PEL 84

Otway Basin,
South Australia

Annual Report
Year One

22nd February, 2001 to 23rd February, 2002

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ANNUAL REPORT FOR EXPLORATION PERMIT PEL 84

PERMIT YEAR ONE
23rd February, 2001 to February 22nd, 2002

1.0 INTRODUCTION

Petroleum Exploration Licence No. 84 ("PEL 84"), is located in the southeastern corner of South Australia, in the onshore portion of the Otway Basin. The permit encompasses a portion of the Jurassic to Early Cretaceous Penola Trough. The Penola Trough is a half graben and the northern border of the permit lies near the northeastern boundary of the trough. The Penola Trough is a proven hydrocarbon-bearing province containing the adjacent producing gas fields of Katnook, Redman, Ladbroke Grove and Haselgrove. PEL 84 covers approximately 581 square kilometres in area and is made up of parts of the former permits PEL 32 and PEL 27, which were relinquished in 1999 and 2000.

The permit was awarded to AWE Petroleum Pty. Ltd. on February 23rd, 2001 for a period of five years. This report covers the work performed by AWE during the permit's first year.

PEL 84 is in good standing with all the guaranteed, required work commitments for Year One completed.

2.0 ADMINISTRATION

The working interest in the permit was: -

AWE Petroleum Pty. Ltd. (Operator)	100%

The work requirements for the block were as follows:

Permit Commitments:

Year	***Requirements***	***Cost***
Year 1:	200km seismic reprocessing plus G & G	$ 95,000
Year 2:	100km 2D seismic program plus G & G	$ 485,000
Year 3:	G & G	$ 40,000
Year 4:	Drill one well plus G & G	$2,530,000
Year 5:	G & G	$ 40,000

3.0 EXPLORATION ACTIVITY

3.1 Seismic Data Acquisition

No new seismic lines or any surveys were acquired during the year.

3.2 Seismic Data Reprocessing

Fourteen 2D seismic lines, totalling 264km, mainly covering the southeastern portion of the permit were selected for reprocessing. The vintages ranged from 1985 to 1993, the majority being north-south lines with few east-west tie lines.

Copies of digital field seismic data and their supporting documents were obtained from the Petroleum Industries and Resources, South Australia (PIRSA). Robertson Research in Perth reprocessed these lines during February to July 2001, with final output including migrated stacks and offset stacks (see Processing Report, September 2001, by Robertson Research). The reprocessing work was carried out under the supervision of processing specialist, Mr. Jim Montalbetti.

Open file processed digital data files in SEGY format were also procured from PIRSA and loaded into Landmark Graphics interpretation system at AWE in Sydney.

The selected grid of lines was reprocessed in order to create a consistent, integrated set of data for workstation interpretation, as there were several different ages of seismic surveys and to produce better fault definition plus to improve data quality of the pre-Eumeralla Formation section. It was anticipated that this would increase the reliability of mapping the top of the Pretty Hill Formation. In addition, gross reservoir quality and perhaps hydrocarbon charge could be estimated from the enhanced lines, based upon seismic amplitudes, attributes and character near the Pretty Hill Formation horizon.

Following tests upon a selected line from the Reynella Survey, a common processing stream was applied to all seismic lines and thus a consistent approach was achieved for the interpretation of statics and stacking velocities.

From the 14 seismic lines reprocessed, the three oldest from the 1985 Kalangadoo Survey, UA85-10, -18 and -49, showed little or no improvement in the pre-Crayfish Group Unconformity interval (possibly because they are relatively low fold). They were consequently little use in the interpretation of the Top Pretty Hill seismic horizon. The one line from the Killanoola Survey OK90-414 was of very poor data quality thus was not utilized further. Reprocessing of the Coonawarra Survey lines, C90-10 and -12ext resulted in some improvement. The eight lines from the 1993 Reynella Survey showed considerable improvement on some lines, though little on others.

To aid in assessing reservoir quality, three angle migrated stack datasets (near, mid and far traces) were processed separately by Robertson Research and then

archived to SEGY format. Amplitude mapping and variation with offset (AVO) analysis was then possible (see Robertson Research reprocessing report for details). The lines from the Coonawarra and Reynella surveys were included for the angle stack work as the data quality for the older lines was inadequate to supply meaningful results.

3.3 Aeromagnetic Survey Reprocessing

A test aeromagnetic survey entitled "Otway Basin aeromagnetic/radiometric test survey" was flown in 1993 by MESA, with limited company participation. AWE reprocessed a section of the survey, which covered much of PEL 84. Encom Technology Pty. Ltd. in North Sydney completed the reprocessing of 11,834km of aeromagnetic data. The project was undertaken to investigate what structural information could be recovered from the existing magnetic data utilizing the latest techniques to increase the magnetic response of the fault trends at various stratigraphic horizons.

Traverse lines were flown at a line spacing of 400m at a 180° to 360° orientation with tie lines at 400m spacing and 90° and 270° orientation. The plane was flown at an elevation of 80m above the ground.

Man made 'cultural' variations such as power lines and buildings were first identified using features identified on topographic maps, then removed, creating a total magnetic image (TMI) map (see Encom's "Enhancement of Aeromagnetic Data over the Otway Basin, S.A., June, 2001). Circular features over known igneous bodies and lineations became evident. The reprocessing was then designed to enhance the weak yet coherent linear features that were interpreted to relate to faulting in the shallow section.

To accentuate the areas of interest deeper in the section, the "first vertical derivative" (FVD) was applied, then an "automatic gain control" (AGC) filter was utilized to amplify the weaker shallow-source, low amplitude variations and remove background fields.

Another method of enhancing sources from a particular depth range was to apply spectral filters. Bandpass filters were selected as the most appropriate frequency domain operator. A high frequency and long wavelength cut-off was applied to remove residual surface noise and broader variations due to deeper sources respectively. Several experimental wavelengths were run, with the most coherent result being a pass range of 50 to 1500m wavelength.

3.4 Geological and Geophysical Studies

The area of PEL 84 considered to be the most prospective was determined to be southeastern portion of the block situated closest to the adjacent producing gas fields of Ladbroke Grove and Haselgrove.

The northern section abutting the northern margin of the Penola Trough along the northwest-trending, southwest-dipping Kanawinka Fault was deemed to be the least prospective. Seismic lines cover this northern part of PEL 84 quite sparsely, with vintages ranging from 1985 to 1995. There is only one 3D survey (conducted by the Oil Company of Australia, the first in the Otway Basin), the majority of the grid located in PEL 27 over the Penola-Sawpit area with the northern portion extending into PEL 84. Only two wells have been drilled within the current permit boundaries, Robertson-1 and Robertson-2, in 1967, by Alliance Petroleum, and these are situated in the far northwestern corner of the block.

The main play identified on the northern flank of the basin is the Sawpit Sandstone sealed by the Sawpit Shale. A brief study was carried out of the feasibility of the Sawpit Sandstone to provide a good reservoir in the north of PEL 84. It is generally of poor to moderate quality, but has low net/gross in the upper part, beneath the regional seal. Distribution of the Sawpit Sandstone is similar to the younger Pretty Hill, isolated in separate fault blocks, but is not traceable easily across faults or on a larger scale throughout the permit. On the northern flank, towards the basin edge, the Sawpit Sandstone can be mapped from the extent of high amplitude seismic reflectors. Faulting in the Sawpit Sandstone mirrors that of the basement and is dominated by faults formed by early rifting. Most structures are fault dependent closures which means timing of fault initiation and reactivation are crucial. In most instances the Sawpit Sandstone is juxtaposed against the Sawpit Shale, though at the basin edge in the east it abuts the basement. It remains to be demonstrated whether the bounding fault would act as a good enough seal.

From the few seismic lines that cross the permit to the north, it appears that the Sawpit Sandstone does not have great areal extent. It has a patchy nature, and is possibly absent through the majority of the northwestern end of the block due to non-deposition or has undergone erosion up on the flanks of the basin. The Sawpit thickens greatly into the Penola Trough beneath the Pretty Hill Formation. In the southern part of PEL 32 and PEL 84, the Sawpit is very deep and the loss of porosity as a result of compaction plus a possibly more shale-prone facies in the deeper parts of the trough renders the play in this area unattractive.

The thin eastern and larger southern sections of the permit appear to hold the greatest potential and thus the majority of the time and effort was focused upon this region.

The enhanced magnetic imagery derived from the reprocessed aeromagnetic survey was matched with interpretation of faults from the reprocessed seismic data to reveal possible correlations. Results were compared to the preliminary interpreted faults on structure maps derived from the reprocessed 2D seismic data

and also with interpretation of faults and structure from maps (utilizing both 2D and 3D seismic surveys) prepared by the adjacent PEL 32 Joint Venture partner. This led to some modification of fault patterns interpreted over PEL 84. Both east-northeast to northwest and east-west trending lineaments were noted, indicating the possibility of favourable fault orientations for closed structures. Fault interpretation at the Top Pretty Hill level was considered to be more reliable as a result of incorporating the reprocessed aeromagnetic data.

All the gas fields in the neighbouring Permit PEL 32 are contained within tilted fault blocks formed by normal faulting, with episodic movements along the faults from the Late Cretaceous to the Late Tertiary. Faults forming the traps for the gas have large throws from 50m to greater than 300m. Generally however, in PEL 84, the faults have smaller throws and are of a lesser extent. The sparse nature of the existing 2D seismic data, even when combined with the aeromagnetic data made it difficult to map the structure confidently.

No good, sizeable structures coincident with interpreted favourable reservoir development were mapped. Those that could be identified were small. Seismic attribute mapping did not show consistent trends, and thus either porosity trends or the presence of structurally confined porosity/fluid response could not be interpreted with any confidence.

The Top Pretty Hill horizon can be correlated locally with a high degree of confidence over the PEL 32 gas fields, however, further south and southeastwards away from the fields confidence becomes lower. This may be due to several causes such as lack of gas charge away from structures, possible deterioration of reservoir quality and certainly general decrease in data quality relating to complex faulting. Correctly identifying the Top Pretty Hill level is problematic, as there is a lack of significant reflector response below the Crayfish Unconformity on the majority of the reprocessed lines. Infill seismic lines would be necessary to try to obtain better images of the reservoir facies and also faults and their orientations. A couple of the lines from the Reynella Survey do indicate a number of potentially prospective fault block structures that would require more seismic data of better quality to bring the prospects to maturity.

For a more detailed discussion ensuing from the geophysical studies and to view corresponding maps please refer to Daryl Eyles' "PEL 84 Interpretation Report".

5.0 REPORTS SUBMITTED TO THE DESIGNATED AUTHORITY

Item	Date
PEL 84 Year One, First Quarter Report	June 12th, 2001
PEL 84 Year One, Second Quarter Report	September 21st, 2001
Otway Basin Permit PEL84 Reprocessing Report, by Robertson Research	October 24th, 2001
*Enhancement of Aeromagnetic Data over the Otway Basin, S.A. by Encom Technology Pty Ltd. - both hard copy and on CD ROM	June, 2001
*PEL 84 Interpretation Report, Incorporating Reprocessed 2D Seismic Data, by Daryl Eyles - both hard copy and on CD ROM	September, 2001

6.0 DATA SUBMITTED TO THE DESIGNATED AUTHORITY

Item	Date
SEGY exabyte tape 690FM005E, raw migrations and raw stacks and final migrations of 14 lines	October 24th, 2001
TAR exabyte, tape 690FD007E, final displays (CGM+ format) of 14 lines	October 24th, 2001
Paper prints of 14 seismic lines from PEL 84	November 14th, 2001

***Reports and data submitted with this report.**