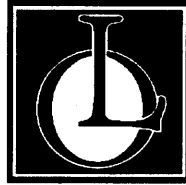




Protea-1 Well Completion Report

PAGE 1 OF 82



LAKES OIL N.L.
(A.B.N. 62 004 247 214)

PROTEA No.1

STRATIGRAPHIC WELL

WELL COMPLETION REPORT

BY

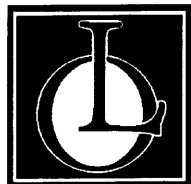
D.R. HORNER & J.N. MULREADY

(W1358)

LAKES OIL N.L.
LEVEL 11,
500 COLLINS STREET,
MELBOURNE 3000

May 2003

913672 002



LAKES OIL N.L.

(A.B.N. 62 004 247 214)

PROTEA No.1

STRATIGRAPHIC WELL

WELL COMPLETION REPORT

30 JUN 2003

BY

D.R. HORNER & J.N. MULREADY

LAKES OIL N.L.
LEVEL 11,
500 COLLINS STREET,
MELBOURNE 3000
MAY 2003

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Protea No.1 Location Map

913672 005Y



Figure 1

1.0 SUMMARY

Protea No.1 stratigraphic hole was located in PEP 157 and was drilled as a follow up well to Boundary Creek No.1A corehole and the Deadman Hill No.1 stratigraphic well. Boundary Creek No.1 encountered reservoir quality Strzelecki Formation section. Protea No.1 is located onshore in the Longford area of Gippsland, being off Clancy Street off Merricks Road, Longford, approximately 12 Km SE of Sale (refer Location Map).

The well was drilled to provide stratigraphic and reservoir information regarding both the Golden Beach Formation and Strzelecki Formation at this location. The Golden Beach Formation was intersected at 323 m KB

Core No.1 was cut within the Strzelecki Formation over the interval 349.5 to 556.0 m, recovering 0.8 m (12%). Since the recovery consisted of claystone no ocre analysis was undertaken.

Palynology age dating was undertaken on a sample from the core. (refer Appendix 2).

Protea No.1 was spudded at 0730hrs 3rd June, 2002. A 12.25" (311 mm) hole was drilled to 8.5m and 9.625" (244 mm) conductor set at 8.4m. An 8.5" (216 mm) hole was then drilled from 8.5m to 345m utilizing a PHPA/KCl /polymer mud system.

Quaternary Gravels were present from surface to 13 meters. No Gippsland Limestone or Lakes Entrance Formation was encountered. The Latrobe Group was encountered at 13 meters, and extended to 323 meters where the Golden Beach Formation was penetrated. Gas readings through the Latrobe Group were between 0 and 3 units, with no oil fluorescence observed. Excellent reservoir quality sands existed throughout the Latrobe Group interval.

Seven inch (178 mm) casing was set at 334m, the BOP's were nipped up and pressure tested, and after the shoe track was drilled out a core was cut from 349.5 to 356.0 meters with 0.8m of recovery. The well began flowing sand and water during coring. The mudweight was increased to 9.1 lb/gal, and a cement plug emplaced at the shoe before drilling 6.125" hole recommenced.

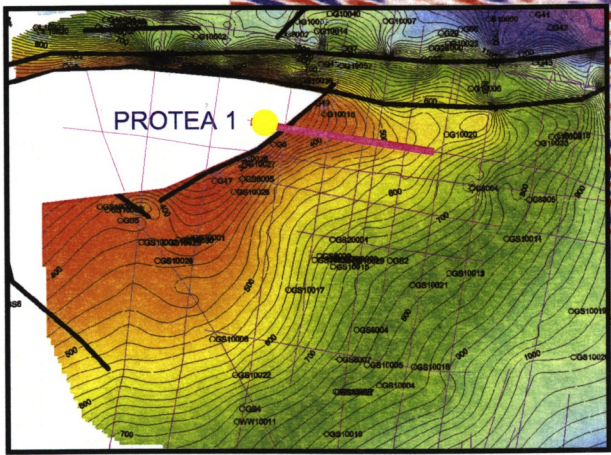
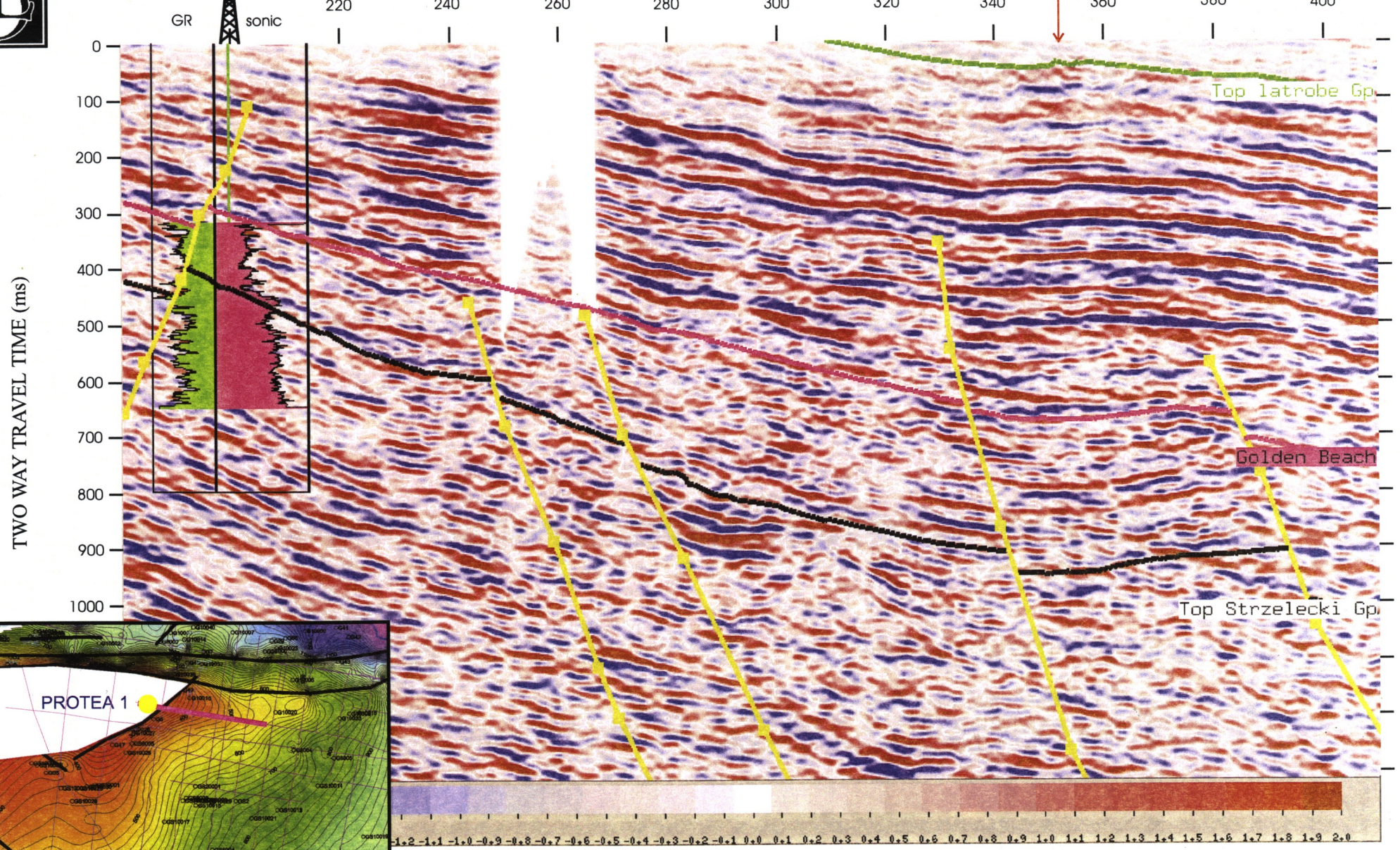
The well was then drilled to 609 m. at which stage drilling was suspended awaiting rig repairs. Subsequently the well was drilled to a total depth of 825 m. bottoming in Strzelecki Formation.

Schlumberger wireline logs were run prior to plugging and abandonment of the well. The rig was released on the 19 June 2002.

~~P-913672 colour 0/2~~



W PROTEA 1 220 240 260 280 300 320 340 360 380 400 E



PROTEA 1
SEISMIC SECTION GCRP91A-12

913672 007

Figure 2a



W

GCRP91A-12

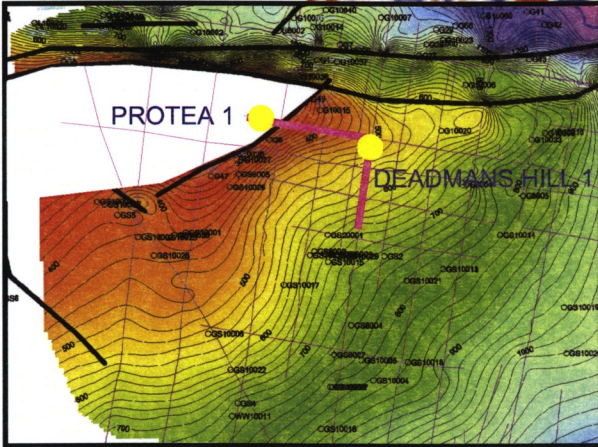
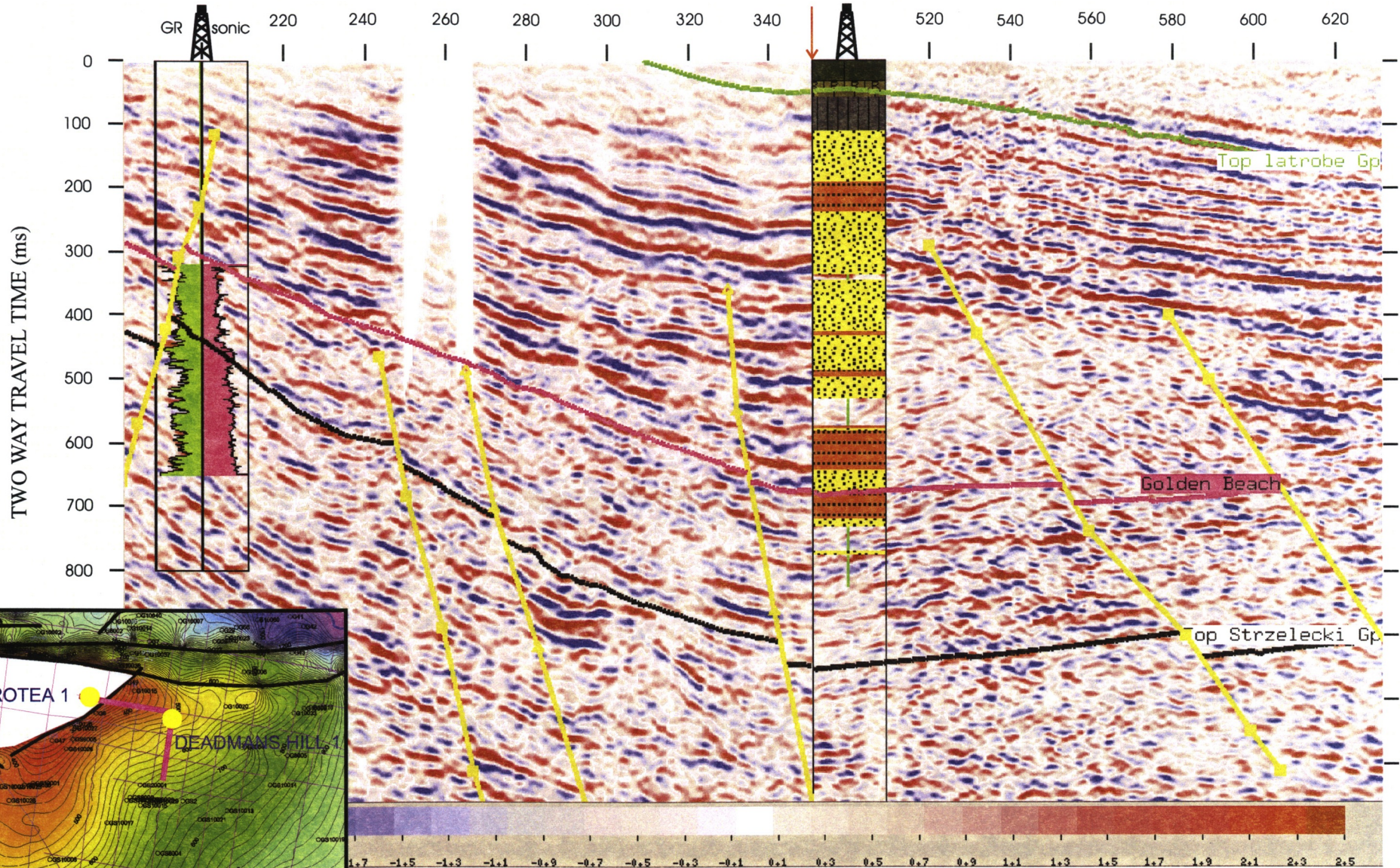
EN

GH85-4

S

PROTEA 1

DEADMANS HILL 1



PROTEA 1 & DEADMANS HILL 1
COMPOSITE SEISMIC SECTION GCRP91A-12 & GH85-4

913672 008

Figure 2b

2.0 WELL HISTORY**2.1 GENERAL DATA**

2.1.1	Well Name and Number	Protea No.1
2.1.2	Location	512877 E 5772884 S
2.1.3	Elevations	G.L. 50.0 m A.S.L. R.T. 51.0 m A.S.L.
2.1.4	Petroleum Tenement	PEP 157
2.1.5	Name of Operator	LAKES OIL N.L. A.C.N. 004 247 214 Level 11 500 Collins Street, Melbourne.
2.1.6	Other Participants	None
2.1.7	Date Drilling Commenced	3 June, 2002
2.1.8	Date Drilling Completed	18 th June, 2002
2.1.9	Date Rig Released	19 th June, 2002
2.1.10	Drilling Time to T.D.	16 days
2.1.11	Total Depth	825 m.
2.1.12	Status	Plugged and abandoned

2.2 RIG DATA

2.2.1 Drilling Contractor	Sides Engineering Pty Ltd 25 Garden Road, Clayton, Vic. 3168
2.2.2 Rig	Bourne 2000THD
2.2.3 Rig Carrier	Twin Steer Tri-axle
2.2.4 Weight Indicator	Hydraulic Pressure
2.2.5 Power	Cummins - Truck Engine
2.2.6 Rotary	Top Drive
2.2.7 Blocks	Not applicable
2.2.8 Pumps	Clarke 5.5X10 3 Cylinder Duplex
2.2.9 Mud mixing	Gardner Denver Duplex
2.2.10 Sump pump	Not applicable
2.2.11 Transfer Pump	Wreckair - Worm Drive
2.2.12 Tubulars	3.5" X 13.30 D.P.
2.2.13 Fishing Tools	None on Site
2.2.14 Handling Tools	Rented Tasman
2.2.15 Stabilizer	12.25", 8.5" , 6"
2.2.16 Spare Parts	As reasonably required to conduct operations for programmed well
2.2.17 Personnel	Driller plus 4 crew
2.2.18 Drilling Hours	Rig Operated Daylight Hours Only.

Diagrammatic Cross-section Boundary Ck#1A-Protea#1-Deadman Hill#1

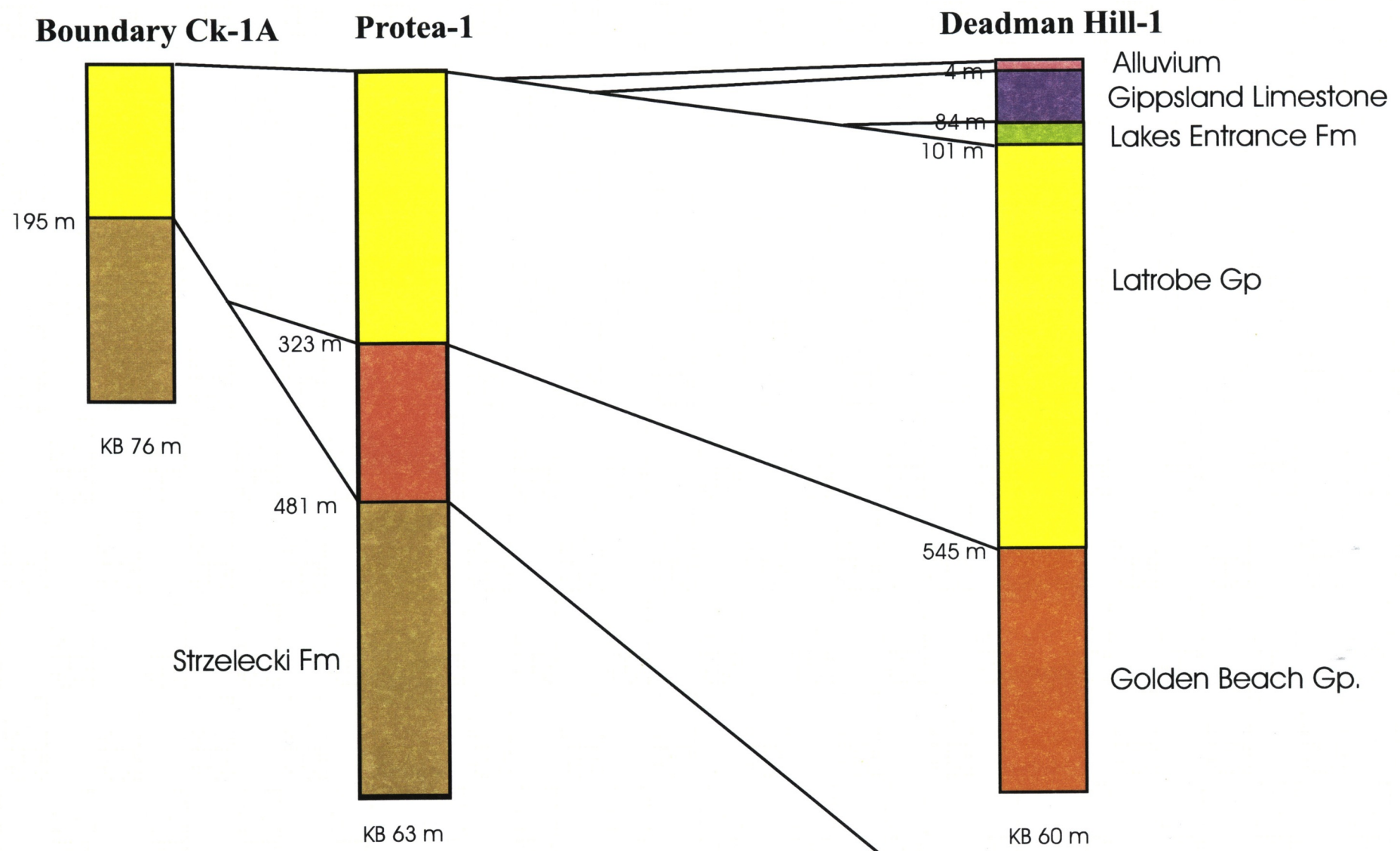


Figure 3

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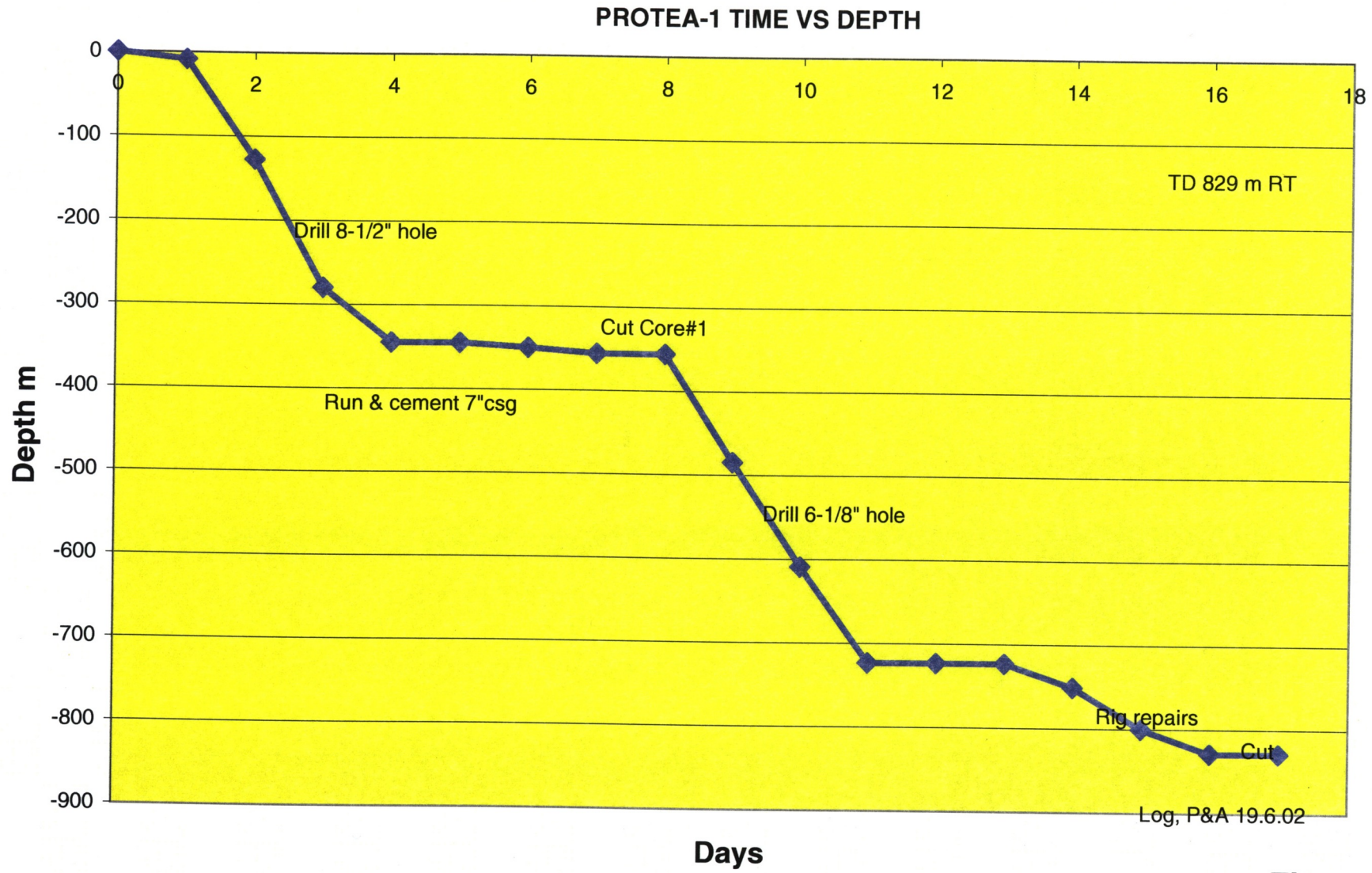


Figure 4

913672 012

2.3 DRILLING DATA

913672 013

2.3.1 The following is the daily operations summary for Protea No.1. It has been compiled from the daily drilling reports. Onsite drilling supervision for Lakes Oil N.L. was provided by W. Westman. Further details are provided in the time/depth curve (Figure 4).

DATE	HOURS	OPERATION
03-06-02	0.5	Move in and rig up.
	1.0	Spud Protea No.1 at 0730 hrs 3 rd June, 2002.
	7.0	Drill 12.25" (311 mm) hole to 8.5m RT.
	3.0	Cement 9.625" (244 mm) conductor at 8.4m.
	1.0	Nipple up BOP's and function test. Shut down for night.
04-06-02	0.5	Travel from town. Start up. Function test BOP.
	5.0	Repair hydraulics in mast.
	5.0	Drill 8.5" (216 mm) hole from 8.5 to 128m.
	1.0	Circulate clean. POOH to DC's.
	0.5	Shut down for night.
05-06-02	0.5	Travel from town. Service rig. Start up.
	1.0	RIH to bottom. No fill. Break circulation.
	8.5	Drill to 280m.
	1.5	Circulate clean. POOH to DC's.
	0.5	Shut down for night.
06-06-02	0.5	Travel from town. Service rig. Start up.
	1.0	RIH to bottom. 6m. fill. Break circulation.
	5.5	Drill 8.5" (216 mm) hole from 280 to 345m.
	0.5	Circulate clean.
	3.5	POOH. Prepare to run casing.
	0.5	Shut down for night.
07-06-02	0.5	Travel from town. Service rig. Start up.
	4.0	R/u and run 7" (178 mm) casing. Held up at 334m.
	1.5	R/u to circulate. Unable to circulate or move pipe. R/d 20 ton crane.
	1.0	Attempt to circulate. R/u 30 ton crane.
	1.5	Reciprocate casing. Unable to circulate.
	0.5	Land csg. Lift BOP. Cut casing. N/u BOP.
	2.0	RIH w/ drilling assembly to clean out casingg. Drill out float & clean out sand. No obvious obstruction.
	1.0	Establish circulation.
	0.5	Shut down for night.

<p>08-06-02</p> <p>0.5 0.5 2.5 0.5 1.0 2.0 2.0 0.5 0.5 1.0 0.5</p>	<p>Travel from town. Service rig. Start up. Check for circulation around casing annulus - OK. POOH. R/u to cement. Pump cement. Pressure increase after 5 bbls pumped. Continue with job. Insert top plug and begin disp. Found valve passing fluid. Cement locked up before displacement complete. P/test BOP while repairing pull down shaft. Pipe rams / choke manifold 200 PSI low 1000PSI high 10 mins OK. RIH. Drill out plug and cement. Drill 345 to 349.5m. Circulate bottoms/up 10 mins. Conduct LOT. Equivalent mud wt 9.9 lb/gal. POOH. Prepare to cut core #1. Shut down for night.</p>
<p>09-06-02</p> <p>0.5 1.0 2.0 1.0 1.5 1.0 1.0 1.0 1.0 1.5 0.5</p>	<p>Travel from town. Service rig. Start up. POOH to core. P/u core barrel & RIH. Circulate. Wash to bottom. Core from 349.5 to 356m. POOH to csg shoe. Well seemed to be filling w/ fine running sand & flowing water. Circulate. Observe well. Losing returns. POOH. Core barrel plugged w/ sand. Attempt to recover core. Inner barrel wedged w/ sand. Lay down barrel. RIH w/ drilling assembly. Secure well. Shut down for night.</p>
<p>10-06-02</p> <p>0.5 1.5 0.5 0.5 1.5 4.0 2.0 0.5 0.5 0.5</p>	<p>Travel from town. Service rig. Start up. RIH. Tagged sand at 241m. Circ/wash down to 283m - sheets of sand across shakers. POOH 6 jts. Float stuck open, string sanded up. Recover core. POOH. 1.5 DC's full of sand. RIH w/ open ended pipe. Tag at 263m. Wash down to 343m. Circulate and wait on cement truck. Pump cement. Pull 20 jts. Circulate pipe clean. Shut down for night.</p>
<p>11-06-02</p> <p>0.5 1.0 1.0 8.0 0.5 0.5 0.5</p>	<p>Travel from town. Service rig. Start up. POOH. RIH. 6.125" (156 mm) bit, 6XDC, 3.5" DP. Tag cement at 333m. Drill ahead to 485m. Circulate bottoms up. POOH to 321m. Shut down for night.</p>
<p>12-06-02</p> <p>0.5 0.5 0.5 0.5 7.3 1.3 0.5 0.5</p>	<p>Travel from town. Service rig. Start up. RIH. Change hydraulic filters. Low hydraulic power. RIH. Drill ahead 485 to 609m. POOH. Maintenance. Shut down for night.</p>

13-06-02	0.5 1.5 0.5 1.0 0.5 4.0 1.5 0.5 01.0	Travel from town. Service rig. Start up. POOH. Change BHA/bit – old bit undergauge. RIH. Safety meeting. RIH to shoe, condition mud. RIH. Fill from 450m to hard bridge at 475m. Ream from 450 to 609m. (Due to undergauge bit?). Circulate bottoms up. POOH. Shut down for night.
14-06-02	0.5 4.5 ***	Travel from town. Service rig. Start up. Repair crown. Empty sump. Refuel. Wait on rig spares
15-06-02	0.5 ***	Travel from town. Repair crown.
16-06-02	0.5 3.0 1.0 5.5 0.5 0.5 1.0 0.5	Travel from town. Service rig. Start up. Repair rig. Stand rig up. Break circulation. RIH. Hole bridged at 475 and 579m. Wash down to bottom. Drill ahead 609 to 751m. POOH. Circulate hole whilst repairing hydraulics. POOH Shut down for night.
17-06-02	12	Repair rig crown
18-06-02	0.6 2.0 1.3 0.3 3.0 4.0 0.3	Travel from town. Service Rig RIH Wash to bottom Drill to 825 m Circulate hole clean POOH to log Run Schlumberger logs Secure well for the night
19-06-02	0.6 1.3 0.3 2.0 0.3 0.3 4.3 2.0	Travel from town. Service Rig RIH to 495 m. Set 50 m balanced cement plug from 495-445 m. POOH to 360 m. Wait on cement truck Set balanced cement plug 360 to 310 m. POOH to 200 m. Circulate clean. Wait on cement. POOH. Release rig. Commence rigging down

2.3.2 Hole sizes and depths:

12.25" (311mm) Spud to 8.5m.

8.5" (216mm) 8.5 to 345m.

6.125" (156mm) 345 to 825m.

Casing and cementing:

SURFACE:

SIZE:	9.625" / 244 mm
Weight:	64.9 kg/m
Grade:	K55
Shoe setting depth:	8.4m

INTERMEDIATE:

SIZE:	7" / 178 mm
Weight:	34.2 kg/m
Grade:	K55
Shoe setting depth:	338m

2.3.3 Deviation Surveys:

None taken.

2.3.3 Drilling Fluid:

(A) Spud - 8.5 meters: Type: Freshwater/Gel spud mud.

(B) 8.5 - 825m. KCl/Polymer/PHPA.

Physical Mud Properties:

DEPTH	PPG	VIS	KCL %	PHPA LB/GAL
250	8.7	32	4	0.5
340	9	34	4	0.5
723	9.1	37		
751	9.2	35		
609	9.1	32		

2.3.5 Water Supply:

Water was trucked to site from Sale.

2.3.6 Perforation:

None.

2.3.7 Plugging and Cementing:

- Plug 1. 495-445 m
- Plug 2. 360 to 310 m.
- Plug 3. Surface -10 m.

2.3.8 Bit Data

BIT RUN	1	2	3	4	5
Diameter	12.25"	8.5"	6.125"	6"	6.125"
Type & Manufacture	Security S33	Varel L127	Varel 117	Core Head	Varel ETD14
IADC code	114	127	117		437
Serial number	209393	537086			176346
Nozzles	Open	Open	11,11,11		11,11,11
Depth in (m)	0	9	345	350	
Depth out (m)	8.5	345	350	356	
Drilled (cum/daily)	8.5	337	5	7	
Hours (cum/daily)	1	14	0.5	1.5	
Dull grade		7.7.WT.A.O.I.TD			
Av. ROP m/hr		24		6	
WOB Klbs		5	1	2	
RPM		100	100	100	
Jet Velocity					
HHP@Bit					
BHA		Bit/2DC/4DC			

2.4 LOGGING AND TESTING

2.4.1 Wellsite Geologist:

J. Mulready (Spud to 128m) David Horner (128 to 825m T.D.)

2.4.2 Mudlogging:

Hot wire hydrocarbon detection, depth and drill rate monitoring was provided by Denis Sisely.

2.4.3 Ditch Cutting Samples:

Cuttings were collected at 5 meter intervals from spud to 345m, then at 3m intervals to 825m (T.D.)

These being 1 set 500gm unwashed calico bag, and 1 set washed samplex tray.

2.4.4 Coring:

1 X 9 m core was cut from 349.5 to 356m (0.8m recovery (12%)).
See core analysis report.

2.4.5 Sidewall Cores:

No sidewall cores were taken.

2.4.6 Testing:

No tests were conducted.

2.4.7 Wireline Logs:

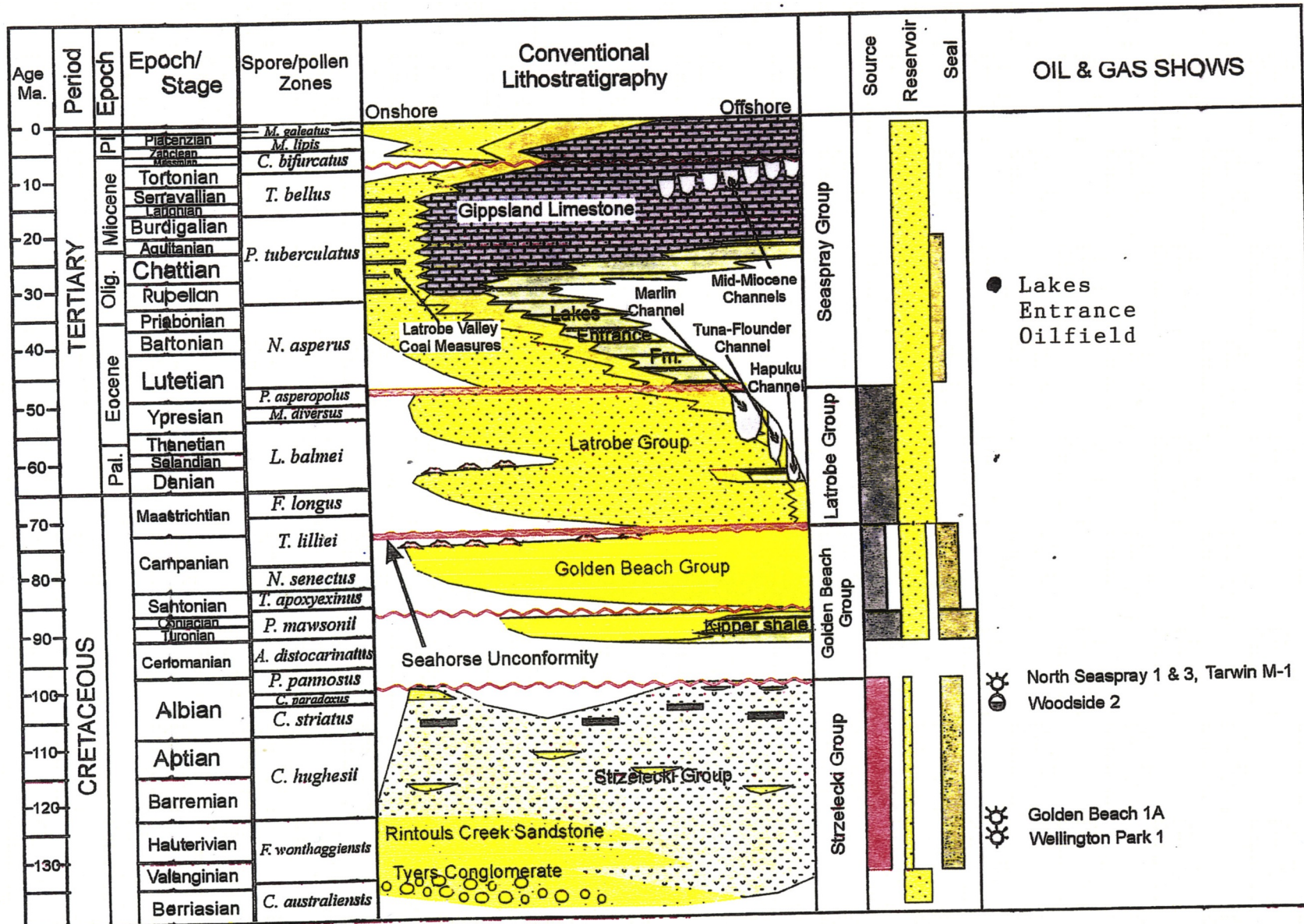
DT-GR-FMI (778m to shoe at 338m) GR to surface.

2.4.8 Bottom Hole Temperature :

32° Centigrade

2.4.9 Velocity Survey:

No velocity survey was conducted.



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LITHOSTRATIGRAPHY
GIPPSLAND BASIN

TABLE 1

913672 019

TABLE II
STRATIGRAPHIC TABLE PROTEA No.1

AGE	FORMATION	DEPTH RT	ELEVATION	THICKNESS
Quaternary	Quaternary Gravel	1	+50	12
Miocene-Oligocene	Gippsland Limestone	Not present	-	-
Oligocene	Lakes Entrance Fm	Not present	-	-
E Oligocene - Eocene	Latrobe Group	13	+38	234
Late Cretaceous (Turonian)	Golden Beach Fm (Emperor Sub-Group)	323	-272	158
Early Cretaceous	Strzelecki Fm	481	-431	344+
	Total Depth	825	-775	

- all depth are in meters.

3. GEOLOGY

3.1 REGIONAL GEOLOGY

The Gippsland Basin is an early Cretaceous to Cainozoic basin occupying approximately 46,000 square kilometers of the southeastern margin of the Australian continent. The basin is flanked on the north, west and south-west by Palaeozoic rocks and confined between the structural uplifts of the Victorian Highlands in the north and the Bassian Rise in the south. The eastern margin of the basin is open to the Tasman sea. The Gippsland Basin is an east-west trending half graben feature with 70% of its area beneath Bass Strait and 30% onshore.

With the exception of occasional wildcat drilling in the boom of the 1980's, exploration of the onshore Gippsland Basin has been largely ignored since the 1970's.

The early exploration activities in the onshore part were aimed primarily at the Early Cretaceous Strzelecki Group and, later on after successful drilling offshore, at the top of the Latrobe Group "coarse clastics", but a lack of understanding of the stratigraphy and the mechanism of hydrocarbon generation, migration and timing of structures, along with the poor quality of the seismic and well log data, resulted in a downgrading of the hydrocarbon potential of the onshore area.

3.2 EXPLORATION HISTORY

Hydrocarbon exploration commenced in the onshore region of the basin in 1924 when the Lake Bunga wildcat well encountered traces of oil, leading to the discovery and development of the Lakes Entrance oil field. The oil accumulation is found in a stratigraphic trap within a glauconitic sand member of the Oligocene Lakes Entrance Formation. The field produced a total of 10,000 bbls of 15.7 API gravity oil before production ceased in 1956. Aside from the Lakes Entrance oil accumulation, wet gas flowed to the surface during testing from the Strzelecki sandstones at North Seaspray 1 and 3, Gangell-1 and Trifon-1.

Petroleum exploration in the permit commenced in the early 1960's and continued into the early 1970's, conducted mainly by Woodside and Arco with eight wells being drilled within the permit. This exploration originally had as its main objective the Strzelecki Group with emphasis moving to the Latrobe Group later in this period. Few of these wells, except for North Seaspray-1, are thought to be located within closure at the Top Latrobe Group level.

Several shallow bores have been drilled in the vicinity of PEP 157 by Victorian Electricity, Coal and Water Resources authorities; however, none of these bores encountered Latrobe Group reservoirs at a significant depth or within closure.

During 1985, Hartogen Energy Ltd drilled Burong-1 to test the Top Latrobe at the crest of a northeast trending asymmetrical anticline which is fault controlled to the northwest. While the Latrobe section contained excellent reservoir rock, no significant shows were recorded within this section.

Recently, Lakes Oil has drilled nine wells within their onshore Gippsland permits; PetroTech-1 targeted greensands of the Lakes Entrance Formation but was not tested; Hunters Lane-1 produced oil from the same formation but at a non-economic rate; Baudin-1 and Investigator-1, which both targeted Lower Latrobe Formation sands, were unsuccessful, probably due to lack of seal. North Seaspray-3, Trifon-1 and Gangell-1 drilled between 2000 and 2001, all targeted Strzelecki Formation sands. Boundary Creek-1 corehole was drilled in 2001 to obtain information on reservoir quality within the Strzelecki Formation.

3.3 PERMIT PEP 137 (now PEP 157)

Lakes Oil N.L. acquired the PEP 137 permit in April 1999, following the drilling by Roma Petroleum N.L. of the McCreesh-1 well, an unsuccessful test of the top Latrobe Group sands. PEP 137 covered an area of 1,680 square kilometers within the onshore Gippsland Basin. The permit extends over the northern part of the Seaspray Depression, the southern portion of the Lake Wellington Depression and part of the Baragwanath Anticline. Ten exploration wells have been drilled from 1962 - 2002, with Lakes Oil N.L. having tested gas at the North Seaspray-3, Trifon-1 and Gangell-1. North Seaspray-3 was a follow up to Woodside/Lakes Oil North Seaspray-1 well, which also flowed gas from the top of the Strzelecki Formation.

3.4 TECTONIC HISTORY

The Gippsland Basin is a rift basin, which originated in the Late Jurassic to Early Cretaceous and consists of alternating half graben structures along its east-west trend. It is characterised by a deep central basin, flanked by northern and southern terraces. In the onshore area, the Late Cretaceous movements were accompanied with volcanism in the western margin of the basin. Several phases of positive structural inversion occurred in the Gippsland Basin from Mid-Oligocene to the present time, creating the major hydrocarbon bearing structures seen in the offshore region. The main phase occurred during the Late Miocene, which resulted in inversion of existing features and the creation of anticlinal structures.

3.5 STRUCTURAL ELEMENTS

The onshore area can be tectonically sub-divided into six major areas:

- (A) Lakes Entrance Platform (Northern Platform): This lies immediately south of the Eastern Highlands, where the Palaeozoic Basement gently slopes southwards and is unconformably overlapped by Oligocene - Miocene marine sediments and thin Pliocene - Quaternary continental deposits.
- (B) Latrobe Valley Depression: This lies between the Palaeozoic Eastern Highlands to the north and the Early Cretaceous Balook Block to the south. Over 700 meters of continental Latrobe Valley sediments are present in this area.
- (C) Lake Wellington Depression: This lies to the south of the Lakes Entrance Platform, where over 1200 meters of Eocene to Pliocene sediments unconformably overlie the Early Cretaceous rocks. This trough is offset from the Latrobe Valley Depression to the west, by left lateral displacement on the Yinnar Transfer Fault Zone which occurred during the Tertiary. The boundary also closely coincides with the western limit of marine Tertiary sediments. To the east it merges with the Strzelecki Terrace.

- (D) **Baragwanath Anticline:** This is the eastern extension of the outcropping Balook High. It is an Early Cretaceous block, which was elevated during the Late Miocene time as a result of the renewed lateral strike slip wrenching along the Boundary Fault Systems. It separates the Lake Wellington Depression to the north from the Seaspray Depression to the south. On the crest of the structure, thin Miocene strata are succeeded unconformably by a veneer of Pliocene-Pleistocene sediments. On the flanks of the structure, however, the Miocene sediments wedge out towards the crest by onlap at the base and erosion at the top of the sequence.
- (E) **Seaspray Depression:** This is the onshore extension of the Central Deep. It occupies the southern onshore part of the basin, where the most complete stratigraphic section is present. The permit occupies the northeastern end of the Seaspray Depression.
- (F) **South Terrace:** Wilson's Promontory is an erosional remnant of a broad shallow basement platform bounding the Gippsland Basin on its southern side. The Southern Terrace represents the edge of this platform. The Chitts Creek Conglomerate onlaps the South Terrace as a mirror image to the Tyers Conglomerate on the North Terrace.

3.6 REASONS FOR DRILLING

Protea-1 was drilled to provide stratigraphic and reservoir information on the Golden Beach Formation and the Strzelecki Formation at this location. One 9 meter core was programmed to be taken at the top of the Golden Beach Formation for palynological analysis and one 9 meter core within the Strzelecki Formation for palynology and porosity/permeability analysis. In the event only one core was cut within the Golden Beach Formation.

3.7 STRATIGRAPHIC PROGNOSIS

The stratigraphic prognosis was made utilising the sparse nearby well data and the available seismic coverage.

A comparison between prognosed and actual formation tops is given below:

FORMATION	PROGNOSED (mKB)	ACTUAL (mKB)	ACTUAL (MsS)	DIFFERENCE (m)
Quaternary Gravel	Surface	Surface	Surface	0
Gippsland Limestone	4	Not present	-	-
Lakes Entrance Formation	60	Not present	-	-
Latrobe Group	72	13	+38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation	187	481	-430	294 Low
Total Depth	600	825	-775	225 Low

3.8 STRATIGRAPHY

QUARTENARY GRAVEL (1 - 13 meters)

1 - 13 meters

SANDSTONE: (100%) orange brown, fine to medium, subangular, clear and orange quartz grains in a sparse argillaceous and calcareous matrix, friable - often with loose grains in sample, no oil fluorescence.

GIPPSLAND LIMESTONE

Not Present.

LAKES ENTRANCE FORMATION

Not Present

LATROBE FORMATION (13 - 323 meters)**13 - 128 meters**

SAND: (90%) loose grains, light grey, fine to coarse, subangular, clear to light grey, occasionally white, well sorted, no

oil fluorescence.

In general becoming coarser with depth and grading to to:

SAND: light grey, clear, white, very coarse grained to pebbly, subangular to subrounded, no oil fluorescence.

Interbedded with:

COAL: (10%) grey black, soft.

128 - 145 meters

COAL: (70%) dark orange brown to very dark brown to rarely black, irregular to blocky fracture rarely fibrous, earthy

texture and lustre, often very argillaceous, rare amber, moderately hard.

Interbedded with

SANDSTONE: (30%) very light grey, very fine to grit, dominantly coarse, angular to subrounded, dominantly subangular, poor to moderate sorting, weak to moderate silica cement, trace dark grey argillaceous matrix, clear to opaque quartz grains, rare grey green and orange brown lithics, trace to common black coaly detritus, trace to common coarse mica flakes, trace pyrite, friable, fair to very good inferred porosity, no oil fluorescence.

145 - 212 meters

SANDSTONE: (100%) very light grey, very fine to pebble, dominantly very coarse - in general becoming coarse with

depth, angular to subrounded, dominantly subangular, poor to moderate sorting, weak silica cement, trace off white

argillaceous matrix, clear to opaque quartz grains, trace grey green lithics, trace black coaly detritus, trace coarse mica

flakes, trace pyrite, friable to unconsolidated, very good inferred porosity, no oil fluorescence.

With minor detrital and thinly interbedded:

COAL: (Trace) very dark brown to dominantly black, irregular to blocky fracture, earthy texture and lustre, very argillaceous in part, moderately hard.

212 - 222 meters

Massive Claystone:

CLAYSTONE: (100%) off white to very pale brownish white, (kaolinitic?), very soft, sticky, amorphous.

222 - 318 meters

Massive Sandstone:

SANDSTONE: (100%) very light grey, very fine to pebble, dominantly very coarse, angular to subrounded, dominantly subangular, poorly sorted, weak silica cement, trace to rarely common off white argillaceous matrix, clear to opaque quartz grains, trace grey green lithics, trace coarse mica flakes, trace black coaly detritus, rare pyrite, friable, very good inferred porosity, no oil fluorescence.

318 - 323 meters

CLAYSTONE: (40%) off white to medium grey, trace black carbonaceous specks, trace micromica, soft, sticky, amorphous.

Grading to and interbedded with:

SANDSTONE: (60%) light grey, very fine to pebble, dominantly very coarse, angular to subrounded, dominantly subangular, poorly sorted, weak silica cement, abundant off white to medium grey argillaceous matrix, clear to milky quartz grains, trace grey green lithics, trace black coaly detritus, common to abundant pyrite, friable, good inferred porosity, no oil fluorescence.

GOLDEN BEACH FORMATION - EMPEROR SUBGROUP (323 - 481 meters)**323 - 345 meters**

CLAYSTONE: (60%) medium grey, slightly silty, trace black carbonaceous specks, trace micromica, firm, very dispersive, non fissile.

Interbedded and laminated with:

SANDSTONE: (40%) light grey, very fine to coarse, dominantly fine to medium, subangular to subrounded, moderately to well sorted, weak silica and calcareous cements, common to abundant off white argillaceous matrix, clear to opaque quartz grains, abundant altered feldspar grains, common to abundant green grey brown and yellow orange lithics, common clear to brown mica flakes, trace black coaly detritus, common to abundant pyrite, friable, poor visual porosity, no oil fluorescence.

345 - 356 meters

SANDSTONE: (100%) light brown, very fine to medium, dominantly fine, subangular to subrounded, moderately to well sorted, no apparent cement, trace light brownish white argillaceous matrix, clear to opaque quartz grains, common white to orange brown altered feldspar grains, common green grey brown yellow orange and red lithics, trace clear to brown mica flakes, trace black coaly detritus, trace pyrite, unconsolidated, good visual porosity, no oil fluorescence.

With minor interbedded:

CLAYSTONE: very dark grey to black, very carbonaceous, moderately silty, non calcareous, trace micromica, firm, non fissile.

356 - 417 meters

CLAYSTONE: (100%) medium brown grey to very dark grey, rarely off white to light brown grey, moderately silty, trace black coaly detritus, trace micromica, soft, sticky, non fissile.

With minor laminae in part of:

SANDSTONE: (trace) light brown, very fine to coarse, dominantly fine, subangular to subrounded, moderately sorted, very weak silica cement, common brownish white argillaceous matrix, clear to opaque quartz grains, common white to orange brown altered feldspar grains, common green grey brown yellow orange and red lithics, trace clear to brown mica flakes, trace black coaly detritus, friable, poor inferred porosity, no oil fluorescence.

417 - 449 meters

CLAYSTONE: (100%) light to medium grey, light to medium orange brown mustard yellow to red brown - occasionally mottled, moderately silty, rarely slightly calcareous, trace very fine sandstone laminae with common lithics and altered feldspar grains, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.

449 - 453 meters

SANDSTONE: (100%) light brown grey, very fine to coarse, dominantly fine to medium, subangular to subrounded, poor to moderate sorting, weak to strong calcareous cement, common to abundant white argillaceous matrix, clear to milky quartz grains, abundant altered feldspar grains, common green grey and red lithics, trace black carbonaceous material, rare brown mica flakes, trace pyrite, friable, poor visual porosity, no oil fluorescence.

453 - 481 meters

CLAYSTONE: (100%) light to medium grey, medium green, light to medium orange brown mustard yellow to red brown, moderately silty, rarely slightly calcareous, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.

STRZELECKI FORMATION (481 - 825+ meters)

481 - 576 meters

SANDSTONE: (80%) off white to light grey, becoming light greenish grey with depth, very fine to medium, dominantly fine, subangular to subrounded, moderately sorted, moderate calcareous cement at top decreasing to occasional weak calcareous cement with depth, abundant white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, friable, very poor visual porosity, no oil fluorescence.

Laminated and finely interbedded with:

CLAYSTONE: (20%) off white to medium grey to medium brown grey, occasionally light grey to light green grey, minor red brown at top, moderately silty, slightly calcareous in part, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.

576 - 720 meters

SANDSTONE: (50%) off white to medium greenish grey, very fine to rarely medium, dominantly fine, subangular to subrounded, moderately sorted, weak calcareous cement, abundant white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence.

Finely interbedded and laminated with and grading to:

CLAYSTONE: (50%) off white to medium grey to medium brown grey to medium green grey, moderately silty, rarely slightly calcareous, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.

720 - 777 meters

SANDSTONE: (80%) off white to medium greenish grey, very fine to occasionally medium, dominantly fine, subangular to subrounded, moderately sorted, weak to occasionally moderate calcareous cement, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence.

Finely interbedded and laminated with and grading to:

CLAYSTONE: (20%) off white to medium grey to medium green grey, medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile.

777 - 808 meters

CLAYSTONE: (80%) off white to light green grey to light brown grey, slightly silty, trace black coaly detritus and carbonaceous specks, trace micromica, non fissile.

Finely interbedded and laminated with:

SANDSTONE: (20%) off white to medium green grey, very fine to fine, very silty in part, subangular to subrounded, moderately sorted, weak calcareous cement in part, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace mica flakes, friable, very poor visual porosity, no oil fluorescence.

808 - 825 meters

SANDSTONE: off white to medium green grey, very fine to fine, dominantly fine, subangular to subrounded, moderately sorted, occasional weak calcareous cement, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace mica flakes, friable, very poor visual porosity, no oil fluorescence.

Finely interbedded and laminated with minor:

CLAYSTONE: off white to medium grey to medium green grey to medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile.

4.0 DISCUSSION AND CONCLUSIONS

Palynological dating by Dr. A. Partridge (Appendix 2) has been used to assist in selecting Formation picks. Five cuttings samples and one core sample were submitted for dating. The dates assigned confirm the presence of a Middle Eocene-Palaeocene age section (Latrobe Group) unconformably overlying Turonian age sediments of the lowermost section of the Golden Beach Group (Emperor Sub-Group), which in turn overly the Early Cretaceous age Strzelecki Formation.

Protea No.1 intersected a Gippsland Basin section in which the surface Quaternary Gravels were directly underlain by the Latrobe Group. This indicates that the Gippsland Limestone, Lakes Entrance Formation and the upper portion of the Latrobe Group had been eroded at this location, reflecting the effect of Tertiary structuring.

The Latrobe Group sands showed excellent reservoir potential, with clean coarse grained sands: however no hydrocarbon generation or migration was observed throughout this Group.

The Golden Beach Formation was encountered 272 meters low to prognosis, resulting in a far thicker section of Latrobe Group sediments being present than previously thought. This can probably be attributed to the poor quality of the available seismic and lack of adequate velocity and well control.

However, as interpreted, the Golden Beach Formation is present from 323 to 481 metres. It consisted of interbedded claystone and sandstone, the latter exhibiting reasonable reservoir quality. No hydrocarbon shows were recorded.

The thickness of Golden Beach Formation section encountered, (158 m), indicates there is rapid thinning, (probably fault controlled), between Protea-1 and Boundary Creek-1A, located 1.2 km to the west, which has Latrobe Formation unconformably overlying Strzelecki Formation. (refer Figures 2B, 3).

Protea-1 and Boundary Creek1A have thus tied down the western pinch-out edge of the Golden Beach Formation in this vicinity, and demonstrated the presence of reservoir quality sands within the Late Cretaceous age Golden Beach Group.

5.0 COMPLETION

913672 028

Protea No.1 was plugged and abandoned.

913672 029

Appendix 1

Appendix 1

**MANILLA
WHITE DIVIDERS**
5 TAB A4



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APPENDIX 1

DAILY GEOLOGICAL REPORTS

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 1****Date: 03-06-2002****Depth: 8.5m****Progress:8.5m****Days from Spud: 1**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m		
Drilling Rep:	Wally Westman	RT: (datum)	51m		
Geologist:	J. Mulready	Last Casing:		at	m

Comments:

Spud Protea No.1 at 0730 hrs on the 3rd of June, 2002, drill to 8.5m, set 9.625" conductor at 8.4m, nipple up and function test BOP's.

Interval (mRT)	Hydrocarbon Show Summary	Gas
Spud-8.5	No show	0

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4			
Lakes Entrance Formation	60			
LaTrobe Group	72			
Golden Beach Formation	122			
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
Spud-8.5	SANDSTONE: (100%) orange brown, fine to medium, subangular, clear and orange quartz grains in a sparse argillaceous and calcareous matrix, friable - often with loose grains in sample, no oil fluorescence.

913672 032

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 2****Date: 04-06-2002****Depth: 128m****Progress:120m****Days from Spud: 2****Rig:** Sides Bourne 2000THD**GL(AHD):** 50m**Drilling Rep:** Wally Westman**RT: (datum)** 51m**Geologist:** J. Mulready**Last Casing:** 9.625 at 8.4m**Comments:**

Drill 8.5" hole from 8.4 to 128m.

Interval (mRT)	Hydrocarbon Show Summary	Gas
8.4-128	No show	0-3 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122			
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
8.4-13	SANDSTONE: (95%) light grey, minor orange brown as for spud-5m, quartzose, medium to coarse grained, subangular, calcareous in part, loose grains, no oil fluorescence. With minor SANDSTONE: (5%) orange brown, fine to medium, subangular, clear and orange quartz grains in a sparse argillaceous and calcareous matrix, friable - often with loose grains in sample, no oil fluorescence.

13-128	<p>SAND: (90%) loose grains, light grey, fine to coarse, subangular, clear to light grey, occasionally white, well sorted, no oil fluorescence.</p> <p>In general becoming coarser with depth and grading to to:</p> <p>SAND: light grey, clear, white, very coarse grained to pebbly, subangular to subrounded, no oil fluorescence.</p> <p>Interbedded with:</p> <p>COAL: (10%) grey black, soft.</p>
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LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 3****Date: 05-06-2002****Depth: 281m****Progress:153m****Days from Spud: 3**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	9.625 at 8.4m

Comments:

RIH, trip gas at 128m 0 units, no fill. Drill 8.5" hole 128 to 281m.

Interval (mRT)	Hydrocarbon Show Summary	Gas
128-212	No show	2-3 units
212-222	No show	2-3 units
222-281	No show	2-3 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122			
Strzelecki Formation	187			
Total Depth	600			

Provisional, based on mudlog*Lithological and Fluorescence Description**

Interval (m)	Description
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128-145	<p>COAL: (70%) dark orange brown to very dark brown to rarely black, irregular to blocky fracture rarely fibrous, earthy texture and lustre, often very argillaceous, rare amber, moderately hard. Interbedded with</p> <p>SANDSTONE: (30%) very light grey, very fine to grit, dominantly coarse, angular to subrounded, dominantly subangular, poor to moderate sorting, weak to moderate silica cement, trace dark grey argillaceous matrix, clear to opaque quartz grains, rare grey green and orange brown lithics, trace to common black coaly detritus, trace to common coarse mica flakes, trace pyrite, friable, fair to very good inferred porosity, no oil fluorescence.</p>
145-212	<p>SANDSTONE: (100%) very light grey, very fine to pebble, dominantly very coarse - in general becoming coarse with depth, angular to subrounded, dominantly subangular, poor to moderate sorting, weak silica cement, trace off white argillaceous matrix, clear to opaque quartz grains, trace grey green lithics, trace black coaly detritus, trace coarse mica flakes, trace pyrite, friable to unconsolidated, very good inferred porosity, no oil fluorescence.</p> <p>With minor detrital and thinly interbedded:</p> <p>COAL: (Trace) very dark brown to dominantly black, irregular to blocky fracture, earthy texture and lustre, very argillaceous in part, moderately hard.</p>
212-222	<p>Massive Claystone:</p> <p>CLAYSTONE: (100%) off white to very pale brownish white, (kaolinitic?), very soft, sticky, amorphous.</p>
222-281	<p>Massive Sandstone:</p> <p>SANDSTONE: (100%) very light grey, very fine to pebble, dominantly very coarse, angular to subrounded, dominantly subangular, poorly sorted, weak silica cement, trace to rarely common off white argillaceous matrix, clear to opaque quartz grains, trace grey green lithics, trace coarse mica flakes, trace black coaly detritus, rare pyrite, friable, very good inferred porosity, no oil fluorescence.</p>

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 4****Date: 06-06-2002****Depth: 345m****Progress:64m****Days from Spud: 4**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	9.625 at 8.4m

Comments:

RIH, trip gas at 281m = 2 units, 6m fill. Drill 8.5" hole 281 to 345m, POOH to run 7" casing.

Carbide test at 320m = 39 units.

Top pick for Golden Beach Formation is tentative and may be subject to change after more section has been penetrated.

Interval (mRT)	Hydrocarbon Show Summary	Gas
281-345	No show	1-3 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122	323	+272	201 Low
Strzelecki Formation	187			
Total Depth	600			

Provisional, based on mudlog*Lithological and Fluorescence Description**

Interval (m)	Description
281-318	Massive Sandstone: SANDSTONE: (100%) very light grey, very fine to pebble, dominantly very coarse to grit, angular to subrounded, dominantly subangular, moderately sorted, weak silica cement, trace off white argillaceous matrix, clear to opaque quartz grains, trace grey green and rare orange red lithics, trace coarse clear mica flakes, trace black coaly detritus, friable, very good inferred porosity, no oil fluorescence.

318-323	<p>CLAYSTONE: (40%) off white to medium grey, trace black carbonaceous specks, trace micromica, soft, sticky, amorphous.</p> <p>Grading to and interbedded with:</p> <p>SANDSTONE: (60%) light grey, very fine to pebble, dominantly very coarse, angular to subrounded, dominantly subangular, poorly sorted, weak silica cement, abundant off white to medium grey argillaceous matrix, clear to milky quartz grains, trace grey green lithics, trace black coaly detritus, common to abundant pyrite, friable, good inferred porosity, no oil fluorescence.</p>
323-345	<p>CLAYSTONE: (60%) medium grey, slightly silty, trace black carbonaceous specks, trace micromica, firm, very dispersive, non fissile.</p> <p>Interbedded and laminated with:</p> <p>SANDSTONE: (40%) light grey, very fine to coarse, dominantly fine to medium, subangular to subrounded, moderately to well sorted, weak silica and calcareous cements, common to abundant off white argillaceous matrix, clear to opaque quartz grains, abundant altered feldspar grains, common to abundant green grey brown and yellow orange lithics, common clear to brown mica flakes, trace black coaly detritus, common to abundant pyrite, friable, poor visual porosity, no oil fluorescence.</p>

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 5****Date: 07-06-2002****Depth: 345m****Progress:0m****Days from Spud: 5****Rig:** Sides Bourne 2000THD**GL(AHD):** 50m**Drilling Rep:** Wally Westman**RT: (datum)** 51m**Geologist:** David Horner**Last Casing:** 9.625 at 8.4m**Comments:**

RIH with 7" casing - could not circulate. RIH with drill pipe - restore circulation.

Interval (mRT)	Hydrocarbon Show Summary	Gas
	No new formation drilled	

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122	323	+272	201 Low
Strzelecki Formation	187			
Total Depth	600			

Provisional, based on mudlog*Lithological and Fluorescence Description**

Interval (m)	Description
	No new formation drilled

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 6****Date: 08-06-2002****Depth: 349.5m****Progress:4.5m****Days from Spud: 6**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

POOH with drill string, cement 7" casing at 338m, RIH with 6.125" drilling assembly, drill ahead 345 to 349.5m, circulate sample, preform PIT, POOH for core #1.

Interval (mRT)	Hydrocarbon Show Summary	Gas
345-349.5	No show	3-4 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122	323	+272	201 Low
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
345-349.5	SANDSTONE: (100%) light brownish grey, very fine to medium, dominantly fine, subangular to subrounded, moderately to well sorted, weak silica and calcareous cements, common to abundant off white argillaceous matrix, clear to opaque quartz grains, abundant altered feldspar grains, abundant green grey brown and yellow orange lithics, common clear to brown mica flakes, common black coaly detritus, trace pyrite, friable, poor visual porosity, no oil fluorescence.

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 7****Date: 09-06-2002****Depth: 356m****Progress: 6.5m****Days from Spud: 7**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

POOH with drill string, Pick up and RIH with core barrel. Cut core #1 349.5-356.0 (6.5m), well flowing fresh water, POOH to shoe, kill well, condition mud, POOH, inner barrel jammed, lay down core barrel, RIH with 6.125" drilling assembly - core not yet retrieved.

Interval (mRT)	Hydrocarbon Show Summary	Gas
349.5-356	No show - Gas peak 354-355m of 9 units whilst well flowing water.	3-5 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	+38	59 High
Golden Beach Formation	122	323	+272	201 Low
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
349.5-356	SANDSTONE: (100%) light brown, very fine to medium, dominantly fine, subangular to subrounded, moderately to well sorted, no apparent cement, trace light brownish white argillaceous matrix, clear to opaque quartz grains, common white to orange brown altered feldspar grains, common green grey brown yellow orange and red lithics, trace clear to brown mica flakes, trace black coaly detritus, trace pyrite, unconsolidated, good visual porosity, no oil fluorescence.

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 8****Date: 10-06-2002****Depth: 356m****Progress:0m****Days from Spud: 8**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

RIH with 6.125" drilling assembly, 115m fill, ream fill to 283m, POOH to unblock bit jets. Well flowing fresh water at 8.9 lb/gal mud weight, losing circulation at 9.1 lb/gal mud weight. RIH open ended, wash to bottom, set cement plug below shoe. Background gas whilst reaming 1-3 units.

Recover Core #1 349.5 to 356.0 meters (cut 6.5m, Rec 349.5-350.3m (0.8m) 12%)

Interval (mRT)	Hydrocarbon Show Summary	Gas
	No new formation drilled	

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation				
Total Depth				

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
	No new formation drilled.

CORE No.1 349.5-356.0m	<p>Core #1 349.5 to 356.0 meters (cut 6.5m, Rec 349.5-350.3m (0.8m) 12%)</p> <p>Well began flowing fresh water and sand whilst coring.</p> <p>349.5 - 350.3m</p> <p>CLAYSTONE: very dark grey to black, very carbonaceous, moderately silty, non calcareous, trace micromica, firm, non fissile.</p> <p>350.3 - 356.0m.</p> <p>No recovery (lost section assumed to be from bottom of core - not necessarily correct).</p> <p>No visible sedimentary structure, tectonic structure or bedding.</p> <p>Drill rates: 349.5-350.5 = 8 min/m. 350.5-351.5 = 12 min/m. 351.5-352.5 = 12 min/m. 352.5-353.5 = 13.5 min/m. 353.5-354.5 = 16 min/m. 354.5-355.5 = 12.5 min/m. 355.5-356.0 = 11 min/m.</p> <p>Gas whilst coring: 3-5 units, peak at 354-355m = 9 units.</p>
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LAKES PETROLEUM N.L.

(A.C.N. 004247214)

913672 043**PROTEA No.1 PEP 157****DAILY GEOLOGICAL REPORT No. 9****Date: 11-06-2002****Depth: 485m****Progress: 129m****Days from Spud: 9****Rig:** Sides Bourne 2000THD**GL(AHD):** 50m**Drilling Rep:** Wally Westman**RT: (datum)** 51m**Geologist:** David Horner**Last Casing:** 7" at 338m**Comments:**

RIH with 6.125" drilling assembly, drill out cement plug, ream to bottom, drill ahead 356-485m.

Carbide at 456m = 80 units.

Interval (mRT)	Hydrocarbon Show Summary	Gas
356-417	No show	2-3 units
417-485	No show	2-5 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation				
Total Depth				

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
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356-417	<p>CLAYSTONE: (100%) medium brown grey to very dark grey, rarely off white to light brown grey, moderately silty, trace black coaly detritus, trace micromica, soft, sticky, non fissile. With minor laminae in part of:</p> <p>SANDSTONE: (trace) light brown, very fine to coarse, dominantly fine, subangular to subrounded, moderately sorted, very weak silica cement, common brownish white argillaceous matrix, clear to opaque quartz grains, common white to orange brown altered feldspar grains, common green grey brown yellow orange and red lithics, trace clear to brown mica flakes, trace black coaly detritus, friable, poor inferred porosity, no oil fluorescence.</p>
417-449	<p>Massive Claystone.</p> <p>CLAYSTONE: (100%) light to medium grey, light to medium orange brown mustard yellow to red brown - occasionally mottled, moderately silty, rarely slightly calcareous, trace very fine sandstone laminae with common lithics and altered feldspar grains, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.</p>
449-453	<p>Sandstone interbed:</p> <p>SANDSTONE: (100%) light brown grey, very fine to coarse, dominantly fine to medium, subangular to subrounded, poor to moderate sorting, weak to strong calcareous cement, common to abundant white argillaceous matrix, clear to milky quartz grains, abundant altered feldspar grains, common green grey and red lithics, trace black carbonaceous material, rare brown mica flakes, trace pyrite, friable, poor visual porosity, no oil fluorescence.</p>
453-481	<p>Massive Claystone</p> <p>CLAYSTONE: (100%) light to medium grey, medium green, light to medium orange brown mustard yellow to red brown, moderately silty, rarely slightly calcareous, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.</p>
481-485	<p>Sandstone unit:</p> <p>SANDSTONE: (100%) light brownish grey, very fine to coarse, dominantly fine to medium, subangular to subrounded, poor to moderate sorting, weak calcareous and silica cements, abundant white argillaceous matrix, clear to milky quartz grains, abundant altered feldspar grains, common to abundant green grey and red lithics, trace black carbonaceous material, trace brown and green mica flakes, trace pyrite, friable, very poor visual porosity, no oil fluorescence.</p>

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 10****Date: 12-06-2002****Depth: 609m****Progress: 124m****Days from Spud: 10**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

RIH with 6.125" drilling assembly, trip gas 15 units drill ahead 485-609m.

Interval (mRT)	Hydrocarbon Show Summary	Gas
485-606	No show	2-6 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation				
Total Depth				

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
485-576	<p>SANDSTONE: (80%) off white to light grey, becoming light greenish grey with depth, very fine to medium, dominantly fine, subangular to subrounded, moderately sorted, moderate calcareous cement at top decreasing to occasional weak calcareous cement with depth, abundant white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, friable, very poor visual porosity, no oil fluorescence.</p> <p>Laminated and finely interbedded with:</p> <p>CLAYSTONE: (20%) off white to medium grey to medium brown grey, occasionally light grey to light green grey, minor red brown at top, moderately silty, slightly calcareous in part, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.</p>

576-606	<p>SANDSTONE: (70%) off white to greenish grey, very fine to medium, dominantly fine to medium, subangular to subrounded, moderately sorted, moderate calcareous cement, abundant white argillaceous matrix, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence.</p> <p>Laminated and finely interbedded with:</p> <p>CLAYSTONE: (30%) light to medium grey to medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.</p>
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913672 047

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 11****Date: 13-06-2002****Depth: 609m****Progress:0m****Days from Spud: 11**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

Wait on rig repairs.

Interval (mRT)	Hydrocarbon Show Summary	Gas
	No new formation drilled	

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation				
Total Depth				

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
	No new formation drilled.

913672 048

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 12****Date: 14-06-2002****Depth: 609m****Progress:0m****Days from Spud: 12**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

Wait on rig repairs.

Interval (mRT)	Hydrocarbon Show Summary	Gas
	No new formation drilled	

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation				
Total Depth				

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
	No new formation drilled.

913672 049

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 13****Date: 15-06-2002****Depth: 720m****Progress: 111m****Days from Spud: 13**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

Finish rig repairs, condition mud, RIH and drill ahead 609-720m. Trip gas 12 units.
 Sample from 606m has been dated as C.Paradoxa zone of Strzelecki Formation.
 Carbide at 666m = 33 units.

Interval (mRT)	Hydrocarbon Show Summary	Gas
606-720	No show	2-4 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
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606-720	<p>SANDSTONE: (50%) off white to medium greenish grey, very fine to rarely medium, dominantly fine, subangular to subrounded, moderately sorted, weak calcareous cement, abundant white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence.</p> <p>Finely interbedded and laminated with and grading to:</p> <p>CLAYSTONE: (50%) off white to medium grey to medium brown grey to medium green grey, moderately silty, rarely slightly calcareous, trace black coaly detritus and carbonaceous flecks, trace micromica, firm, non fissile.</p>
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LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 14****Date: 16-06-2002****Depth: 752m****Progress:32m****Days from Spud: 14**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

POOH for new bit, RIH. Hole bridged at 450m, ream tight hole from 475m to bottom. Drill ahead 720-752m. Trip gas 2 units.

Interval (mRT)	Hydrocarbon Show Summary	Gas
720-752	No show	3 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation	187			
Total Depth	600			

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
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720-752	<p>SANDSTONE: (80%) off white to medium greenish grey, very fine to occasionally medium, dominantly fine, subangular to subrounded, moderately sorted, weak to occasionally moderate calcareous cement, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence.</p> <p>Finely interbedded and laminated with and grading to:</p> <p>CLAYSTONE: (20%) off white to medium grey to medium green grey, medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile.</p>
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LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 15****Date: 17-06-2002****Depth: 800m****Progress:48m****Days from Spud: 15**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Wally Westman	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

RIH. Trip gas at 752m = 2 units. Hole tight on trip in. Drill ahead 752-800m.

Carbide at 796m = 50 units.

Interval (mRT)	Hydrocarbon Show Summary	Gas
752-800	No show	3 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation	187			
Total Depth	600			

Provisional, based on mudlog*Lithological and Fluorescence Description**

Interval (m)	Description
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752-777	<p>SANDSTONE: (90%) off white to medium greenish grey, very fine to medium, dominantly fine, subangular to subrounded, moderately sorted, weak to occasionally moderate calcareous cement, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace brown mica flakes, friable, very poor visual porosity, no oil fluorescence. With minor finely interbedded and laminated:</p> <p>CLAYSTONE: (10%) off white to medium grey to medium green grey, occasionally medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile.</p>
777-800	<p>CLAYSTONE: (80%) off white to light green grey to light brown grey, slightly silty, trace black coaly detritus and carbonaceous specks, trace micromica, non fissile. Finely interbedded and laminated with:</p> <p>SANDSTONE: (20%) off white to medium green grey, very fine to fine, very silty in part, subangular to subrounded, moderately sorted, weak calcareous cement in part, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace mica flakes, friable, very poor visual porosity, no oil fluorescence.</p>

LAKES PETROLEUM N.L.

(A.C.N. 004247214)

PROTEA No.1 PEP 157**DAILY GEOLOGICAL REPORT No. 16****Date: 18-06-2002****Depth: 825m****Progress:25m****Days from Spud: 16**

Rig:	Sides Bourne 2000THD	GL(AHD):	50m
Drilling Rep:	Kevin Boatwood	RT: (datum)	51m
Geologist:	David Horner	Last Casing:	7" at 338m

Comments:

RIH. Trip gas at 800m = 13 units. Hole tight on trip in. Drill ahead 800-825m. (T.D. - reached at 10:50 hrs 18-6-02). POOH to log. Run #1 DT-GR-FMI (778-338m), GR 338-surface. (Hole bridged at 778m).

Interval (mRT)	Hydrocarbon Show Summary	Gas
800-825	No show	6-8 units

Formation Tops:	Prognosed (mRT)	Actual* (mRT)	Actual* (mSS)	Difference* (High/Low)
Quaternary Gravel	Surface	Surface	+50	0
Gippsland Limestone	4	n/p	-	-
Lakes Entrance Formation	60	n/p	-	-
LaTrobe Group	72	13	-38	59 High
Golden Beach Formation	122	323	-272	201 Low
Strzelecki Formation	187	481	-431	294 Low
Total Depth	600	825	-775	225 Low

*Provisional, based on mudlog

Lithological and Fluorescence Description

Interval (m)	Description
800-808	<p>CLAYSTONE: (90%) off white to medium green grey to medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile. With minor finely interbedded and laminated:</p> <p>SANDSTONE: (10%) off white to medium green grey, very fine to fine, very silty in part, subangular to subrounded, moderately sorted, weak calcareous cement in part, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace mica flakes, friable, very poor visual porosity, no oil fluorescence.</p>

808-825	<p>SANDSTONE: off white to medium green grey, very fine to fine, dominantly fine, subangular to subrounded, moderately sorted, occasional weak calcareous cement, abundant off white argillaceous matrix - matrix supported, minor quartz grains, abundant altered feldspar grains, abundant green grey lithics, trace brown to red lithics, trace black carbonaceous material, trace mica flakes, friable, very poor visual porosity, no oil fluorescence.</p> <p>Finely interbedded and laminated with minor:</p> <p>CLAYSTONE: off white to medium grey to medium green grey to medium brown grey, moderately silty, rarely slightly calcareous, trace black coaly detritus, trace micromica, firm, non fissile.</p>
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Appendix 2

913672 058

APPENDIX 2

PALYNOLOGY REPORT

By
Dr Alan D. Partidge

Biostrata Pty Ltd

Palynological analysis of core and cuttings samples in Protea-1, onshore Gippsland Basin.

by Alan D. Partridge

INTERPRETATIVE DATA

Summary

Five cuttings and one core sample have been analysed over a 264 metre interval between 342 and 606m in the Protea-1 exploration well located on the Baragwanath Anticline in the onshore Gippsland Basin. The palynomorph assemblages recovered from the shallower four samples are assigned to the early Turonian age *Hoegisporis trinalis* Subzone of the *Phyllocladidites mawsonii* spore-pollen Zone, and are diagnostic of the Emperor Subgroup (formerly the lower part of the Golden Beach Group). The two deepest cuttings samples contain assemblages that belong to the Late Albian age Upper *Coptospora paradoxa* spore-pollen Zone and are diagnostic of the Strzelecki Group.

Caved Tertiary spore-pollen from the overlying Latrobe Group dominate the shallowest cuttings (>80% of count) and are a minor component of all the deeper cuttings (<10% of count). In addition, palynomorphs caved from the Emperor Subgroup are a significant component (~25%) in the two bottom cuttings samples from the Strzelecki Group.

Aside from the badly contaminated shallowest cuttings the Turonian assemblage also contain frequent non-marine microplankton (average 6%) that are assigned to the *Rimosicysta* microplankton Superzone. The associated spore-pollen are dominated by the gymnosperm pollen *Dilwynites* and *Araucariacites* which combined average >35% of the spore-pollen counts, and are interpreted to represent a strong Neves effect. The combination of both these features indicate the shales sampled were deposited in distal lacustrine environments. Similar features are characteristic of the Kipper Shale suggesting a likely correlation.

The caved Tertiary spore-pollen indicate of that both Paleocene and Middle and Late Eocene sediments occur at shallower depths in the well. This caved component is dominated by *Nothofagidites* pollen characteristic of the Eocene Lower and Middle *N. asperus* Zones, whereas indicator species for the Paleocene *L. balmei* Zone are extremely rare. These zones and ages indicate that sediments representative of the Burong and Barracouta or Yarram Formations occur at shallower depths in the well.

Introduction

The five cuttings and one core sample from the Protea-1 well drilled by Lakes Oil N.L. were submitted for a mixture of urgent and routine analysis between the 6th to 18th June 2002, with the objective of confirming the penetration initially of the Golden Beach Group (as used in the sense of Lowry & Longley, 1991), and once this was found to confirm the penetration and location of the top of the older Strzelecki Group. All samples were forwarded directly to Laola Pty Ltd in Perth for processing and slide preparation and the latter were returned to the author for microscope analysis between the 11th and 27th June. A series of four Provisional Reports on the initial results were then submitted between the 11th and 29th June 2002.

The zones and ages assigned to the samples, zone confident ratings, microplankton abundances and zone identification criteria for each of the samples are summarised on Table 1. All the samples gave moderate to high organic residue yields which contained mostly moderate to high concentrations of palynomorphs whose preservation was mostly poor to fair (Table 2). Recorded diversity of the

spore-pollen assemblages was high at an average of 41+ species per sample, whereas the microplankton assemblages have a low diversity of 4+ species per sample. The species recorded during the microscope examination are listed in Table 3 and 4. Author citations for most of the recorded spore-pollen species can be sourced from the papers by Dettmann (1963, 1986), Helby *et al.* (1987) or Stover & Partridge (1973, 1982), while the author citations for the microplankton species can be sourced from the indexes for dinocysts and other organic-walled microplankton prepared by Fensome *et al.* (1990) and Williams *et al.* (1998). Informal manuscript species are distinguished by the addition of "ms" or "†" to the binomial names.

Geological Discussion

The bottom ~270 metres of section penetrated in Protea-1 comprises about 150 metres of the Emperor Subgroup overlying 120+ metres of the Strzelecki Group. The Emperor Subgroup erected by Partridge (1999) and summarised in Bernecker & Partridge (2001) is the oldest of four subgroups proposed within the siliciclastic Latrobe Group. It represents the lower part of the broader Golden Beach Group proposed by Lowry & Longley (1991). In the new scheme the latter name is restricted to the upper part of the former group, and reduced in rank to the Golden Beach Subgroup (Bernecker & Partridge, 2001). Diagnostic palynomorphs of the *N. senectus* and *T. apoxyexinus* Zones which are restricted to the Golden Beach Subgroup were not found in Protea-1 and hence this younger subgroup is deemed to be absent.

Recognition of the *P. mawsonii* Zone and hence the Emperor Subgroup in the shallowest cuttings in Protea-1 was initially uncertain because of the extensive downhole caving of Eocene and Paleocene palynomorphs. However, once the core sample was assigned to the *H. trinalis* Subzone, the cuttings sample only eight metres shallower could confidently be assigned to the same zone.

The *H. trinalis* Subzone is the oldest defined subzone of the *P. mawsonii* Zone and is the oldest known zone or subzone to overlie the Strzelecki Group in the Gippsland Basin. Dutson Downs-1 and Leatherjacket-1 are the only other wells in the Gippsland Basin where it is known that the unconformity between the Emperor Subgroup and Strzelecki Group has been penetrated. In all other wells where these two units are juxtaposed, such as Emperor-1 and Longtom-1, the boundary is interpreted to be faulted (Partridge, 1999). Missing at the unconformity in Protea-1 are the latest Albian *P. pannosus* and Cenomanian *H. uniforma* Zones representing a time interval of 8 to 10 million years (Partridge, 2001; fig.2).

As with many other sections of the Emperor Subgroup the palynological assemblages recovered in Protea-1 contain non-marine organic-walled microplankton (algal cysts, acritarchs and dinocysts) and spore-pollen assemblages with high abundances of *Dilwynites* pollen. The skewed distribution of the latter are interpreted as Neves effects, which is the tendency for certain more buoyant spores or pollen to have greater relative abundances in sediments deposited in more distal marine or lacustrine environments (Traverse, 1988; Partridge, 1999). The combined occurrence of both non-marine microplankton and Neves effects in the same samples is interpreted to represent a lacustrine environment of deposition, which is certainly distal and possibly also deep-water. On the currently established stratigraphy this environment in Protea-1 is interpreted as tongues of Kipper Shale expanding geographically into the Admiral or Curlip Formations on the margins of the basin, during periods of maximum lake level (Bernecker & Partridge, 2001; fig.10a).

Caved spore-pollen in the cuttings samples also provide information of the section penetrated above the Cretaceous Emperor Subgroup. The identification of spore pollen of both the Paleocene *L. balmei* Zone and younger Eocene Lower to Middle *N. asperus* Zones indicates the presence of stratigraphic section equivalent to the Barracouta or Yarram Formations and younger Burong Formation (Partridge, 1999).

Biostratigraphy

Nothofagidites asperus spore-pollen Zone

Caved between 342 and 606m metres

Age: Middle to Late Eocene.

More than 80% of the palynomorphs recorded from the shallowest cuttings sample and between 5% and 10% of the palynomorphs recorded from the deeper cuttings are comprised of spore-pollen species caved from the Middle to Late Eocene portion of the Latrobe Group. In the shallowest cuttings (the only sample with a reliable count) this component of the assemblage is dominated by *Nothofagidites* pollen (24%), *Haloragacidites harrisii* pollen (13%) and the gymnosperm pollen *Phyllocladidites mawsonii* (22%). Based on the presence of the index species *Nothofagidites falcatus*, *Proteacidites pachypolus*, *P. reflexus* and *Tricolporites leuros*, and lack of definitive younger species, the bulk of the caved fossils are interpreted to come from the Lower *N. asperus* Zone (as redefined by Stover & Partridge, 1982). The deeper cutting contain fewer index species but are still consistent with this interpretation. The section from which the palynomorphs have caved belongs to the Burong Formation of Partridge (1999) and Bernecker & Partridge (2001; fig.2).

Lygistepollenites balmei spore-pollen Zone

Caved at 342 and 606m metres

Age: Paleocene.

The presence of very rare caved specimens of *Lygistepollenites balmei* in the shallowest and deepest cuttings samples is interpreted to indicate that sediments belonging in to the *L. balmei* Zone have been penetrated in the Protea-1 well. This Paleocene stratigraphic interval is interpreted to belong to either the Barracouta or Yarram Formations (Partridge, 1999).

Hoegisporis trinalis Subzone of *Phyllocladidites mawsonii* spore-pollen Zone

Interval: 342 to 471 metres.

Age: early Turonian.

The *Hoegisporis trinalis* Subzone was erected as the oldest subzone of the *P. mawsonii* Zone in the Otway Basin where it is extensively documented from the lower part of the Waarre Formation (Partridge, 1999, 2001). In the Gippsland Basin the key index species defining the subzone has previously been recorded in Admiral-1, Emperor-1 and Longtom-1 (Partridge, 1990, 1993, 1995). The presence of the subzone in Protea-1 represents the westernmost known occurrence of this zone in the Gippsland Basin. The subzone is identified in the core sample at 350.3m and the cuttings at 402m and 471m based on the occurrence of the eponymous species *Hoegisporis trinalis* ms, which does not range above the subzone, associated with the secondary species *Laevigatosporites musa* ms and *Verrucosiporites admirabilis* ms, which are not known to range below this subzone. Other distinctive species in the assemblage are *Appendicisporites distocarinatus* (only at 402m) and *Coptospora pileolus* ms, although both these forms do extent into younger zones. Finally, the occurrence of *Tricolporites variverrucatus* ms at 402m is considered atypical as this species generally has it oldest occurrence in the next younger *Laevigatosporites musa* Subzone. Note also that the index species *H. trinalis* has caved into the older *C. paradoxa* Zone assemblages at 519m and 606m

The eponymous species for the parent *P. mawsonii* Zone was not recorded from the core sample, and all specimens recorded from the cuttings are considered to be caved from the overlying Eocene. Notwithstanding this absence the gross composition of the assemblages are consistent with the identification of the broad *P. mawsonii* Zone in the Gippsland Basin. The assemblages are dominated by gymnosperm pollen (average >80%), principally the categories *Dilwynites* spp. (average >30%), *Podocarpidites* spp. (average 13%) and *Araucariacites australis* (average 6%).

Most variable of the gymnosperm pollen are the abundances recorded for *Cupressacites* sp. which range from 5% in the cuttings at 471m to >45% in the core sample. The latter exceptionally high abundance is also anomalous compared to all previous studies, because abundances of *Cupressacites* pollen >10% have never before been recorded from the *H. trinalis* Subzone. In previous studies increases in the abundance of *Cupressacites* has been used to differentiate the middle to upper part of the *P. mawsonii* Zone in the absence of the generally rare index species. Such was the case in Deadman Hill-1 where an abundance of *Cupressacites* pollen of >20% in the shallower core and cuttings samples was used to argue the case for correlating that section to the spike in *Cupressacites* pollen abundance recorded near the top of the *Gleicheniidites ancorus* Subzone in the Otway Basin (Partridge, 2002). The subsequent breakdown of this criteria in Protea-1 would now challenge that correlation. Notwithstanding this unresolved problem the section assigned to the *P. mawsonii* Zone in Deadman Hill-1 is considered to be younger than the section in Protea-1 based on the absence of *Hoegisporis trinalis* ms and associated index species. In my opinion the samples analysed in Deadman Hill-1 were of sufficient quality that if the critical index species were present they would have been found and recorded.

The shallowest cuttings lacks the key index species but is still assigned to the broad *P. mawsonii* Zone based on the dominance of *Dihwynites* and *Cupressacites* pollen. The *in situ* Turonian palynomorphs are distinguished from the caved Eocene pollen that dominated the assemblage by their darker colour, a consequence of their higher maturation.

***Rimosicysta* microplankton Superzone**

Interval: 350.3 to 471 metres.

Age: Turonian.

The *Rimosicysta* Superzone is the name given to the unusual suite of algal cysts described from the Kipper Shale by Marshall (1989). The association is represented in Protea-1 by the distinctive algae cysts *Rimosicysta kipperii* and *Wuroia corrugata* and *W. tubiformis*. Accessory species recorded are the dinocyst *Luxadinium* sp., the acritarch *Micrhystridium* sp. A Marshall 1989, and the colonial algae *Amosopollis cruciformis*. The latter was not recorded by Marshall (1989) but subsequently has been documented as a common and consistent species in the Kipper Shale (eg. Partridge, 1989). All microplankton recorded are interpreted as non-marine and predominantly fresh-water forms that are diagnostic of lacustrine environments.

Upper *Coptospora paradoxa* spore-pollen Zone

Interval: 519 to 606 metres.

Age: Late Albian.

The Early Cretaceous Strzelecki Group in Protea-1 is identified in the assemblages recovered from the cuttings at 519m and 606m by an increased abundance of spores (>60% of count) and corresponding decline in abundance of gymnosperm pollen. The spores are dominated by species of *Cyathidites* (average 33%) and the *Baculatisporites/Osmundacidites* group (average 8%), but also conspicuously presence is *Ruffordiaspora* (al. *Cicatricosisporites*) *australiensis* with an average of 4%. The associated gymnosperm pollen show an increase in the abundance of *Podocarpidites* pollen (average 20%) and marked decline in *Dihwynites* pollen (average <10%). As all of the latter pollen are interpreted as caved this residual abundance is symptomatic of significant downhole contamination. Assignment of the two samples to the Upper *C. paradoxa* Zone is based solely on the presence of a single specimen of *Pilosisporites grandis* in the deepest cuttings. Other accessory species consistent with this zone assignment, and not recorded in the overlying Emperor Subgroup section, are *Aequitriradites spinulosus*, *Contignisporites cooksoniae*, *Dictyotosporites complex* and *D. speciosus*.

References

- BERNECKER, T., & PARTRIDGE, A.D., 2001. Emperor and Golden Beach Subgroups: The onset of Late Cretaceous sedimentation in the Gippsland Basin, SE Australia. In *Eastern Australian Basins Symposium. A Refocused Energy Perspective for the Future*, K.C. Hill & T. Bernecker, editors, *Petroleum Exploration of Australia, Special Publication*, p.391-402.
- DETTMANN, M.E., 1963. Upper Mesozoic microfloras from southeastern Australia. *Proceedings Royal Society Victoria* 77, p.1-148.
- DETTMANN, M.E., 1986. Early Cretaceous palynofora of subsurface strata correlative with the Koonwarra Fossil Bed, Victoria. *Association of Australasian Palaeontologists Memoir* 3, p.79-110.
- FENSOME, R.A., WILLIAMS, G.L., BARSS, M.S., FREEMAN, J.M. & HILL, J.M., 1990. Acritarchs and fossil Prasinophytes: An index to genera, species and infraspecific taxa. *AASP Contribution Series No. 25*, p.1-771.
- HELBY, R., MORGAN, R. & PARTRIDGE, A.D., 1987. A palynological zonation of the Australian Mesozoic. In *Studies in Australian Mesozoic Palynology*, P.A. Jell, editor, *Memoir Association Australasian Palaeontologists* 4, p.1-94.
- LOWRY, D.C. & LONGLEY, I.M., 1991. A new model for Mid-Cretaceous structural history of the northern Gippsland Basin. *The APEA Journal*, vol.31, pt.1, p.143-153.
- MARSHALL, N.G., 1989. An unusual assemblage of algal cysts from the late Cretaceous, Gippsland Basin, Southeastern Australia. *Palynology* 13, p.21-56.
- PARTRIDGE, A.D., 1990. Palynological analysis of Admiral-1, Gippsland Basin. *Esso Aust. Ltd. Palaeontological Report 1990/14*, p.1-31 (unpubl.).
- PARTRIDGE, A.D., 1993. Review of palynology from Golden Beach and Strzelecki Groups in Emperor-1 and Sweetlips-1, Gippsland Basin. *Biostrata Report 1993/22*, p.1-17, 2 range charts (unpubl.).
- PARTRIDGE, A.D., 1995. Palynological analysis of Longtom-1 and Sidetrack Gippsland Basin. *Biostrata Report 1995 13*, p.1-28, 3 charts (unpubl.).
- PARTRIDGE, A.D., 1999. Late Cretaceous to Tertiary geological evolution of the Gippsland Basin, Victoria. PhD thesis, La Trobe University, Bundoora, Victoria. p.i-xxix, p.1-439, 165 figs, 9 pls (unpubl.).
- PARTRIDGE, A.D., 2001. Revised stratigraphy of the Sherbrook Group, Otway Basin. In *Eastern Australian Basins Symposium. A Refocused Energy Perspective for the Future*. K.C. Hill & T. Bernecker, editors, *Petroleum Exploration of Australia, Special Publication*, p.455-464.
- PARTRIDGE, A.D., 2002. Palynological analysis of Upper Cretaceous in Deadman Hill-1, onshore Gippsland Basin. *Biostrata Report 2002 16*, p.1-11 (unpubl.).
- STOVER, L.E. & PARTRIDGE, A.D., 1973. Tertiary and late Cretaceous spores and pollen from the Gippsland Basin, southeastern Australia. *Proceedings Royal Society of Victoria*, vol.85, pt.2, p.237-286.
- STOVER, L.E. & PARTRIDGE, A.D., 1982. Eocene spore-pollen from the Werillup Formation, Western Australia. *Palynology* 6, p.69-95.
- TRAVERSE, A., 1988. *Paleopalynology*. Unwin Hyman Ltd, Boston, p.1-600.
- WILLIAMS, G.L., LENTIN, J.K. & FENSOME, R.A., 1998. The Lentin and Williams index of fossil dinoflagellates 1998 edition. *American Association of Stratigraphic Palynologists, Contributions Series, no. 34*, p.1-817.

Table 1: Interpretative data for Protea-1, onshore Gippsland Basin.

Sample Type	Depth	Palynology Zones STAGE/AGE	CR*	Comments and Key Species Present
Cuttings	342m	<i>P. mawsonii</i> SP Zone TURONIAN mixed with caved Lower <i>N. asperus</i> SP Zone and <i>L. balmei</i> SP Zone Middle EOCENE and PALEOCENE	D4 D1 D3	>80% of assemblage comprised of caved Eocene spore-pollen with LADs of darker coloured <i>Dilwynites</i> spp. and <i>Cupressacites</i> sp. defining top of oldest zone. Presence of rare specimens of <i>Lygistepollenites balmei</i> diagnostic of the Paleocene. MP <1% all caved.
Core	350.3m	<i>H. trinalis</i> Subzone of <i>P. mawsonii</i> SP Zone and <i>Rimosicysta</i> MP Superzone TURONIAN	A1 A1 A3	MP 7% including <i>Rimosicysta kipperii</i> , and <i>Wuroia corrugata</i> . LAD of <i>Hoegisporis trinalis</i> ms in SP assemblage dominated by <i>Cupressacites</i> sp. 45% and <i>Dilwynites</i> 25%.
Cuttings	402m	<i>H. trinalis</i> Subzone of <i>P. mawsonii</i> SP Zone and <i>Rimosicysta</i> MP Superzone TURONIAN	D1 D1 D3	MP 4% dominated by <i>Amosopollis cruciformis</i> . SP assemblage dominated by <i>Dilwynites</i> 34%, and containing spore <i>Appendicisporites distocarينات</i> .
Cuttings	471m	<i>H. trinalis</i> Subzone of <i>P. mawsonii</i> SP Zone and <i>Rimosicysta</i> MP Superzone TURONIAN	D1 D1 D3	MP 8.5% with common <i>Rimosicysta</i> and <i>Amosopollis cruciformis</i> . SP assemblage dominated by <i>Dilwynites</i> 37%, associated with multiple specimens of <i>Hoegisporis trinalis</i> ms.
Cuttings	519m	<i>C. striatus</i> to <i>C. paradoxa</i> spore-pollen Zones ALBIAN	D4	MP <2% and mostly caved. Common <i>Cyathidites</i> spores 32% and frequent <i>Ruffordiaspora australiensis</i> 4% distinguish top of Early Cretaceous.
Cuttings	606m	Upper <i>C. paradoxa</i> SP Zone Late ALBIAN	D2	MP 6% and mostly caved. LAD of spore <i>Pilosisporites grandis</i> associated with frequent <i>Ruffordiaspora australiensis</i> 4% diagnostic of zone.

FAD & LAD = Last & First Appearance Datums.

MP = Microplankton

SP = Spore-pollen

*Confidence Ratings used in STRATDAT database and applied to Table 1.

Alpha codes: Linked to sample		Numeric codes: Linked to fossil assemblage		
A	Core	1	Excellent confidence:	High diversity assemblage recorded with key zone species.
B	Sidewall core	2	Good confidence:	Moderately diverse assemblage with key zone species.
C	Coal cuttings	3	Fair confidence:	Low diversity assemblage recorded with key zone species.
D	Ditch cuttings	4	Poor confidence:	Moderate to high diversity assemblage without key zone species.
E	Junk basket	5	Very low confidence:	Low diversity assemblage without key zone species.

BASIC DATA

Table 2: Basic assemblage data for Protea -1, onshore Gippsland Basin.

Sample Type	Depth	Visual Yield	Palynomorph Concentration	Preservation	No. SP Species	No. MP Species
Cuttings	342m	Moderate	Moderate	Poor-Good	13+ (34+)	(1+)
Core-1	350.3m	High	High	Poor-Good	28+	8+
Cuttings	402m	High	Moderate	Poor-Fair	35+ (4+)	5+
Cuttings	471m	High	Moderate	Fair	34+ (21+)	5+ (1+)
Cuttings	519m	Low-Moderate	Low	Poor-Fair	25+ (5+)	2+
Cuttings	606m	Moderate	High	Poor-Good	44+ (5+)	5+ (1+)

Averages: 41+ 4+

* Number of caved Tertiary species given in brackets.

Table 3: Caved Tertiary species abundances and occurrences in Protea-1.

Sample Type:	Cutts	Cutts	Cutts	Cutts	Cutts
Depth:	342m	402m	471m	519m	606m
Spore-Pollen Species					
<i>Anacolosidites acutullus</i>		X			
<i>Baculatisporites</i> spp.	2.0%				
<i>Beaupreaidites trigonalis</i> †	X				
<i>Cyathidites paleospora</i>	2.0%		X		X
<i>Cyathidites splendens</i>	X				
<i>Dacrycarpites australiensis</i>	0.7%				
<i>Dicotetradites clavatus</i>	X		X	X	
<i>Dilwynites granulatus</i>	1.4%		X		
<i>Ericipites crassieximus</i>			X		
<i>Gleicheniidites circinidites</i>	3.4%		X		
<i>Haloragacidites harrisii</i>	13.5%	X	X	X	X
<i>Ilexpollenites</i> sp.	2.0%				
<i>Latrobosporites ovatus</i>			X		
<i>Lygistepollenites balmei</i>	X				X
<i>Lygistepollenites florinii</i>	3.4%	X			
<i>Malvacipollis subtilis</i>	1.4%		X		
<i>Microcachryidites antarcticus</i>	0.7%				X
<i>Nothofagidites brachyspinulosus</i>	0.7%				
<i>Nothofagidites deminutus</i>	5.4%		X	X	

Table 3: Caved Tertiary species abundances and occurrences in Protea-1 (continued).

Sample Type:	Cutts	Cutts	Cutts	Cutts	Cutts
Depth:	342m	402m	471m	519m	606m
<i>Nothofagidites emarcidus/heterus</i>	16.9%	X	X	X	X
<i>Nothofagidites falcatus</i>	X		X		
<i>Nothofagidites flemingii</i>	1.4%		X		
<i>Nothofagidites vansteenisii</i>	X		X		
<i>Phyllocladidites mawsonii</i>	21.6%		X		
<i>Podocarpidites</i> spp.	4.1%		X		
<i>Proteacidites adenanthoides</i>	X		X		
<i>Proteacidites</i> spp.	10.1%		X		
<i>Proteacidites annularis</i>	X		X		
<i>Proteacidites latrobensis</i>			X		
<i>Proteacidites obscurus</i>	3.4%				
<i>Proteacidites pachypolus</i>	X				
<i>Proteacidites reflexus</i>	X				
<i>Retitriletes</i> spp.	0.7%				
<i>Santalumidites cainozoicus</i>			X		
<i>Trichotomosulcites subgranulatus</i>	X				
<i>Tricolp(or)ates</i> spp.	3.4%			X	
<i>Tricolporites adelaidensis</i>			X		
<i>Tricolporites leuros</i>	X				
<i>Triporopollenites ambiguus</i>	0.7%				
<i>Verrucosisporites kopukuënsis</i>	X				
Total Spores:	8%		17%	9%	50%
Total Gymnosperms:	32%	17%	35%	9%	33%
Total Angiosperms:	60%	83%	48%	82%	17%
Total Spore-Pollen:	148	6	23	11	6
Microplankton					
Microplankton undiff.	X				
<i>Gippslandica extensa</i>					X
<i>Spiniferites</i> spp.			X		
Total Microplankton:	1		1		
Combined SP + MP count:	149	6	24	11	6
MP% of MP + SP:	0.7%		4.2%		
Other Palynomorphs Count					
Fungal spores & hyphae	5.1%		X		
Total Others:	8				
TOTAL COUNT:	157	6	24	11	6

Abbreviations:

X= Present:

RW = Reworked:

† = Manuscript species

Table 4: Cretaceous species abundances and occurrences in Protea-1.

Sample Type:	Cutts	Core 1	Cutts	Cutts	Cutts	Cutts
Depth:	342m	350.3m	402m	471m	519m	606m
Spore-Pollen Species						
<i>Aequitriradites spinulosus</i>					1.8%	X
<i>Aequitriradites verrucosus</i>						X
<i>Annulispora microannulata</i>				RW		
<i>Appendicisporites distocarinatus</i>			X			
<i>Aratrisporites</i> spp.			RW			RW
<i>Araucariacites australis</i>	2.5%	2.3%	6.4%	9.3%	0.9%	2.6%
<i>Baculatisporites</i> spp.	X		3.6%	1.1%	3.5%	3.4%
<i>Callialasporites segmentatus</i>		X	X			X
<i>Ceratosporites equalis</i>			X	X	0.9%	X
<i>Cicatricosisporites hughesii</i>						X
<i>Cicatricosisporites</i> spp.			X			X
<i>Contignisporites cooksoniae</i>					X	X
<i>Coptospora pileolus</i> †		X	X			
<i>Corollina</i> spp.		0.9%	1.8%	1.6%		0.9%
<i>Crybelosporites striatus</i>		X	X		X	0.9%
<i>Cupressacites</i> sp.	15.0%	45.2%	11.8%	4.9%	0.9%	X
<i>Cyathidites asper</i>						X
<i>Cyathidites australis</i>	5.0%	0.5%	1.8%	0.5%	5.3%	7.7%
<i>Cyathidites minor</i>		4.1%	9.1%	6.6%	26.5%	27.4%
<i>Dictyophyllidites</i> spp.		0.5%	X	0.5%		1.7%
<i>Dictyotosporites complex</i>						X
<i>Dictyotosporites speciosus</i>						X
<i>Dilwynites echinatus</i> †		X	X	X		
<i>Dilwynites granulatus</i>	52.5%	15.8%	21.8%	22.0%	2.7%	6.8%
<i>Dilwynites pusillus</i> †	X	9.5%	11.8%	15.4%	3.5%	5.1%
<i>Dilwynites tuberculatus</i>			X	X		X
<i>Foraminisporis asymmetricus</i>						X
<i>Foraminisporis dailyi</i>						X
<i>Foraminisporis wonthaggiensis</i>						X
<i>Gleicheniidites circinidites</i>		0.9%	1.8%	0.5%	1.8%	2.6%
<i>Herkosporites elliottii</i>	X		1.8%	1.6%		
<i>Herkosporites proxistriatus</i>				X		X
<i>Hoegisporis trinalis</i> †		0.5%	X	0.5%	X	X
<i>Klukisporites scaberis</i>		X				
<i>Laevigatosporites musa</i> †		X	X	X		X
<i>Laevigatosporites ovatus</i>		0.5%	2.7%	1.6%		1.7%
<i>Leptolepidites verrucosus</i>			RW		X	X
<i>Matonisporites cooksoniae</i>					X	X
<i>Marattisporites scabratus</i>		0.5%		X		
<i>Microcachryidites antarcticus</i>	7.5%	5.4%	4.5%	8.8%	4.4%	4.3%
<i>Neoraistrickia truncata</i>	X	0.5%				
<i>Osmundacidites wellmanii</i>		1.8%	X	0.5%	8.0%	0.9%

Table 4: Cretaceous species abundances and occurrences in Protea-1 (continued).

Sample Type:	Cutts	Core 1	Cutts	Cutts	Cutts	Cutts
Depth:	342m	350.3m	402m	471m	519m	606m
<i>Perotrilites jubatus</i>			X	0.5%		
<i>Perotrilites majus</i>				X		0.9%
<i>Pilosporites grandis</i>						X
<i>Podocarpidites</i> spp.	15.0%	8.1%	11.8%	19.2%	21.2%	17.9%
<i>Retitriletes austroclavatidites</i>						X
<i>Retitriletes nodosus</i>	X					X
<i>Retitriletes</i> spp.		0.9%	2.7%	X	0.9%	1.7%
<i>Ruffordiaspora australiensis</i>				X	4.4%	4.3%
<i>Stereisporites antiquisporites</i>	2.5%	X		0.5%	3.5%	0.9%
<i>Stoverisporites microverrucatus</i>			X	X		
<i>Trichotomosulcites subgranulatus</i>		0.5%	X	1.6%	3.5%	5.1%
<i>Tricolp(or)ates</i> spp.			1.8%	0.5%	0.9%	
<i>Tricolporites variverrucatus</i> †			X			
Trilete spores undiff.		1.4%	2.7%	0.5%	4.4%	2.6%
<i>Triporoletes reticulatus</i>	X		X		0.9%	0.9%
<i>Tuberculatisporites</i> sp. A			0.9%			
<i>Verrucosporites admirabilis</i> †		X	0.9%	X		
<i>Vitreisporites signatus</i>		0.5%		1.1%		
Total Spores:	8%	11%	28%	15%	62%	57%
Total Gymnosperms:	93%	89%	70%	85%	37%	43%
Total Angiosperms:			1.8%	0.5%	0.9%	
Total Spore-Pollen count:	40	221	110	182	113	117
Microplankton						
Microplankton undiff.		18%				25%
<i>Amosopollis cruciformis</i>		29%	60%	29%	50%	
<i>Botryococcus braunii</i>		12%				25%
<i>Luxadinium</i> sp.		X	20%	24%		38%
<i>Micrhystridium</i> sp. A		12%	20%	6%		13%
<i>Rimosicysta</i> spp.		29%	X	29%		
<i>Rimosicysta kipperii</i>		X	X			
<i>Schizosporis reticulatus</i>						X
<i>Sigmopollis carbonis</i>					50%	
<i>Wuroia corrugata</i>		X				
<i>Wuroia tubiformis</i>				12%		
Total Microplankton:		17	5	17	2	8
Combined MP + SP Count:	40	238	115	199	115	125
MP% in SP + MP counts		7.1%	4.3%	8.5%	1.7%	6.4%
Total Cretaceous Count:	40	247	116	208	115	126
Total Tertiary Count:	157		6	24	11	6
% Caved Palynomorphs:	80%		5%	10%	9%	5%

Abbreviations: X = Present; RW = Reworked; † = Manuscript species

Appendix 3

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APPENDIX 3

CORE DESCRIPTIONS

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CORE NO. 1

349.5 – 356.0 Metres

Core # 1 349.5 to 356.0 meters (cut 6.5m, Rec 349.5 – 350.3m (0.8m) 12%).

Well began flowing fresh water and sand whilst coring.

349.5 – 350.3m

CLAYSTONE: very dark grey to black, very carbonaceous, moderately silty, non calcareous, trace micromica, firm, non fissile.

350.3 – 356.0m

No recovery (lost section assumed to be from bottom of core – not necessarily correct).

No visible sedimentary structure, tectonic structure or bedding.

Drill rates: 349.5 – 350 = 8min/m. 350.5 – 351.5 = 12min/m. 351.5 – 352.5 = 12min/m.
352.5-353.5 = 13.5 min/m. 353.5-354.5 = 16 min/m. 354.5-355.5 = 12.5 min/m. 355.5-356.0
= 11 min/m.

Gas whilst coring; 3-5 units, peak at 354-355m = 9 units.

913672 072

Appendix 4

913672 073

APPENDIX 4
WELL SITE SURVEY

Kluge Jackson Pty Ltd

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SURVEYORS, ENGINEERS AND ESTATE PLANNERS

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DIRECTORS:
H. Peter Kluge
John Jackson

September 10th, 2002

Mr. J. Mulready,
Lakes Oil N.L.
Level 11, 500 Collins St,
Melbourne, Vic., 3000

Dear Sir,

RE: AMG and AHD Survey of Wells at Boundary Creek-1,
Deadman Hill-1 and Protea-1.

We have now completed the above survey and enclose our results.

The table of results shows the co-ordinates to the centre of the sign of the well head.

The levels are as indicated on sketch attached – Levels to the top of cap could not be taken at Boundary Creek and Protea as they were covered at time of survey.

Our AMG co-ordinates have been obtained from co-ordinated marks PM 18, PM 27 (Longford) and 3GI Radio Mast. The AMG co-ordinates are unadjusted using Topcon Total Station and should be of an accuracy of ± 10 cm. Latitude and Longitude have been obtained by converting AMG co-ordinates to latitude and longitude.

The AHD levels were obtained from PM 33 and are correct to ± 0.05 cm.

If you have any queries in the matter please contact the writer.

We thank you for your instructions and enclose our account.

Yours faithfully,
KLUGE JACKSON CONSULTANTS PTY., LTD.,



PETER KLUGE.
enc.

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SALE, Vic 3850
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Facsimile (03) 5144 6591

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Office: Sale
Our Ref: 02191-02

- 2 -

DIRECTORS:
H. Peter Kluge
John Jackson

September 10th, 2002

TABLE OF SURVEY RESULTS

Boundary Creek - 1

AHD Level of Top of Sign	77.02
AMG Co-ordinate of Centre of sign.	Easting 511 422.91 Northing 5 772 873.47
Latitude	S 38°11'30.73"
Longitude	E 147°07'49.60"
Approximate AHD surface Level at Bore	75.02

The AMG coordinates shown above are for Zone 55.

Coordinates are in AGD 66.

.../3

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SURVEYORS, ENGINEERS AND ESTATE PLANNERS

Office: **Sale**
Our Ref: **02191-02**

- 3 -

DIRECTORS:
H. Peter Kluge
John JacksonSeptember 10th, 2002**TABLE OF SURVEY RESULTS****Deadman Hill - 1**

AHD Level of Top of Cap	57.45
AHD Level of Top of Sign	59.96
AMG Co-ordinate of Centre of sign.	Easting 515 827.27 Northing 5 772 244.60
Latitude	S 38°11'50.90"
Longitude	E 147°10'50.72"
Approximate AHD surface Level at Bore	58.57

The AMG coordinates shown above are for Zone 55.

Coordinates are in AGD 66.

.../4

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SURVEYORS, ENGINEERS AND ESTATE PLANNERS

Office: **Sale**
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H. Peter Kluge
John JacksonSeptember 10th, 2002**TABLE OF SURVEY RESULTS****Protea - 1**

AHD Level of Top of Sign	63.32
AMG Co-ordinate of Centre of sign.	Easting 512 876.67 Northing 5 772 884.02
Latitude	S 38°11'30.32"
Longitude	E 147°08'49.36"
Approximate AHD surface Level at Bore	61.98

The AMG coordinates shown above are for Zone 55.

Coordinates are in AGD 66.

.../2

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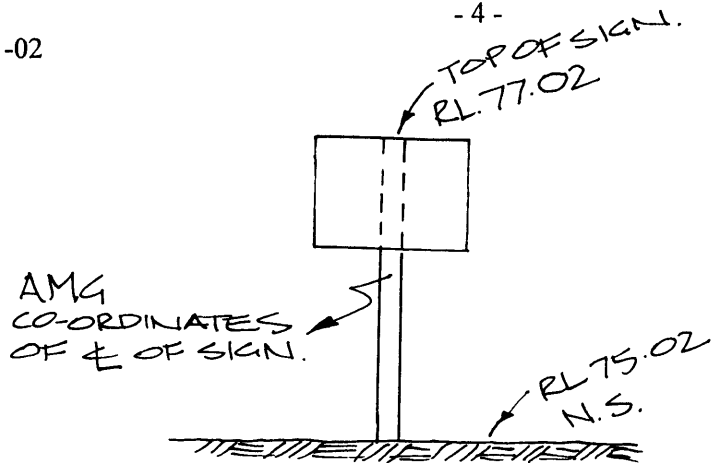
A.C.N. 004 778 947

SURVEYORS, ENGINEERS AND ESTATE PLANNERS

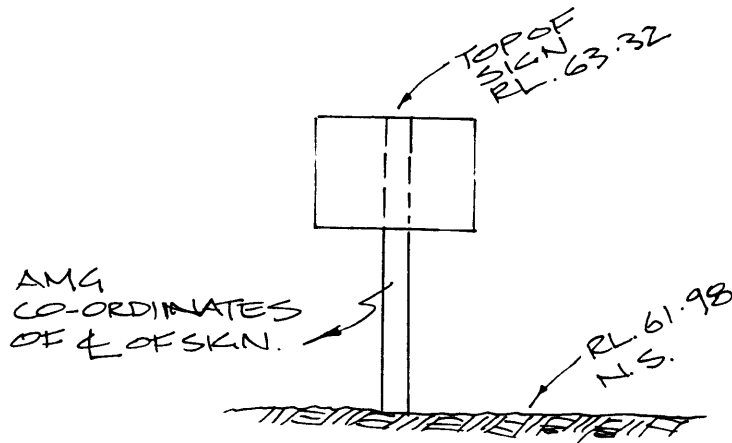
Office: **Sale**
Our Ref: **02191-02**

DIRECTORS:
H. Peter Kluge
John Jackson

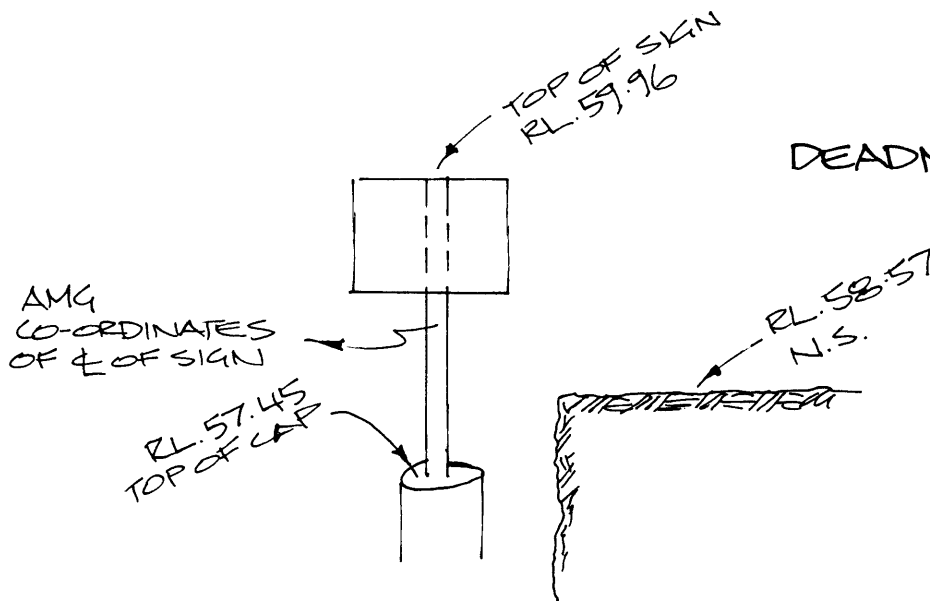
- 4 -



BOUNDARY CREEK 1-A



PROTEA-1



DEADMAN'S HILL

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913672 079

PE651020

This is an enclosure indicator page.
The enclosure PE651020 is enclosed within the
container PE913672 at this location in this
document.

The enclosure PE651020 has the following characteristics:

- ITEM_BARCODE = PE651020
- CONTAINER_BARCODE = PE913672
 - NAME = Protea-1 Lithology Strip Log, 1:500
 - BASIN =
 - OFFSHORE? =
 - DATA_TYPE = WELL
 - DATA_SUB_TYPE = WELL_LOG
 - DESCRIPTION = Protea-1 Lithology Strip Log, Scale
1:500, Well Site Systems, PEP 157, June
2002.
 - REMARKS =
 - DATE_WRITTEN = 03-JUN-2002
- DATE_PROCESSED =
- DATE_RECEIVED =
- RECEIVED_FROM = Lakes Oil N.L.
 - WELL_NAME = Protea-1
 - CONTRACTOR =
 - AUTHOR =
 - ORIGINATOR = Lakes Oil N.L.
 - TOP_DEPTH = 0
 - BOTTOM_DEPTH = 825
- ROW_CREATED_BY = FH11_SW

(Inserted by DNRE - Vic Govt Mines Dept)

913672 080

PE651022

This is an enclosure indicator page.
The enclosure PE651022 is enclosed within the
container PE913672 at this location in this
document.

The enclosure PE651022 has the following characteristics:

ITEM_BARCODE = PE651022
CONTAINER_BARCODE = PE913672
NAME = Protea-1 FMI-BHC-GR Log, FMI MS Dip
BASIN =
OFFSHORE? =
DATA_TYPE = WELL
DATA_SUB_TYPE = WELL_LOG
DESCRIPTION = Protea-1 FMI-BHC-GR Log, FMI MS
Dip1:500 & 1:200, Run 1, By
Schlumberger for Lakes Oil N.L., June
2002.
REMARKS =
DATE_WRITTEN = 18-JUN-2002
DATE_PROCESSED =
DATE_RECEIVED =
RECEIVED_FROM = Lakes Oil N.L.
WELL_NAME = Protea-1
CONTRACTOR = Schlumberger
AUTHOR =
ORIGINATOR = Lakes Oil N.L.
TOP_DEPTH = 25
BOTTOM_DEPTH = 760
ROW_CREATED_BY = FH11_SW

(Inserted by DNRE - Vic Govt Mines Dept)

913672 081

PE651021

This is an enclosure indicator page.
The enclosure PE651021 is enclosed within the
container PE913672 at this location in this
document.

The enclosure PE651021 has the following characteristics:

ITEM_BARCODE = PE651021
CONTAINER_BARCODE = PE913672
NAME = Protea-1 FMI-BHC-GR Log, Sonic DT
BASIN =
OFFSHORE? =
DATA_TYPE = WELL
DATA_SUB_TYPE = WELL_LOG
DESCRIPTION = Protea-1 FMI-BHC-GR Log, Sonic DT,
1:500 & 1:200, Run 1, By Schlumberger
for Lakes Oil N.L., June 2002.
REMARKS =
DATE_WRITTEN = 18-JUN-2002
DATE_PROCESSED =
DATE_RECEIVED =
RECEIVED_FROM = Lakes Oil N.L.
WELL_NAME = Protea-1
CONTRACTOR = Schlumberger
AUTHOR =
ORIGINATOR = Lakes Oil N.L.
TOP_DEPTH = 25
BOTTOM_DEPTH = 760
ROW_CREATED_BY = FH11_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE651023

This is an enclosure indicator page.
The enclosure PE651023 is enclosed within the
container PE913672 at this location in this
document.

The enclosure PE651023 has the following characteristics:

ITEM_BARCODE = PE651023
CONTAINER_BARCODE = PE913672
NAME = Protea-1 Composite Well Log
BASIN =
OFFSHORE? =
DATA_TYPE = WELL
DATA_SUB_TYPE = COMPOSITE_LOG
DESCRIPTION = Protea-1 Composite Well Log (scale
unknown), for Lakes Oil N.L., June
2002.
REMARKS =
DATE_WRITTEN = 03-JUN-2002
DATE_PROCESSED =
DATE_RECEIVED =
RECEIVED_FROM = Lakes Oil N.L.
WELL_NAME = Protea-1
CONTRACTOR =
AUTHOR =
ORIGINATOR = Lakes Oil N.L.
TOP_DEPTH = 25
BOTTOM_DEPTH = 760
ROW_CREATED_BY = FH11_SW

(Inserted by DNRE - Vic Govt Mines Dept)