1. General

Licence: P.185
Round: 4th (1972)
Licence Type: Traditional
Blocks: 30/11b (part) and 30/12b (part)
Equity: Talisman Sinopec Energy UK Limited 60%, Centrica North Sea Oil Limited 40%
Work Programme: Fulfilled

2. Licence History

Figure 1: Location map of P.185, Blocks 30/11b and 30/12b

Block 30/11 (P.011) was initially awarded to Shell in the 1st Licensing Round in 1964 while, at the same time, Block 30/12 (P.032) was awarded to Gulf Oil. In 1970, both blocks were partially relinquished. The relinquished acreage became Blocks 30/11b and 30/12b.

Following the 4th Licence Round in 1972, Blocks 30/11b and 30/12b were awarded as part of Licence P.185 to an Amoco-led group. Amoco retained the blocks until 1999. Amerada Hess took over operatorship of Block 30/11b in 1999, and Venture subsequently took over operatorship in 2005. Talisman entered Blocks 30/12b (60%), 30/11b-F1 (Fulmar) and 30/11b-F2 (Halley) in December 1999, taking over operatorship of 30/12b. In February 2010, Talisman took a 60% stake in block
3. Exploration Activities

Well 30/11b-1 (Amoco, 1979), the first well drilled on blocks 30/11b and 30/12b, proved unsuccessful albeit with oil shows in the Chalk.

The next well, 30/12b-2 (Amoco, 1980), the Halley Alpha discovery, tested oil from the Upper Jurassic Fulmar and Ribble sands in a downthrown Halley terrace to the north of the Fulmar Field. The next Halley terraces well, 30/12b-3 (Amoco, 1981), was dry, having been drilled outside structural closure.

The Halley Beta discovery well, 30/12b-4 (Amoco 1985), tested oil from Fulmar and Ribble sands. Fluid and pressure data indicated that this was a separate accumulation to the Halley Alpha discovery. Further appraisal drilling at Halley was put on hold until after the acquisition and interpretation of 3D seismic in 1993.

In the interim, in block 30/11b, well 30/11b-3 (Amoco, 1993) discovered and tested a HPHT gas/condensate accumulation in the Appleton Alpha fault terrace.

Drilling recommenced at Halley in 1994. The 30/12b-6 well (Amoco, 1994) tested oil from the Fulmar sands in the Halley Gamma terrace. In the same year, Amoco drilled the 30/12b-7 well and encountered oil shows, but a lack of good quality reservoir, in the Upper Jurassic in the northern part of Block 30/12b.

The Halley Beta appraisal well, 30/12b-8 (Amoco 1996), tested oil from the Fulmar sands in the same pressure compartment as the 30/12b-4 well. The Halley Beta Field was subsequently developed with long-reach deviated wells drilled from the Fulmar platform, and was initially put on production in 2002.

Well 30/11b-4 (Amoco, 1997) was suspended as the Appleton Beta oil and gas discovery. In the following year, Amoco drilled Appleton Beta appraisal well 30/11b-5 but only encountered oil shows.

Well 30/12b-10 (Talisman, 2010), drilled on the Halley Delta terrace, encountered oil in thin Ribble sands and no hydrocarbons in the Fulmar Formation, due to the apparent lack of a valid trap.

Of the above wells, only two were drilled in the relinquished acreage (30/11b-1 and 30/12b-7), and both of these wells only encountered hydrocarbon shows.

4. Prospectivity Analysis

All prospectivity within the blocks is within the Upper Jurassic Fulmar and subordinate Ribble sandstone reservoirs. The relinquished acreage contains three undrilled leads (Vulcan, Z and K) with Fulmar and/or Ribble prospectivity.

The late Oxfordian-early Kimmeridgian Fulmar sands were deposited in a shoreface-shelfal setting, whereas the slightly younger, late Kimmeridgian Ribble sands are interpreted as turbidite sands deposited in a deeper outer shelf to basinal setting.

Structurally, at pre-Cretaceous level, the 30/11b and 30/12b blocks are dominated by a series of roughly E-W striking fault terraces that down-step northwards from the Fulmar Field area into the West Central Graben (Figure 2).

The main Kimmeridge Clay Formation hydrocarbon kitchen areas are located in the basinal areas to the north and east of the blocks. Evidence from wells drilled on the
blocks demonstrates that there is an active petroleum system, and hydrocarbon charge is generally not considered to be a major risk associated with these blocks.

Figure 2: Interpreted seismic section from the Fulmar Field northeastswards across the Halley-Appleton fault terraces (Cornerstone seismic data courtesy of CGG)

Based on existing discoveries, the hydrocarbon fluids most likely to occur, in undrilled Upper Jurassic leads in the relinquished acreage, are volatile oil or gas/condensate.

4.1 Vulcan Lead

The Vulcan lead comprises a wedge of potential Ribble sands developed adjacent to a N-S oriented fault to the west. This potential wedge of Ribble turbidite sands is believed to be laterally equivalent to the thin ‘Ribble’ sand stringers encountered in the 30/11b-3 well above the Fulmar reservoir. Dip closure and stratigraphic pinch-out are expected to provide the trapping mechanism to the north, east and south, with fault closure to the west.
Figure 3: Vulcan lead - extent based on top to base ‘Ribble’ wedge sum of negative amplitudes from relative AI volume

Figure 4: Vulcan lead - west to east seismic line (relative AI volume) across the ‘Ribble’ wedge (red = low AI, blue = high AI)
4.2 Z Lead

The Z lead is a 2-way dip closure against the Monikie fault system to the west and a secondary E-W fault to the south. The reservoir expected in the lead comprises Fulmar sands, truncated beneath the BCU.

![Figure 5: Z lead - Top Fulmar Depth Structure Map](image)

4.3 K Lead

The K lead is a closure mapped at BCU level, located on a deep terrace northeast of Halley. Well 30/12b-7 penetrated a 500 ft thick Jurassic (and possibly older) section, which includes about 300 ft of poor reservoir quality sands with hydrocarbon shows. Despite the high water saturations, a possible ODT and WUT in the well can be recognised and used to determine P90 and P10 volumes. The remaining prospectivity in this lead requires an improvement in reservoir quality away from the
well location. Uncertainty exists as to the exact age of the lower part of the pre-Cretaceous section.

Topseal is provided by shales within the Kimmeridge Clay Formation (> 200 ft penetrated in the 30/12b-7 well), and also by the overlying argillaceous Cromer Knoll Group sediments (> 1000 ft).

![Figure 7: K lead - Top Fulmar Depth Structure Map](image)

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<th>Mean</th>
<th>P90</th>
<th>P50</th>
<th>P10</th>
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<tr>
<td>GIIP (bcf)</td>
<td>82</td>
<td>29</td>
<td>66</td>
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<tr>
<td>Reserves (mmboe)</td>
<td>14</td>
<td>5</td>
<td>11</td>
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Probabilistic volumetrics run for the Vulcan lead suggest that it could contain a mean GIIP of about 82 Bcf. The geological chance of success is thought to be approximately 23%. The main risk associated with the Vulcan lead is reservoir quality/performance, with trap definition and containment considered to be important secondary risks.
5.2 Z Lead

<table>
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<th>Mean</th>
<th>P90</th>
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<tr>
<td>STOIIP (mmbbl)</td>
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<td>22</td>
<td>40</td>
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<tr>
<td>Reserves (mmboe)</td>
<td>12</td>
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Probabilistic volumetrics run for the Z lead suggest that it could contain a mean STOIIP of about 24 MMbbl. The geological chance of success is thought to be approximately 21%. The main risk associated with the Z lead is reservoir quality, with migration and containment considered to be important secondary risks.

5.3 K Lead

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<th>Mean</th>
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<td>Reserves (mmboe)</td>
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Probabilistic volumetrics run for the K lead suggest that it could contain a mean STOIIP of about 45 MMbbl. The geological chance of success is thought to be approximately 17%. The main risk associated with the K lead is reservoir quality/performance, given the lack of viable reservoir in the 30/12b-7 well.

6. Clearance

Talisman-Sinopec Energy UK Limited, as the former operator of the relinquished parts of Blocks 30/11b and 30/12b, confirms that permission has been sought and gained from CGG to publish the seismic data images contained within this report.