characteristics:

ITEM_BARCODE =	PE605073
CONTAINER_BARCODE =	PE902565
NAME =	Borehole Compensated Sonic Log
BASIN =	OTWAY
PERMIT =	PEP 104
TYPE =	WELL
SUBTYPE =	WELL_LOG
DESCRIPTION =	Borehole Compensated Sonic Log 1:200 & 1:500, run 1 (enclosure from WCR) for Curdievale-1
REMARKS =	
DATE_CREATED =	26/03/82
DATE_RECEIVED =	29/03/82
W_NO =	W809
WELL_NAME =	Curdievale-1
CONTRACTOR =	Schlumberger
CLIENT_OP_CO =	Beach Petroleum NL

(Inserted by DNRE - Vic Govt Mines Dept)

PE605072

This is an enclosure indicator page.
The enclosure PE605072 is enclosed within the container PE902565 at this location in this document.

The enclosure PE605072 has the following characteristics:

```
      ITEM_BARCODE = PE605072
 CONTAINER_BARCODE = PE902565
              NAME = Dual Laterolog
             BASIN = OTWAY
            PERMIT = PEP 104
              TYPE = WELL
           SUBTYPE = WELL_LOG
       DESCRIPTION = Dual Laterolog 1:200 & 1:500, run 1
                     (enclosure from WCR) for Curdievale-1
           REMARKS =
      DATE_CREATED = 26/03/82
     DATE_RECEIVED = 29/03/82
              W_NO = W809
         WELL_NAME = Curdievale-1
        CONTRACTOR = Schlumberger
      CLIENT_OP_CO = Beach Petroleum NL
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601294

This is an enclosure indicator page.
The enclosure PE601294 is enclosed within the container PE902565 at this location in this document.

The enclosure PE601294 has the following characteristics:

ITEM_BARCODE = PE601294
CONTAINER_BARCODE = PE902565
NAME = Volan Computer Processed Log
BASIN = OTWAY
PERMIT = PEP 104
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = Volan, Av Advanced Synergetic* Log Using Dual Water System, Shclumberger Computer Processed Log (enclosure from WCR) for Curdievale-1
REMARKS =
DATE_CREATED = 18/05/83
DATE_RECEIVED = 25/07/83
W_NO = W809
WELL_NAME = Curdievale-1
CONTRACTOR = Schlumberger
CLIENT_OP_CO = Beach Petroleum NL

(Inserted by DNRE - Vic Govt Mines Dept)