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# Essential Petroleum Resources Limited

MINERALS AND PETROLEUM  
REGULATION

25 JAN 2006

RECEIVED

PRITCHARD-1

WELL PROPOSAL

PEP 151  
OTWAY BASIN, VICTORIA

January 2006

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## 2 General Well Information

WELL NAME: Pritchard-1

PERMIT: PEP 151

BASIN: Onshore Otway Basin

TYPE OF WELL: Oil and gas exploration

PARTICIPATION INTERESTS: Essential Petroleum Resources Limited (operator) 50%  
Bass Strait Oil & Gas 25%  
IOR Exploration Pty Ltd 25%

LOCATION: Seismic line WGD352 at shot point 116  
Easting 518,420 m, Northing 5,753,355 m,  
MGA Zone 54

ELEVATION: Ground Level: 38 m AMSL (approximate)  
Rotary Table: 42.3 m AMSL (approximate)

PROPOSED T.D: 2100 m with option to extend to 2650 m

PRIMARY OBJECTIVES:

SECONDARY OBJECTIVES Flaxman

COMBINED UNRISKED P50  
RECOVERABLE RESERVES:

WELL COST ESTIMATE: P&A: \$3,000,000

### 3 Permit Information

#### 3.1 Permit Summary

PEP 151 was awarded in May 2002 and is currently in year 3 of a 5 year term.

PEP 151 is located in the western Victorian part of the onshore Otway Basin (figure 2). The Tartwaup Fault transects the Permit dividing the area into the Voluta and Portland troughs in the south and the Mumbannar Platform to the north. A southern fringe of the Penola Trough extends into the far north of PEP151.

A thick section of Early Cretaceous Eumeralla Formation occurs at relatively shallow depths in the Mumbannar Platform. At the Tartwaup Fault the Eumeralla Formation is faulted down and is assumed to underlie all of PEP 151 and to extend offshore. South of the Tartwaup Fault, the Late Cretaceous and Tertiary section thicken dramatically. Voluta Trough contains a thick sequence of Late Cretaceous Sherbrook Group sediments and extends offshore across the continental shelf. The overlying Portland Trough is an Early Tertiary NW to SE oriented depocentre extending from PEP 151 southeast into PEP 150 and southwest into the immediately adjacent offshore areas.

Prospective sequences identified within PEP 151 can be grouped as follows:

.	.
.	Flaxman
Mudstone	.
.	.
.	.

The SEAGas gas pipeline lies approximately 20 km to the north of the well site and would provide a market if significant gas volumes were discovered. Road access for oil transport to Geelong or Adelaide via the princes Highway would be relatively straightforward.

#### 3.2 Exploration History

Seismic data has been acquired in the area since 1958. The most recent being the Nelson Seismic Survey carried out in 2003 by Essential Petroleum Resources. The most extensive exploration effort has been by Beach Petroleum NL during the 1980s including the Wanwin Gorae seismic surveys and the drilling of six wells. The presence in the Permit of the Lower Glenelg National Park has historically restricted exploration however in 2003 EPR was granted access to conduct seismic exploration within the Park and to directionally drill to targets within the Park from locations outside.

Seven modern petroleum exploration wells have been drilled in the permit since 1985. Table 1 summarizes the results of these wells. Efforts to test valid targets have been hampered by hole problems and the difficulties in mapping faults and horizons in the seismic data of the time.

A number of deep stratigraphic and water development bores in the area have contributed stratigraphic understanding particularly in the Tertiary Portland Trough interval

The exploration of the body of the Portland Trough south of the Tartwarp Fault is very poor. The only well of significance, Fahley 1 could not be logged due to hole problems. The majority of the wells are distributed along the northern margin of the trough where non-representative sections of the lower Sherbrook Group were intersected. Drill stem testing has generally been unsuccessful due to mechanical and packer seat failures.

Earlier drilling by government and by speculative oil consortia since 1925 identified the presence of a thick Late Cretaceous sequence and identified clean sands in the top Paaratte Formation. There is no surviving record of the how these wells were targeted or their specific geological objectives. The lack of wireline logging limits the contribution this early work makes. The 1945 Glenelg-1 well demonstrates the presence of occasional sands in the Sherbrook group in the Nullawarre Greensand equivalent and possibly the Belfast Formation but does not appear to have penetrated to the Flaxman Formation. A reported gas and oil show possibly in the Paaratte Formation in Glenelg-1 well remains an intriguing anomaly.

**Table I : Wells Drilled In PEP 151**

Name	TD	Date	Target	Result
<b>Palpara 1</b> Point Addis Co NL	1170 ft	1925	NR	P & A unlogged. No shows recorded
<b>Mumbannar 1</b> Mersey Valley Oil Co	1100 ft	1926	NR	P & A unlogged. No shows recorded
<b>Nelson 1</b> Western Petroleum/ Producing Oilfields Ltd	468 m	1939	NR	P & A unlogged. No shows recorded
<b>Glenelg 1</b> Government	2225 m	1945	NR	P & A Logged to 450 m. Physical oil and gas show reported in Paaratte Fm at 4045' (1232m).
<b>Fahley 1</b> Beach		1985	Pebble Point Waarre	P & A with flu. in Pember & Flaxman, gas shows in Pebble Point and Waarre. Misrun tests in the Pebble point, abandoned unlogged due to hole problems. Outside closure at Waarre level.
<b>Najaba 1 &amp; 1a</b> Beach		1986	Pember Pebble Point Paaratte Waarre	P & A with flu. in Flaxman and Eumeralla sands. TD in Eumeralla Fm. Waarre Fm faulted out. Probable cross-fault seal failure
<b>Henke 1</b> Beach		1987	Pebble Point Paaratte	P & A with minor flu. in Pebble Point. No tests. well is outside mapped closure.
<b>Fahley 2</b> Beach		1987	Pebble Point	No shows, well outside of mapped closure.
<b>Wilson 1</b> Beach		1987	Pebble Point Paaratte	P & A with 60% fluorescence in Pebble Point. Three tests all with packer seat failures.
<b>Squatter 1</b> Beach		1987	Waarre	P & A no shows. Located outside Portland & Volta Troughs, Waarre Fm is absent.
<b>Pine Lodge 1</b> Gas & Fuel Corp		1990	Waarre	P & A with CO <sub>2</sub> flows from ?Flaxman sands Upper part of Sherbrook Gp sand-prone, lower part incl. Waarre Fm is thin and shaley. Located outside Portland Trough.

## 4 Geological Information

### 4.1 Regional Setting

There are three main episodes of depositional and structural development in the Otway Basin and the regional geology of PEP151 reflects this division. The earliest episode in the Early Cretaceous, comprising the Crayfish Group, occurs in the north of PEP 151 (Figure 2) in the Penola and Tantanoola Troughs. These narrow rift basins are overlain by the more laterally extensive Eumeralla formation, which occurs in the Mumbannar Platform and throughout PEP 151. After uplift and erosion during the Cenomanian, rifting in the Otway Basin was reactivated in the Late Cretaceous. In PEP 151 syn-depositional movement on the Tartwaup Fault and a marine incursion allowed thick deposits of Late Cretaceous deltaic Sherbrook group sediments to accumulate on the southern side of the fault forming the Voluta Trough. Subordinate regressive cycles formed sandstones, for example the Nullawarre Greensand equivalent and in the Shipwreck Trough the Thylacine Sandstone, within an overall initially shale-prone package of sediments. A brief return to shale prone conditions is named the Skull Creek Mudstone in the Port Campbell embayment. Overall the whole Sherbrook Group sequence coarsens upward to deltaic sands of the uppermost Paaratte Formation.

To the north of the Tartwaup Fault late Cretaceous sediments thin rapidly northwards over the Mumbannar Platform.

After a brief period of non-deposition and minor uplift the at the Cretaceous - Tertiary boundary subsidence along the Tartwaup fault continued and increased rapidly through the early Tertiary deposition of the deltaic Wangerrip Group in the Portland Trough.

The final depositional episode comprising a major transgression and the onset of open marine conditions is expressed as a relatively thin veneer of marls and limestone.

The distribution of the Late Cretaceous and Tertiary sequences are also controlled by transverse regional highs. The Discovery Bay High extends southwest across PEP 151 and divides the Otway Basin into the Morum and Nelson Sub-basins. PEP 151 is on the western flank of the Discovery Bay High and hence the processes involved in sediment distribution in the Morum Sub-basin are relevant.

Figure 3 presents a Geoscience Australia summary of the stratigraphy and regional geological development of the Otway Basin. The Late Cretaceous stratigraphy in the western Otway as intersected in wells in South Australia is somewhat different to that developed for the Port Campbell Embayment in Victoria.

### 4.2 Pritchard Prospect

#### 4.2.1 Seismic coverage

Pritchard is covered by an irregular grid of 2D seismic data of mixed vintage ranging from 1984 through 2003. Quality is variable. Seismic data recorded in 1988 by Beach Petroleum was reprocessing and incorporated into existing mapping to define the prospect.

The main uncertainties associated with the mapping of the Pritchard prospect are the location and correlation of the prospect-bounding faults.

## 5 Evaluation

### 5.1 *Mudlogging*

#### 5.1.1 Procedures

Mudloggers will monitor the well from commencement of the 12 ¼" hole section. Draft copies of the mudlog and daily operational reports will be submitted to the EPRL wellsite representative at 0600 each morning for inclusion in the morning report.

Samples will be examined for fluorescence and any shows reported to EPRL

Drilling breaks and any other departure from normal drilling will be reported immediately to EPRL and to the driller. Unless otherwise instructed drilling breaks of 2 m duration as defined by an increase in drill rate of more than double the previous rate of penetration will be evaluated by stopping drilling, checking the well for flow, and circulating a sample to surface.

#### 5.1.2 Equipment

The following equipment will be kept operational at the wellsite:

Total gas detector

Gas chromatograph detector

C02 detector

Depth/ROP monitor

Pit volumes indicator

Pump stroke monitor.

Where appropriate calibrations will be included in operational reports.

#### 5.1.3 Sampling

Samples will be collected at 10 m intervals from commencement of logging to a depth of 1000 m and thereafter at 3 m intervals to TD. Spot samples will be taken to evaluate drilling breaks. Samples will be distributed as per the following table.

**Table 6: Sample Distribution**

	<b>Essential Petroleum Resources Limited</b>	<b>Department of Sustainability and Environment</b>
Samplex Tray	1	
Washed and air dried 100g minimum	2	1
unwashed	1	

## 5.2 *Drill Stem Testing*

Evaluation by drill stem testing will be undertaken on intersection of significant hydrocarbon shows. The program to be undertaken will be developed at the wellsite and authorized by the EPRL Melbourne office. Hydrocarbon zones will be evaluated by bottom-hole DST as soon as possible after penetration. Drill stem testing by inflate straddle after logging may be carried out if warranted to confirm hydrocarbon zones identified on logs.

## 5.3 *Wireline Logging*

In the event of significant hydrocarbon intersections while drilling the logging program will be:

1. Dual resistivity & Rxo, neutron, density, crossed dipole sonic, spectral gamma from TD to the surface casing shoe. A high-resolution pass will be run across the primary zone of interest as indicated by the wellsite geologist.
2. Pressures by wireline with sufficient sampling options to take multiple samples. (levels to be advised by WSG)
3. NMR to be run over a minimum interval if hydrocarbons in low permeability reservoir are hard to assess by conventional means.
4. Checkshot velocity survey (20 levels, depths to be advised by WSG)
5. Sidewall cores will be acquired if required to assess shows and to improve sample quality for palynology and petrography.

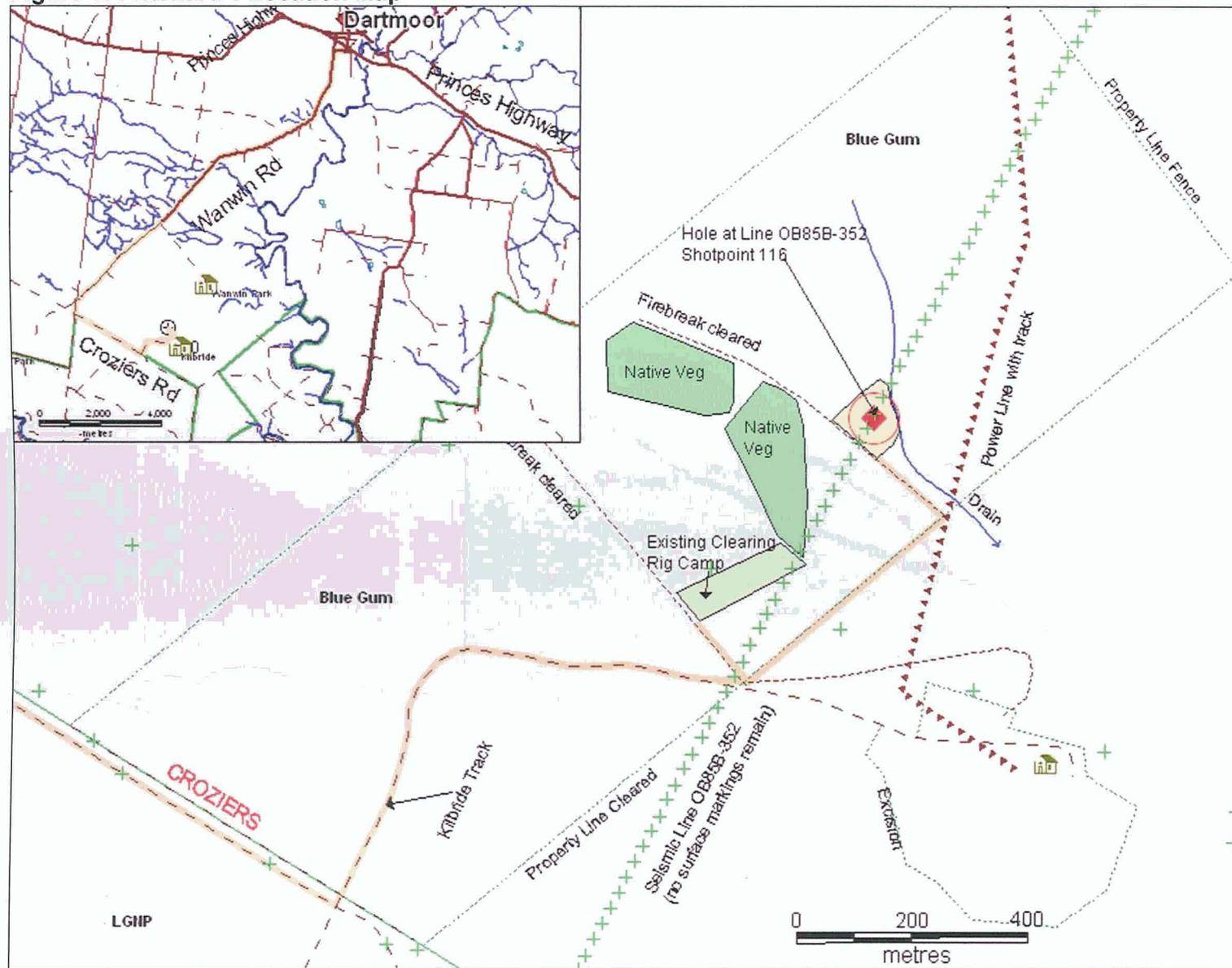
In the event of nil significant hydrocarbon indications while drilling the minimum logging program will be:

1. Dual resistivity and Rxo, density, neutron, sonic, natural gamma
2. Checkshot survey (20 levels)
3. Petrophysical evidence of hydrocarbons to be then assessed with pressure testing/sampling and/or sidewall cores.

The log data will be communicated to the EPRL office for petrophysical evaluation as soon as possible. Petrophysical evidence of hydrocarbons will be assessed by MDT in the first instance.

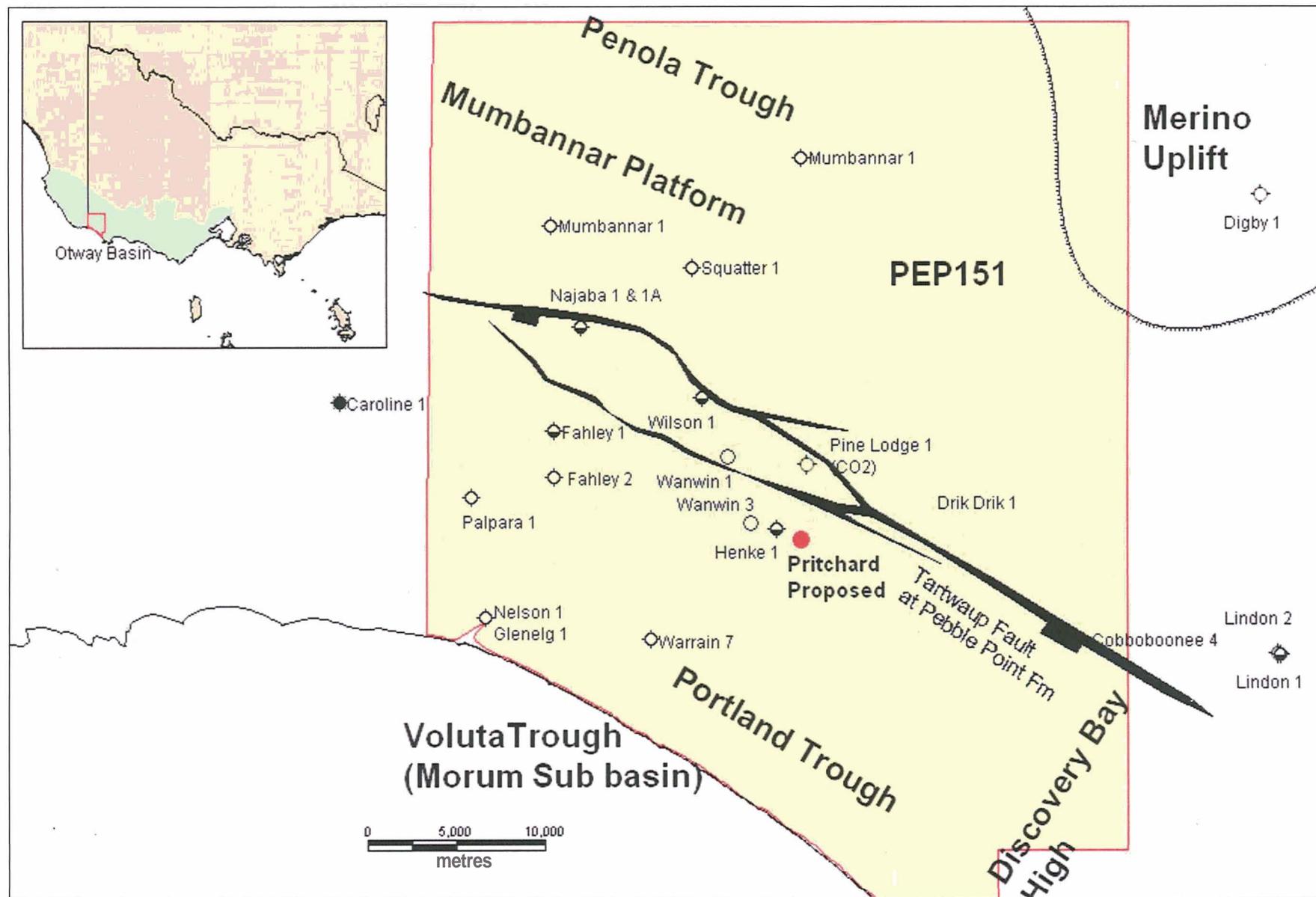
The wireline contractor will present all products for quality control at the wellsite, and will present final paper copies and digital copies of all logs. Logs to be prepared at 1:200 and 1:500 scale.

Figure 1: Pritchard 1 Location Map



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Figure 2: PEP151 Location and Geological Setting



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