Relinquishment Report

PEDL 136

Magellan Petroleum (UK) Limited **September 2010**

Licence Details

Licence Number :	PEDL 136
Licence Round :	UK 12th Onshore Licensing Round
Effective Date:	1 October 2004
Licence Type :	Petroleum Exploration and Development Licence (Onshore)
Block Number :	UK National Grid Blocks TQ 05 and 15
Operator :	Magellan Petroleum (UK) Limited (100%)
Work Programme :	Acquire 50 kms of existing 2D seismic data over the Licence's area, drill-or-drop election to be made within the Licence's initial term

Introduction

PEDL136 is located north of the northern margin of the Weald Basin, in the county of Surrey. The licence was awarded in October 2004. The Determination of PEDL 136 was made by the Secretary of State with effect at the end of its 6-year initial term on 30 September 2010.

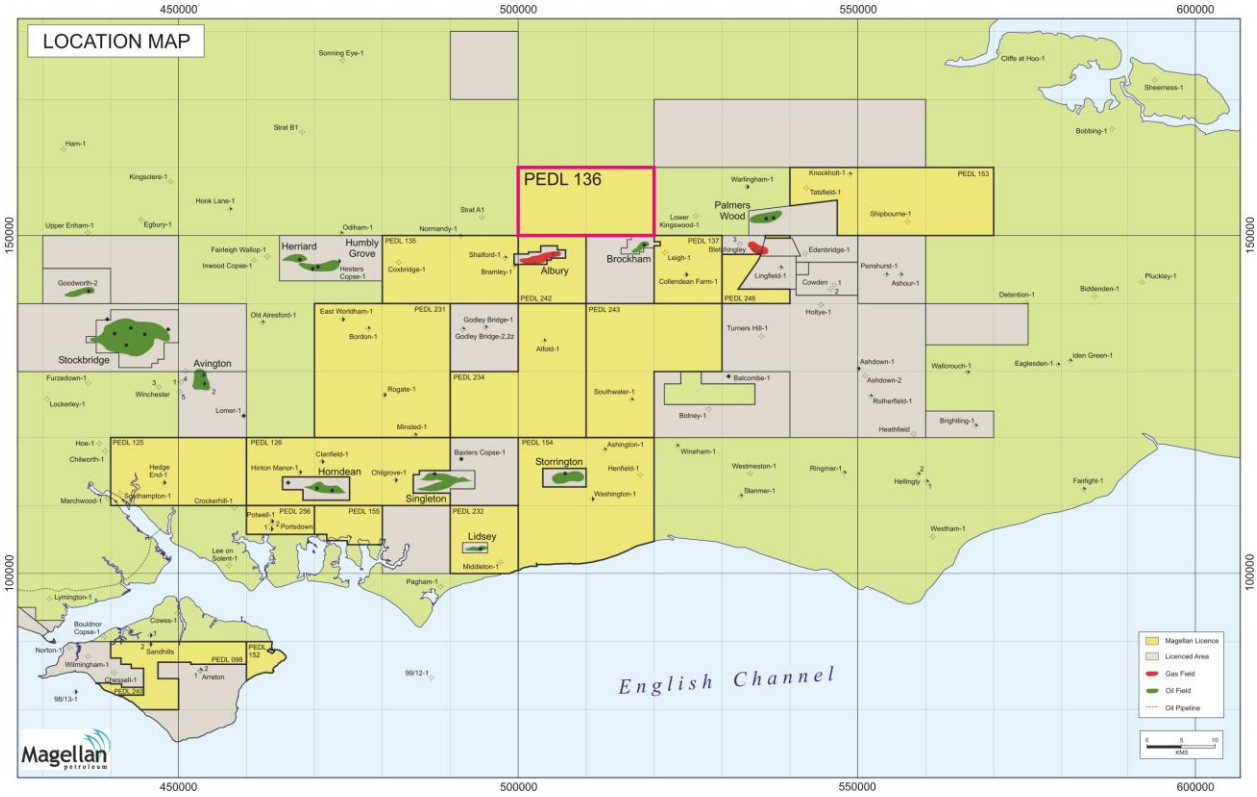

Figure 1: PEDL 153 Location Map

This report is a review of the work carried out by Magellan. As part of this work a full prospectivity study was undertaken and in the light of this work Magellan has decided to relinquish the PEDL 136 Licence in its entirety since it now considers there are no economic prospects within the Licence area.

Exploration Activities

Following award of the Licence Magellan has acquired all of the existing 2D seismic data over PEDL 136 (ca. 256 km, Fig. 2) and a significant amount of data in the surrounding areas in order to directly tie the data and to carry out a full evaluation of the Licence within a regional context. The data purchased fulfilled the work commitment on the Licence.

After an initial data review Magellan decided to reprocess all the existing seismic data and this results in a significant improvement in data quality. The data had been acquired in 8 campaigns with different acquisition parameters, processing routines, and statics algorithms along with different datums. The reprocessing resolved many of these problems with particular emphasis on the statics. Magellan has provided copies of the final reprocessed lines to the UK Onshore Geophysical Library (UKOGL).

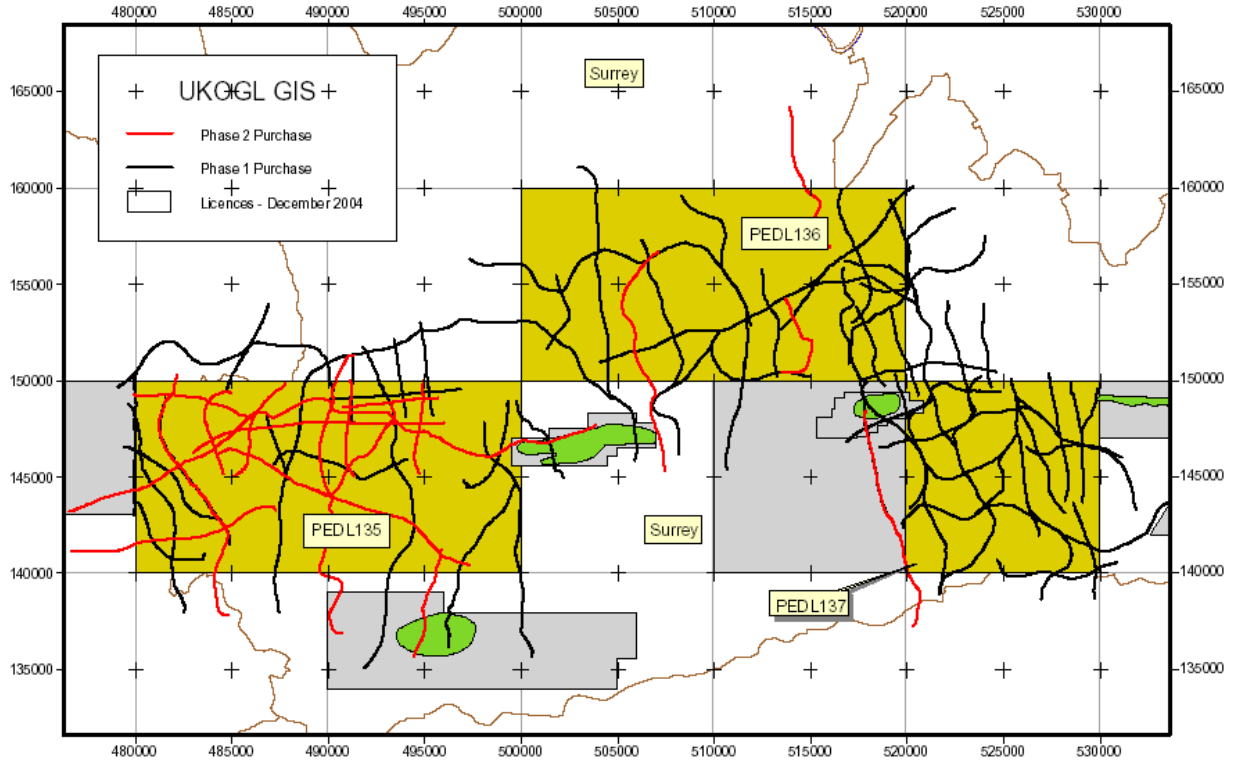

Figure 2: PEDL136 Seismic Database

The interpretation of the reprocessed seismic was carried out as part of a project with data from adjacent licences PEDL 135 and 137 that are also operated by Magellan. This allowed seismic events to be tied to the existing well control.

Although no wells have been drilled in the Licence Magellan purchased all the available well data in the area. All information was scanned and where necessary digitised to create a digital database. Previous operators were approached in order to acquire reports on all the studies that have been carried out in the wells, and in particular sedimentological or geochemical studies. All this collected data has been compiled in the digital database.

A full evaluation of the petroleum geology of the area was carried with study of all the reservoir, source and seal intervals created. Detailed analysis of the reservoir intervals in all the wells were carried out in

order to create a series of regional reservoir fairway maps. Samples of oils from producing fields in the region were analysed and this together with maturity modelling work allowed a petroleum charge model for the area to be created.

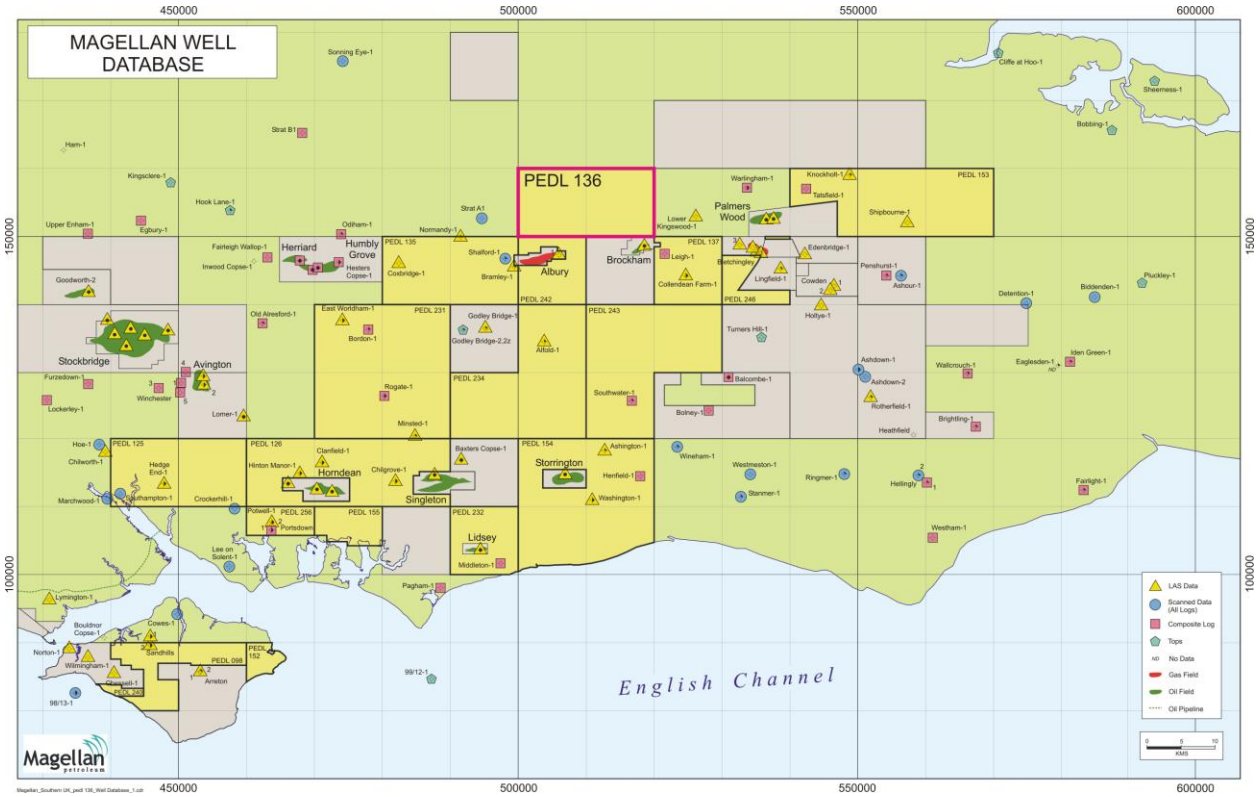

Figure 3: Magellan's Weald Well Database

Petroleum Geological Review

Results of Previous Exploration

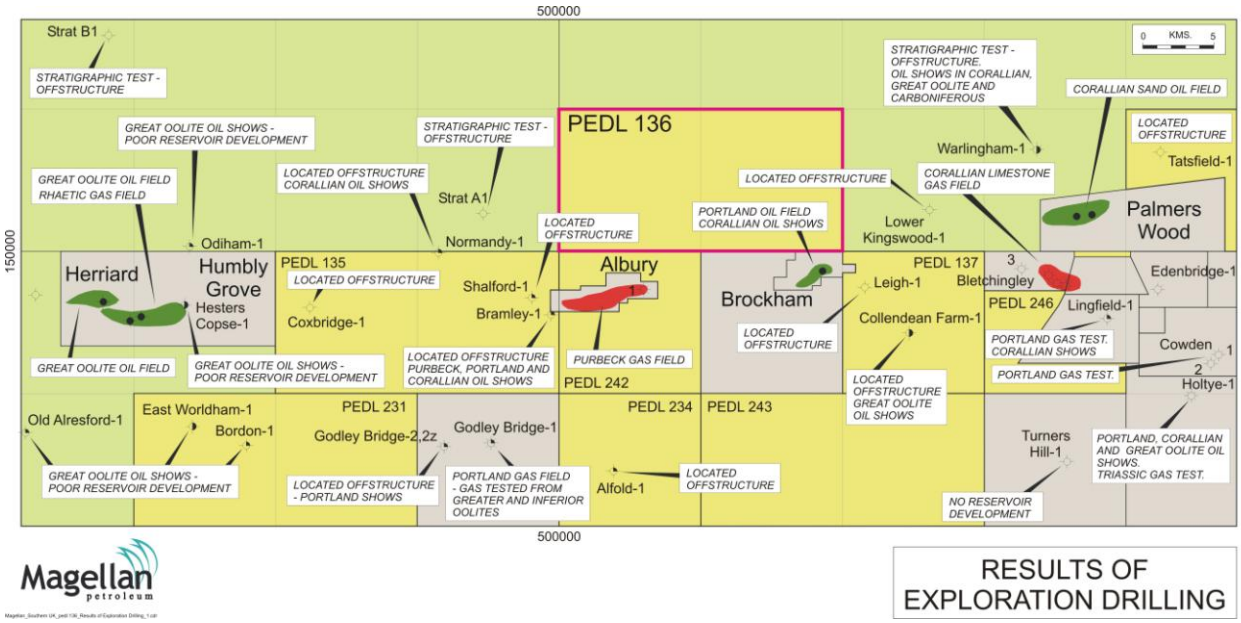

Figure 4: Exploration Drilling Results

No wells have been drilled in the licence however there are wells on trend that provide good geological control. To the east there is Lower Kingswood -1 and the wells in the Palmers Wood Field whilst to the west there are the Strat – A1 and Normandy – 1 wells. All the dry holes in the area appear to have failed due to being located offstructure.

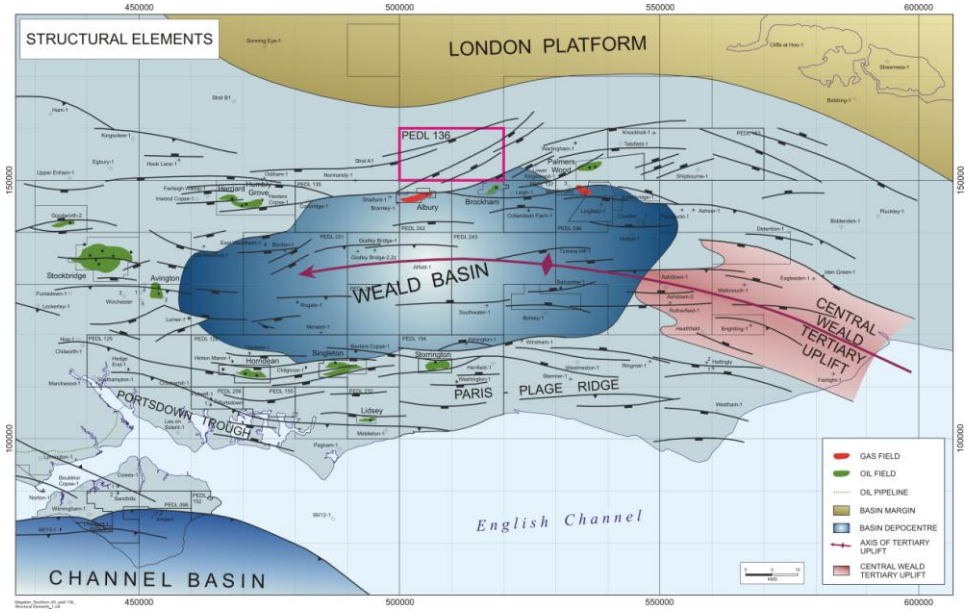

Figure 5: Structural Elements Map

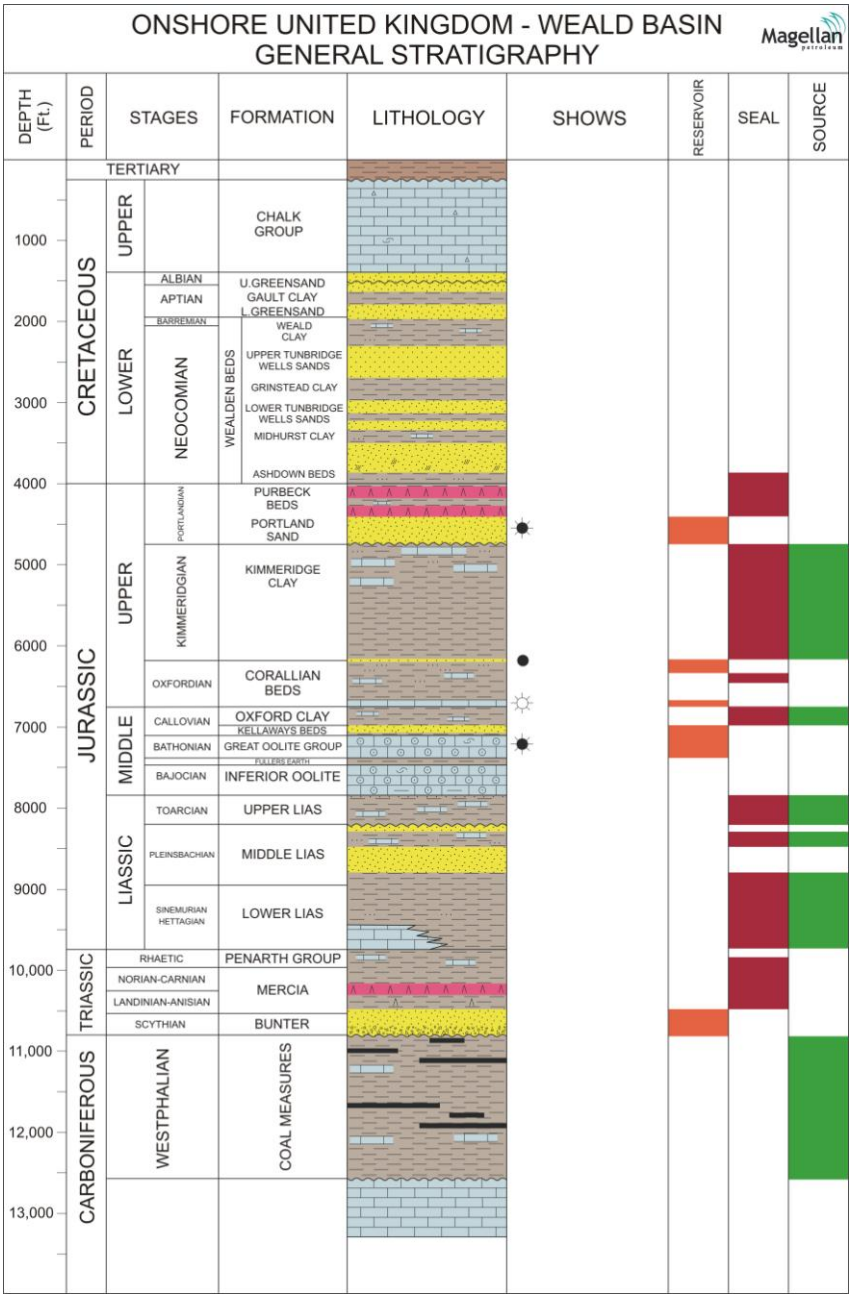

Figure 6: Stratigraphic Column

Reservoir Objectives

Portland Sandstone

The primary reservoir target are the Upper Jurassic Portland sandstones the reservoir in the Brockham oilfield and Godley Bridge gasfield. Good shows were seen in the nearby wells Bramley-1, Leigh-1, Collendean Farm-1, Shalford-1 and Baxters Copse-1 wells. The sands are of Upper Kimmeridgian to Portlandian age. The sands are believed to have been deposited in a lower – middle shoreface

environment. The interval is generally 20-40ft thick in the area but is expected to thicken in the southeast corner of the licence adjacent to the Hogs Back Fault system. Porosities are in the range of 12-29% with permeabilities of up to 550 md. Primary sorting is the principal control on reservoir characteristics. Early silica and carbonate cementation does result in a reduction of permeability. One problem is that the upper zone can be calcite cemented and may act in part as a waste zone. The overlying Purbeck Anhydrite which is up to 30ft thick seals the reservoir, although the interval pinches out along the northern edge of the licence.

Corallian Sandstone

A secondary reservoir target are the Upper Jurassic Corallian sandstones which is the reservoir in the Palmers Wood oilfield. Oil shows were seen in Normandy-1, Bramley-1, Collendean Farm-1, and Godley Bridge-1 wells. These sands are of Lower Kimmeridgian age and form an east-west trending thick across the licence. The sands consist of a stacked series of thin sand bodies, deposited as sub tidal sand waves in a mid shelf position. The sands appear to pinchout to the north and are thought to be up to 25ft thick to the south. Porosities are in the range of 7-20% with permeabilities of up to 180md. Reservoir characteristics are controlled by the sorting of the sands although meteoric carbonate cementation can be severe. Shales of the Upper Jurassic Kimmeridge Clay Formation, which are 250ft to 1700ft thick would provide a seal to the reservoir.

Great Oolite Limestone

An additional secondary reservoir target are the Middle Jurassic Great Oolite carbonates. This is the reservoir in the Humbly Grove, Herriard, Horndean, Storrington, Singleton and Stockbridge oilfields. Oil shows are seen in the nearby wells Collendean Farm-1, Godley Bridge-1, and Odiham-1 wells. The interval is of Bathonian to Lower Callovian age and was deposited in a shallow marine shoal environment. The interval thins from 100ft thick in the south, but pinches out to the north. The best reservoir characteristics are seen in the oolitic grainstone facies. These rocks are characterized by having high porosity but low permeabilities. The reservoir is sealed regionally by the Oxford Clay, a proven seal in the area which is 200-300ft thick.

The **Purbeck Sandstone** (reservoir in the Albury gasfield), **Corallian Limestone** (reservoir in the Bletchingley gasfield) and **Rhaetic Sandstone** (secondary reservoir in the Humbly Grove oilfield) are potential reservoir objectives in the area.

Source Potential

Liassic Shale

The primary source rocks in the basin are the Lower Jurassic Liassic shales, which are the proven source for the oil found in the producing fields in the Weald. Regional data indicates that the interval is well developed in the basin to the south. In the licence the interval pinches out to the north but reaches up to 750ft thick in the south. The interval is a good oil prone source with TOC of up to 2.4% and yields of up to 3.5kg/t.

Oxford Clay

An additional source interval will be the rich oil prone shales of the Lower Oxford Clay of Callovian age. Mapping reveals that this interval is most thickly developed to the south but is expected to be 200-300ft thick in the licence area. The shales have TOCs of up to 4.2% and yields of up to 4.4 kg/t.

Kimmeridge Clay

Shales of the Kimmeridge Clay interval are an extremely rich oil prone source rock and are up to 2,000ft thick in the basin centre. The oil in Balcombe-1 is thought to have been generated from this interval but due to the restricted area of mature source this source rock is not thought to be an important source contributor.

Palaeozoic source

Potential source rocks may exist in the Palaeozoic interval but their distribution in the subsurface is poorly known. Much of the gas seen along the northern flank of the basin, as for example the gas bearing Rhaetic sands at Humbly Grove, are thought to be sourced from the Palaeozoic.

Maturity, Timing and Migration

The widespread presence of oil and gas in the area points to oil and gas generation in the area. Maturity data has shown the presence of a major oil kitchen, in the Weald Basin, centred to the south of the licence. Modelling has shown that the Liassic shales would have started oil generation below 6000ft during the Lower Cretaceous, with peak generation commencing in the Upper Cretaceous. Generation is thought to have ended with the Alpine inversion movements of the Miocene. Charge in the are is therefore reliant on lateral northerly migration out of the basin using one of the Jurassic carrier beds. The main carrier bed in the area is the Great Oolite limestone beneath the Oxford Clay regional seal. Migration into the shallower Corallian and Portland carrier beds is dependant on breaking the thick Oxford Clay and Kimmeridge Clay regional seals. This is most easily achieved by faulting probably along the Hogs Back Fault System. Migration northwards would then be achieved via fill and spill mechanisms, however an effective charge into the northern shelf is unproven.

Play and Risk Analysis

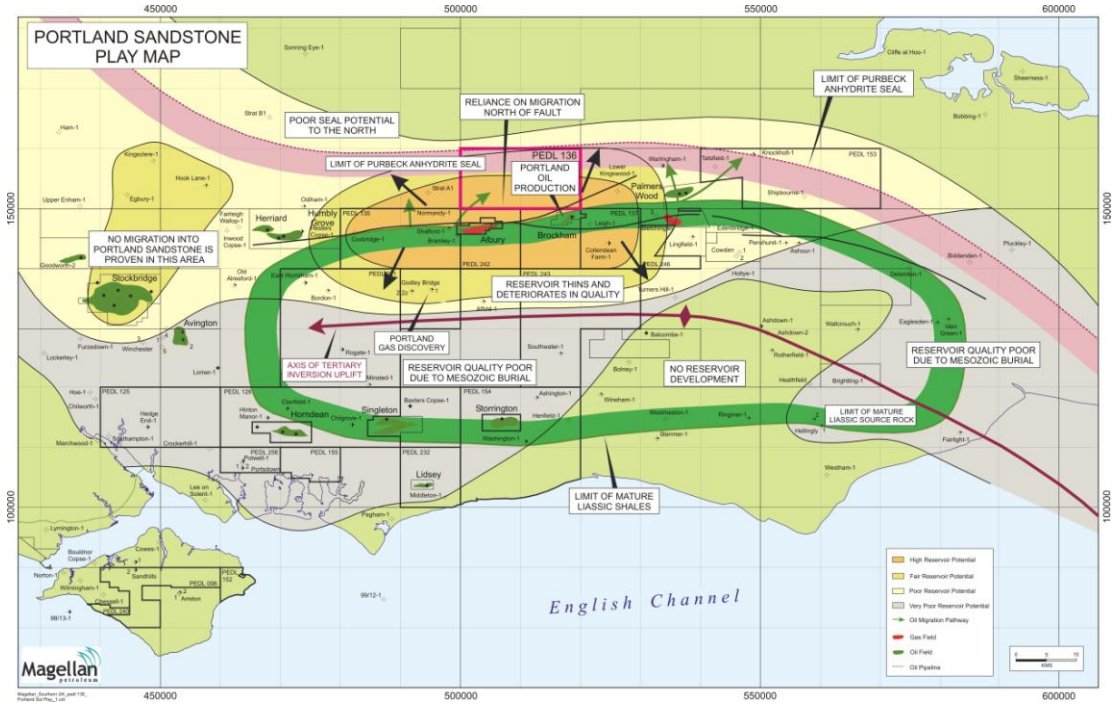

Figure 7: Portland Sandstone Play Map

Magellan created a series of regional play maps for all the Jurassic reservoir targets. The play map for the Portland sandstone reservoir is illustrated in Figure 7. This work also allowed the main risks to be recognized in the basin. In PEDL 136 the main risks were identified as charge and the presence of large structural traps, as shown in Figure 8.

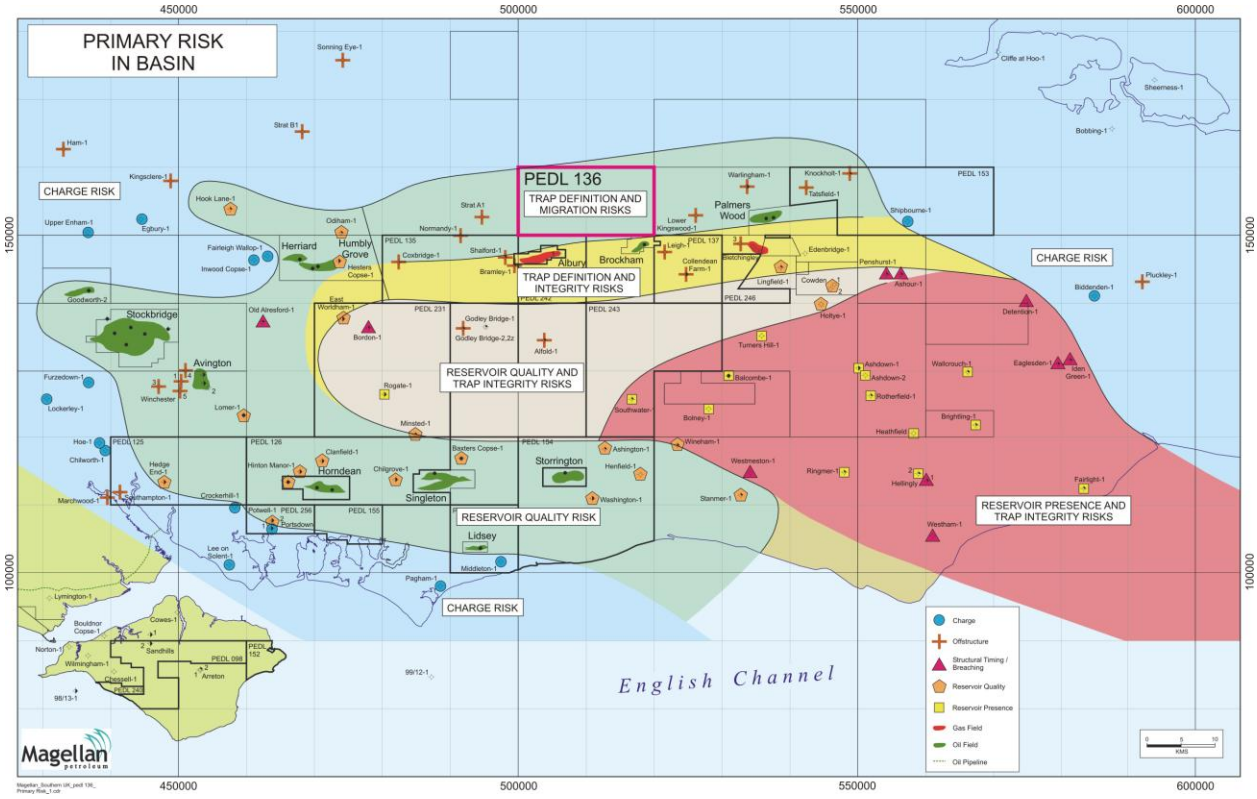

Figure 8: Weald Basin Principal Risk Map

Prospectivity Review

The area was initially mapped for the original licence application. This work confirmed the work done earlier by Conoco which identified two main leads at Box and Effingham as shown in Figure 9. It should be remembered that the mapping that was carried out relied on the original unreprocessed seismic which suffered from severe misties. Furthermore, due to the built up nature of the area the seismic suffers from extensive omissions thus creating large gaps in the data. Since the objectives lie at shallow depth these omissions are a major problem.

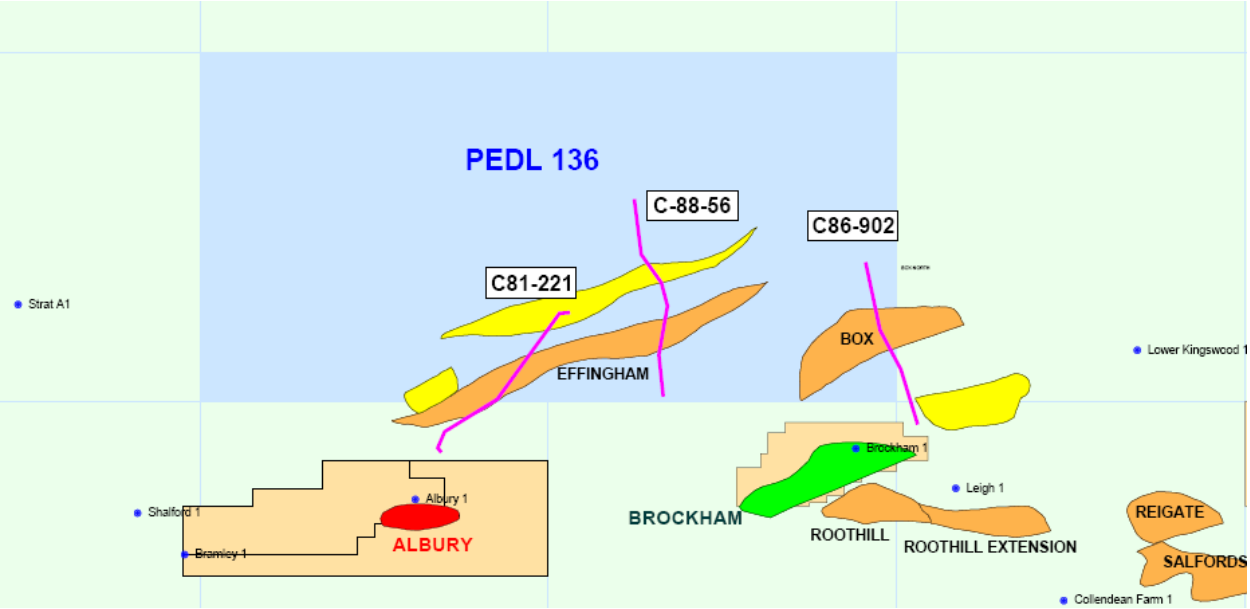

Figure 9: Identified Leads at Application

The map produced by Magellan using the new reprocessed seismic data is shown in Figure 10.

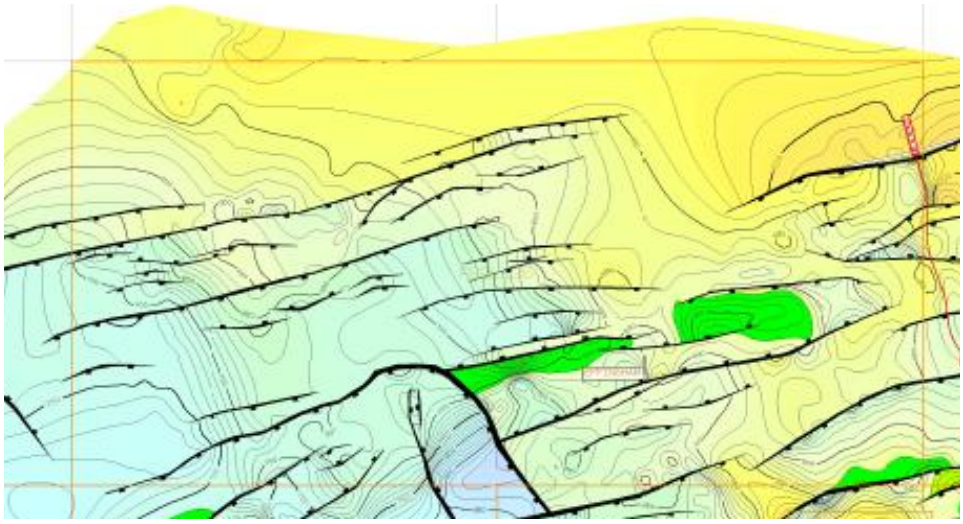

Figure 10: PEDL 136 - Top Purbeck Anhydrite Depth Map

Based on Magellan's interpretation of the reprocessed seismic a series of time and depth maps were created at the prospective horizons; Top Purbeck Anhydrite, Top Corallian Limestone and Top Middle Jurassic carbonate. Figure 10 shows the Top Purbeck Anhydrite map in PEDL 136. The Purbeck Anhydrite event lies just above the top of the Portland reservoir and can be reliably picked throughout the dataset. The interpretation shows the presence of northeast-southwest trending block faulting crossing the licence however no significantly sized closed structures have been recognised. The leads identified in the earlier interpretation are much reduced in size. The big difference between the two interpretations is the extent of the northeast-southwest trending bounding faults of the structures. The recent work has shown that the faults are not as extensive as previously thought and therefore the leads have a more limited extent. Many of the faults recognised in the previous interpretation suffered from faults being recognised where omissions were prevalent. Also static problems had resulted in the wrong event being tied between seismic lines of different vintages. The conclusion of this work is that no economically viable prospects exist in PEDL 136.

Clearance

Magellan confirms that DECC is free to publish this report. All third party ownership rights on the contained data and interpretations have been considered and appropriately cleared for publication purposes.