

PL440 S

Relinquishment report

1 Key Licence History

Award and participants

PL440 S was awarded in the APA 2006 15 June 2007 to Det Norske Oljeselskap (30% and operator), Lundin (30%), Faroe Petroleum (20%) and Ener Petroleum (20%). The partnership has changed several times, and in 2010 Faroe Petroleum took over the operatorship of the licence. The partnership at the time of relinquishment was Faroe Petroleum (40% and operator), Dana (20%), Lundin (18%), Noreco (12%) and Det Norske Oljeselskap (10%).

Work obligations

The initial work obligations were to reprocess 3D seismic data within 2 years. Drill or Drop within 2 years. Decision on Continuation within 4 years and PDO within 6 years.

The licence was granted two extensions to these deadlines:

In 2009 the licence was granted a one year extension to DoD (2010-06-15) to run PDSM processing on seismic data to mitigate risk on the Clapton Prospect.

One year extension to BoV (2013-06-15) due to delays in release of drilling rig was granted in 2011.

All work obligations has been fulfilled within the updated deadlines.

Wells

One well (2/8-18 S) was drilled on the Clapton Prospect in 2012. The well was classified as dry.

Relinquishments

The initial area was partly relinquished in 2009, based on an updated prospect analysis where the Clapton Prospect was the only viable prospect within the licence.

The licence was finally surrendered due to lack of prospectivity following the dry 2/8-18 S Clapton well.

Meetings

2007-04-12 Pre-licence meeting

2007-11-07 Work Meeting - AutoImager discussion

2007-11-29 Management Committee Meeting - AutoImager decision

2008-04-14 Work Meeting

2008-06-13 Combined Exploration/Management Committee Meeting

2008-10-15 Management Committee Meeting

2009-03-03 Work Meeting - FP presents Clapton Prospect

2009-05-08 Work Meeting - Well ties, depth conversion, pressure, source, petrophysics. Decided to apply for licence extension

2009-06-05 Work Meeting - SIP PSDM

2009-08-19 Work Meeting - GA3DM08 proposed, CGG CBM

2009-10-22 - PSDM processing start-up meeting - CGG Veritas

2009-11-24 Management Committee Meeting - Petrel Model, volumes
2010-02-23 Work Meeting - Status PSDM
2010-03-02 Work Meeting- Status PSDM
2010-03-15 Work Meeting- Status PSDM
2010-04-16 Work Meeting - PSDM received, revised interpretation/model/volumes
2010-05-20 Work Meeting - Risking, volumes
2010-12-06 Management Committee Meeting - FP new operator, revised structural interpretation
2011-03-01 Exploration Committee Work Meeting - Well planning status, site survey
2011-04-06 Exploration Committee Work Meeting - Well location
2011-05-10 HAZID Meeting
2011-09-29 Exploration Committee Meeting - Clapton Geological programme
2012-02-16 Management Committee Meeting - Well planning status
2012-03-14 HAZOP-DWOP Meeting
2012-09-13 Exploration Committee Meeting - Well results
2013-03-06 Management Committee Meeting - Utsira evaluation, relinquishment recommendation

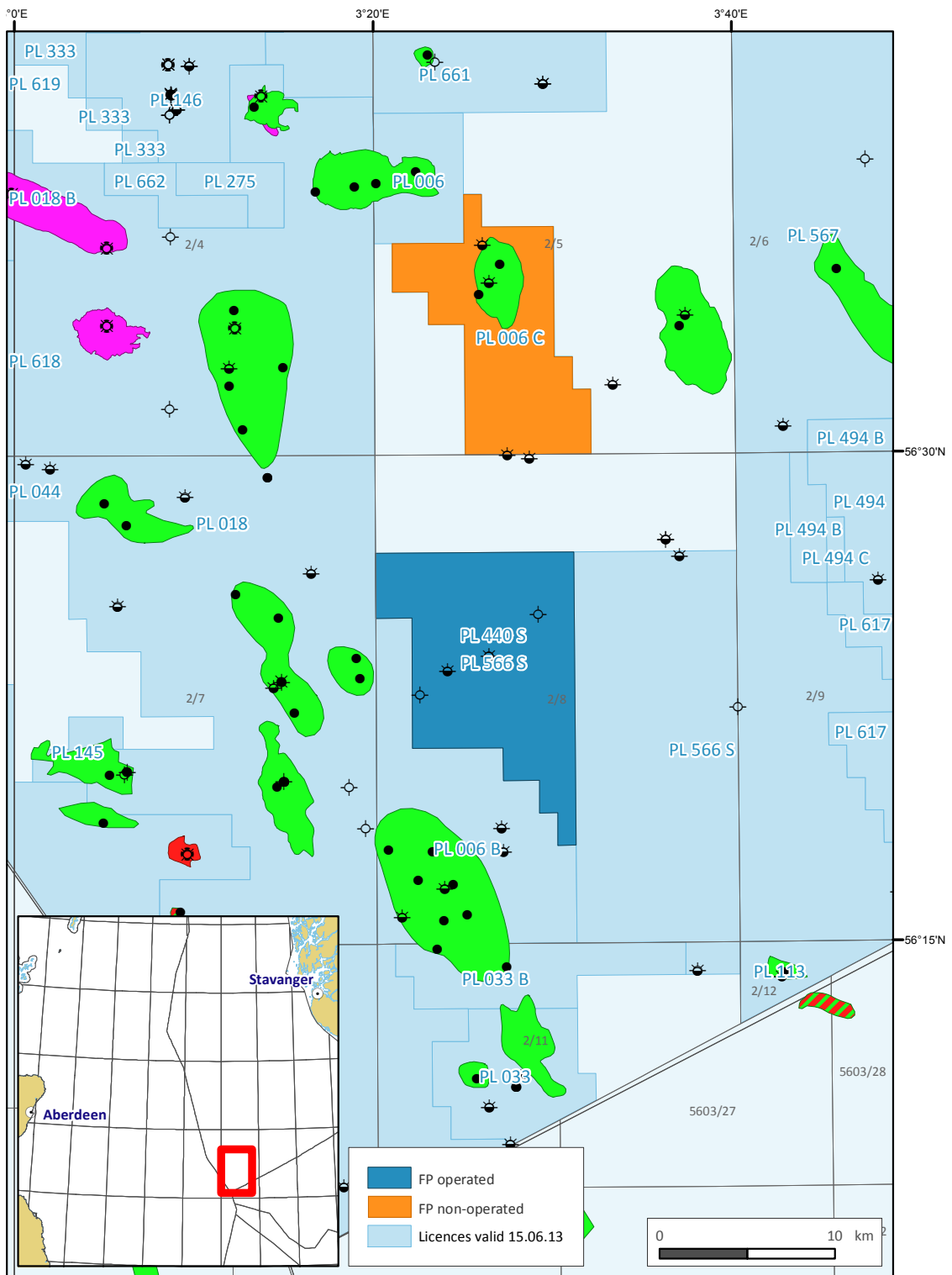


Fig. 1.1 PL440 S. Licence activity at time of relinquishment

2 Database

Seismic data

No new seismic data was acquired in the PL440 S licence. The main 3D seismic dataset was the GA3D-93, which was reprocessed twice.

The main existing datasets covering the licence is the GA3D-93 3D seismic survey.

A seismic merge was performed by PSS-Geo in 2008, resulting in the GA3DM08 dataset (input surveys: NH8702, GA3D, STTM-94, PN9401M, ANO9201).

400 km² of the GA3D-93 dataset was processed by Seismic Image Processing (SIP) in 2008 using the AutoImager technology for automatic velocity picking of gathers. The work was presented in a work meeting 2008-04-14. The resulting cube got the name GA3D-93R05-AutoImager.

CGG did a Controlled Beam Migration of the same dataset, that was delivered in 2010. This was made with the hope that it could resolve the imaging of the salt flank on the Mode Dome. The dataset is named DN10M01.

A site survey (FP1150) was performed prior to the drilling of the 2/8-18 S Clapton well. The site survey was performed by Fugro.

Well data

One well was drilled in the licence. The 2/8-18 S well was drilled on the Clapton Prospect.

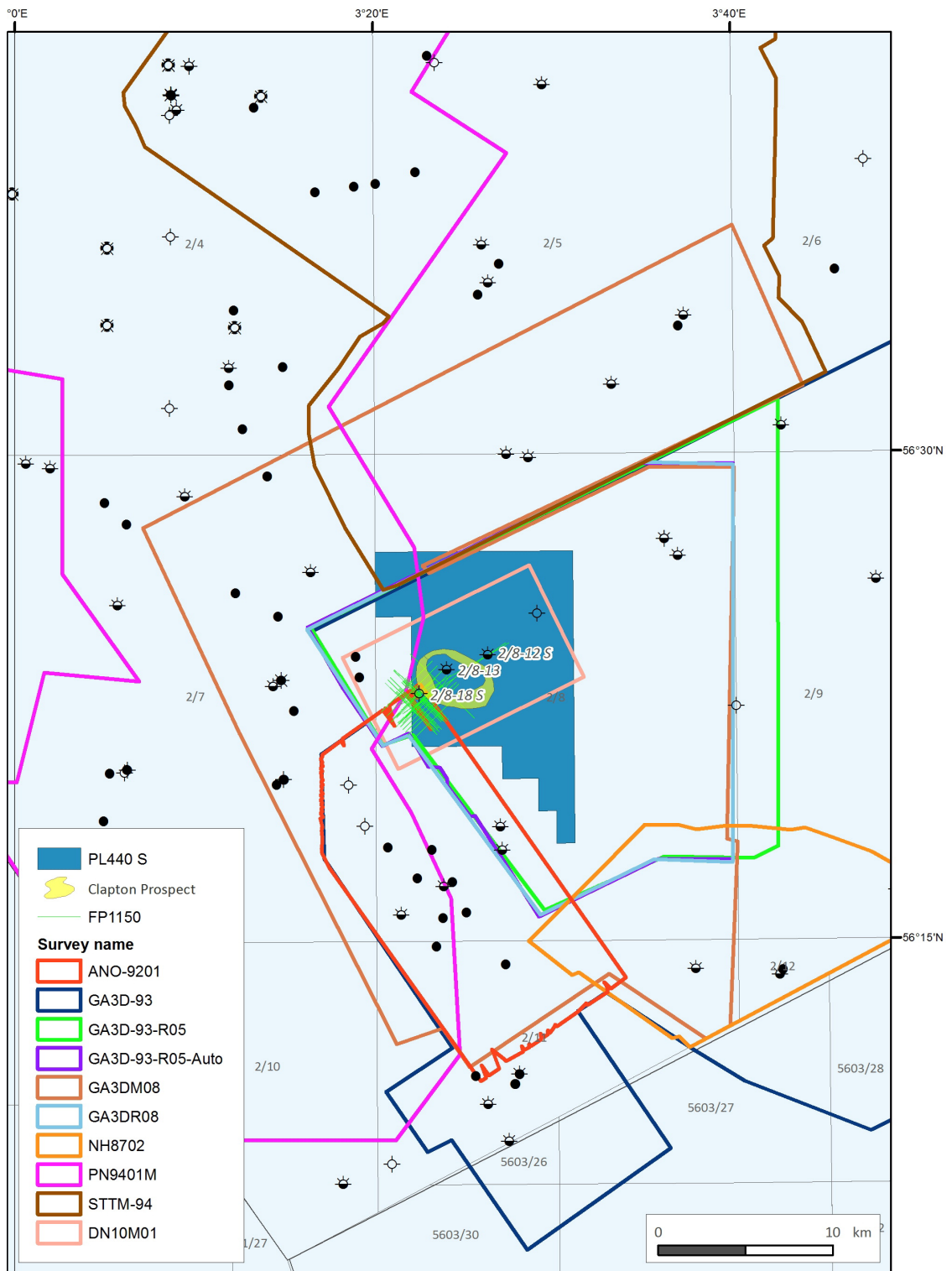


Fig. 2.1 Clapton seismic and well database

3 Review of geological framework

Several studies has been performed with the aim of mitigating risks, narrowing volumetric uncertainties and to generate and mature new prospects in the licence. None of these studies have significantly changed the view of the potential in the block, but has helped narrowing the volumetric range.

Clapton volumetric assessments

The recoverable reserves at the time of application had an estimated range of 2 (P90) - 8 (P50) - 15 (P10) MSm³ of oil, and a geological Chance of Success (GCoS) of 34%.

At the time of drilling, the latest estimate was 2 - 4 - 7 MSm³ and a GCoS of 26%.

Studies

Some of the studies performed includes (seismic reprocessing described in previous section):

Biostratigraphy study 2007. Wells 2/7-8, 2/7-15, 2/8-12 S, 2/8-13 and 2/8-15.

VSP analysis of the 2/8-12 S well.

Field analogue studies 2007. Seismic analysis/AVO feasibility studies.

Petrophysical analysis 2008. Wells 2/8-12 S and 2/8-15 T2.

Petrel Model of the Clapton Prospect initiated in 2008.

Fluid inclusion study by APT in 2008 (well 2/8-13)

Utsira prospectivity review 2013

4 Prospect update

The licence application from Faroe Petroleum contained one prospect (the Clapton Prospect) and two leads (the Cream and Ginger leads). The Cream lead was in Jurassic rocks, and hence below the stratigraphic border of the licence. The Ginger Lead has a very low volume potential, and would only be matured as a potential tie-in candidate in a Clapton success case.

Clapton Prospect description

The Clapton Prospect is located in Norwegian block 2/8, on the Mode Dome in the Central Graben. The prospect is a four-way dip-closed salt flank prospect with chalk reservoir. The reservoir does not extend over the crest of the structure, causing the prospect to have a donut shape, surrounding the central salt stock/diapir. Two wells have been drilled on the Mode Dome: The 2/8-12 S and 2/8-13 wells, drilled by Amoco in 1989. The 2/8-12 S well was drilled on the eastern side of the Mode Dome, targeting a Jurassic prospect, but was also drilled within closure at the chalk level. The 2/8-13 well was targeting the chalk over the crest of the structure. Only a very thin chalk was encountered, most likely a remnant rafted chalk, which is thought not to be in communication with the chalk section on the flanks of the salt structure. Underneath this thin chalk, salt was encountered. The Clapton Prospect is within chalk reservoir, updip of the 2/8-12 S well, and downdip of the salt and the 2/8-13 well. A seismic section and a geoseismic section are provided in Fig. 4.1, and a top Ekofisk depth map is shown in Fig. 4.2.

Trap

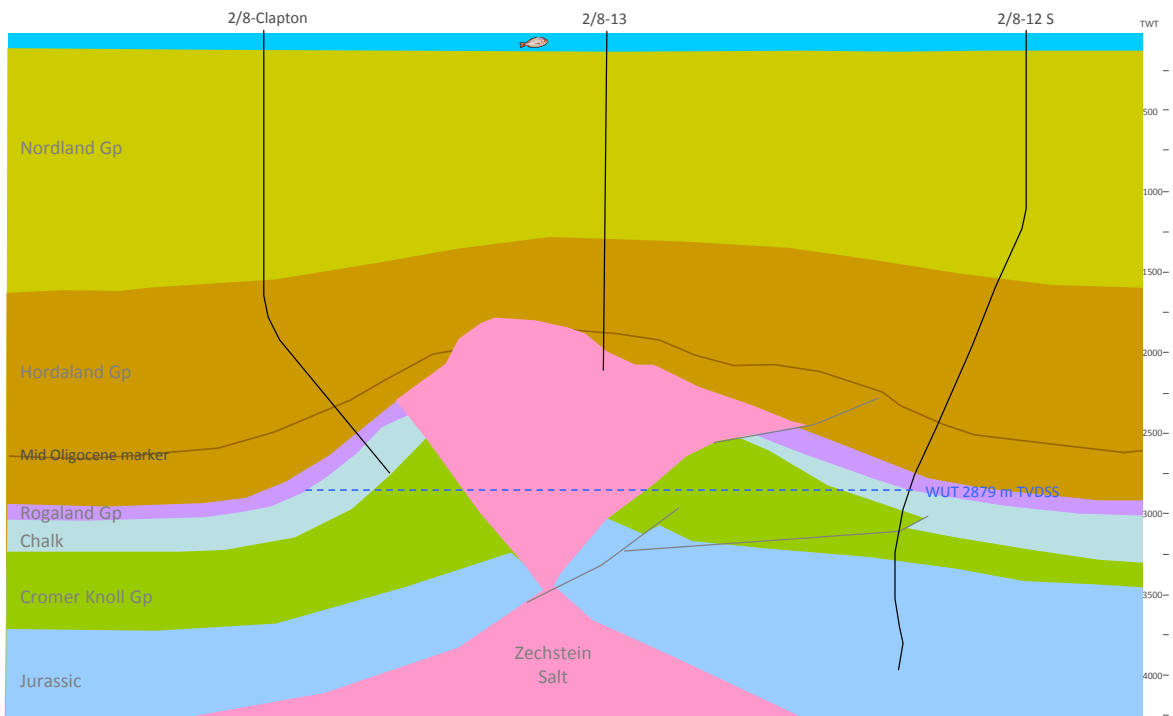
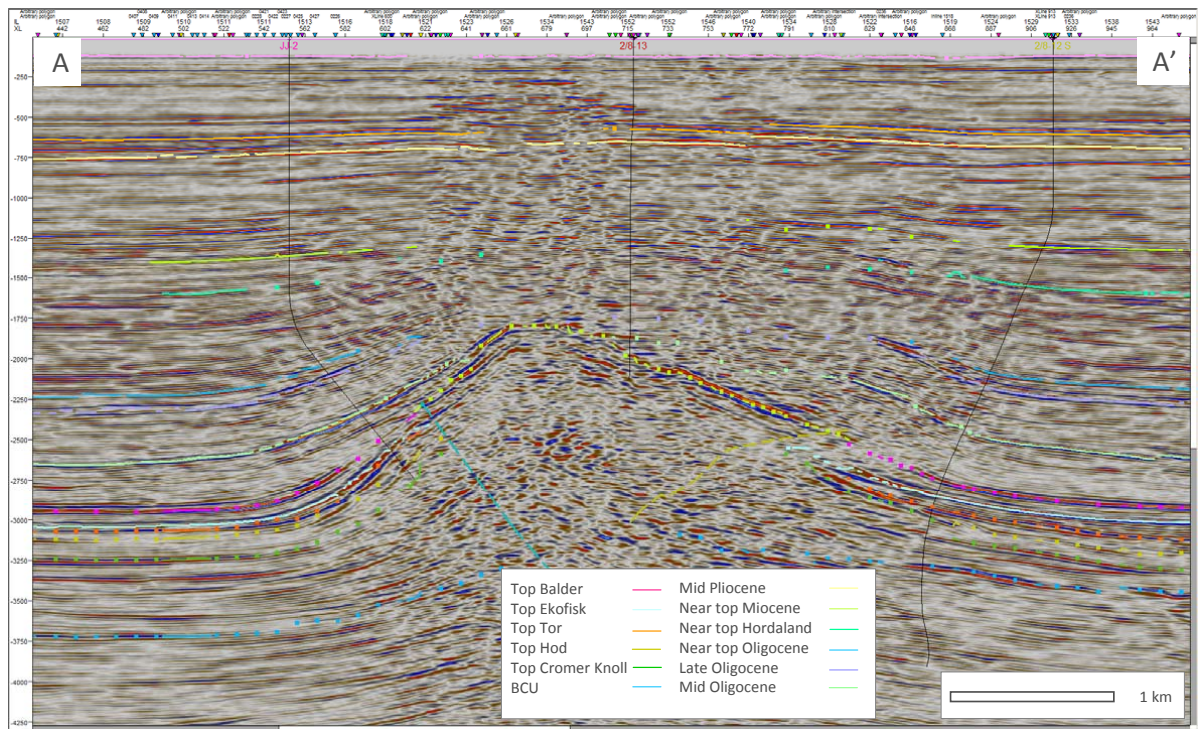


Fig. 4.1 Cross-section through the Clapton Prospect. Above: The seismic cross-section is aligned with the well paths of the planned Clapton well, the 2/8-13 and the 2/8-12 S well. Below: Geoseismic section showing the anticipated stratigraphy. The Water-up-to in the 2/8-12 S well is indicated. Please refer to the depth map for location.

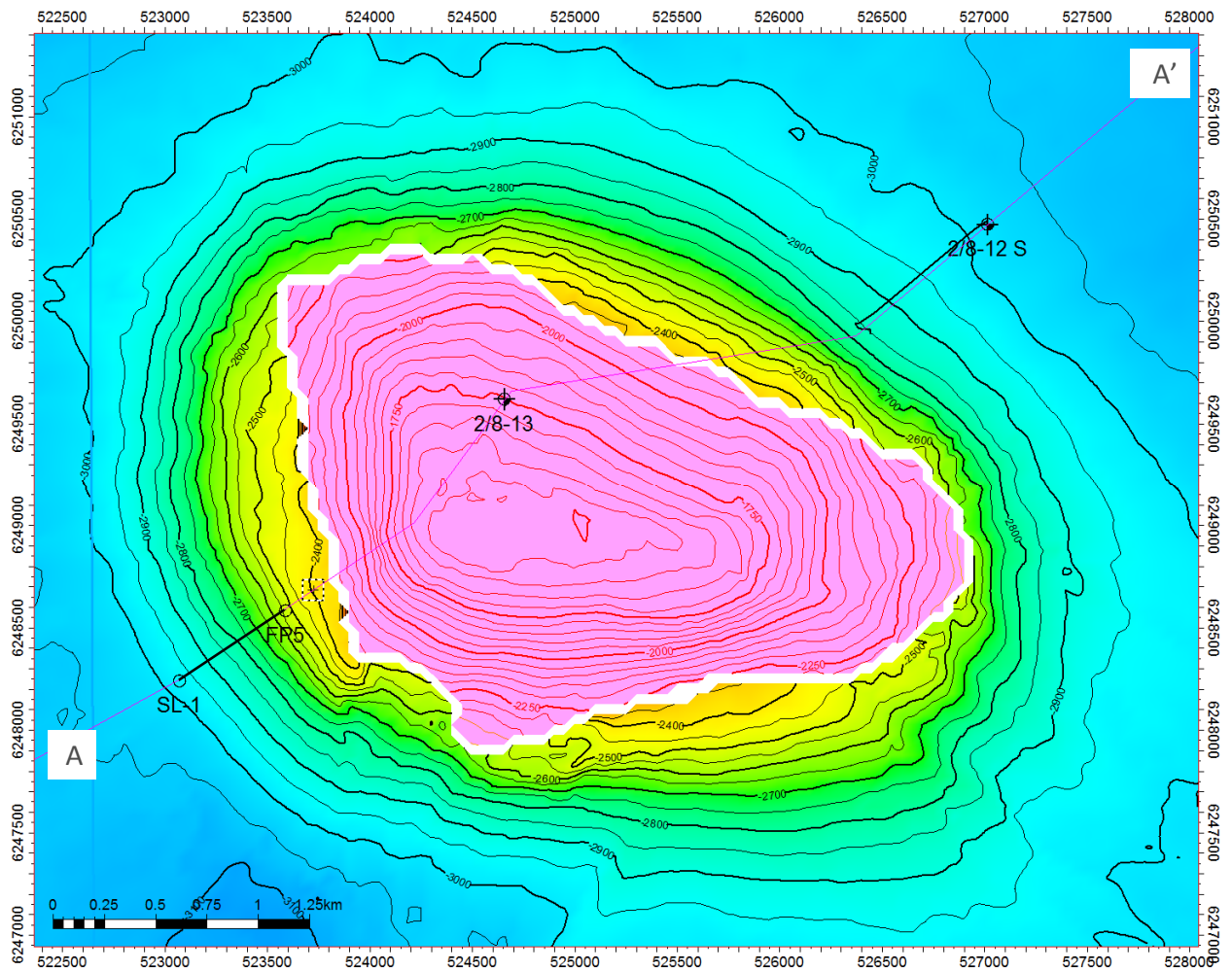


Fig. 4.2 Top Ekofisk depth map. The depth to top salt is indicated in pink colours. The two well locations SL-1 and FP-5 refers to the planned surface and target locations respectively.

The Clapton Prospect is a robust four-way dip closure (5.6 km²) defined at top Ekofisk Formation contained within a larger salt diapir related closure. The prospect area excludes the crest of the diapir, where no effective reservoir is present. The beds dip in excess of 40 degrees on the flank of the salt structure. A water-up-to (WUT) is defined by the water-bearing chalk in well 2/8-12 S at 2879 m TVDSS. The 2/8-13 well offers a good calibration of the diapir crest area, however it should be noted that almost no chalk field within the Norwegian Chalk Basin has a simple flat oil-water contact.

Seal

The seal represents one of the main risks on the prospect. The regional pressure picture indicates two possible water gradients, both suggesting an unbreached reservoir. Leak-off tests (LOT) in well 2/8-13 drilled on the crest of the diapir indicate a competent overburden. Geometry of the overhanging salt body gives additional seal potential. The risk is mainly related to dynamic seal in the overburden, periodically leaking hydrocarbons through a process called lateral transfer. The presence of a gas chimney does not necessarily represent a breached structure, as gas saturations of only 4% or more are enough to produce the characteristic seismic gas chimney signature and the surrounding chalk fields all have very large gas chimneys above the oil accumulations.

Reservoir

The expected chalk reservoirs in Clapton are the Ekofisk, Tor and Hod formations. These are all proven reservoirs, and are being produced in the adjacent fields. Regional isochron mapping indicates a high likelihood of a thick chalk section within the prospect, similar to the Eldfisk East Field. Amplitude mapping gives good indication of porous chalk up to and possibly within the prospect. Additional local reworking on the diapir flanks could give additional high porosity zones. Faults and fractures related to salt movement could enhance the effective permeabilities.

Well results - 2/8-18 S Clapton

The main reservoir was expected to be in the Tor Formation of the Shetland Group. The Tor Formation was interpreted to be thicker and more porous in the well location than elsewhere on the structure. The Ekofisk and Hod formations were considered to be secondary reservoirs in terms of matrix porosity. A dense small-scale fault pattern around the structure had been identified. It was expected that a dense system of open fractures was associated with these faults, and that these fractures would significantly enhance the effective permeability of the commonly tight chalk formations. This mechanism has been observed in nearby analogous chalk fields.

The main reservoir target was surprisingly encountered 20 m TVD shallow to prognosis at 2742 m MD, due to the Rogaland Group being significantly thinner than expected. The plan had been to set the 9 5/8" casing just above the reservoir to avoid potential high pressures in the reservoir. As it turned out, the reservoir pressures were low, and the casing could be set without problems.

Shows were encountered in the top reservoir, which triggered the decision to start coring. A 9 m core was cut in the Ekofisk Formation, showing good shows at the bottom. As the reservoir proved to be very competent, it was decided to run in with a 27 m core the second time. The second core had shows down to ca. 2763 m MD, then no shows. The base of the second core was in the Hod Formation, encountered ca. 100 m shallow to prognosis.

Apart from one major fault surface, no fractures were observed in the core. The reservoir was very homogeneous and tight. The LWD logs from the hydrocarbon bearing part of the reservoir confirmed very low hydrocarbon saturation (ca 20%).

The TD (Total Depth) of the well was planned in the Hidra Formation, at the base of the Shetland Group. This formation was also encountered nearly 100 m shallow of prognosis.

Interpretation and implications of well results

- The well was dry with minor shows. The interpretation is that the structure has been filled, but has leaked out due to seal failure. This was identified as the main risk.
- The top reservoir came in 20 m shallow to prognosis. This is interpreted to be caused by a fault offsetting the Lista Formation. It is believed that both the seismic interpretation and depth conversion of top reservoir is (broadly) correct.
- The reservoir sections were thinner than expected. This implies that our seismic interpretation of the intra-chalk horizons was wrong.

Based on the well results, there is a very limited remaining potential in the Mode Dome, as the expected reservoir was both considerably thinner and poorer developed than anticipated.

Other prospectivity

The shallow section above the Mode Dome is characterised by seismic disturbances caused by hydrocarbons (mostly gas) in smaller pockets. The 2/8-13 well however showed some indications of oil in a reservoir referred to as the Utsira Formation in the 2/8-13 Completion Report. The same reservoir was encountered in the 2/8-18 S well, with oil shows, but with very poor reservoir properties.

This observation of oil in the shallow section triggered a study on shallow pockets of oil in the shallow section (less than 1000 m TVD). The work was documented in the 2013-03-06 Management Committee Meeting. The conclusion was that any oil accumulation would be small, risky and difficult to produce.

5 Technical evaluation

Not applicable

6 Conclusions

There is abundance of hydrocarbons being generated in this area, as proven in the nearby wells. There were also shows in the 2/8-18 S well, both in the shallow section and in the main reservoir. The main problem is the reservoir and trapping mechanisms. The 2/8-12 S well had a Jurassic target, but did not find any reservoir in the Jurassic. One potential untested play model in the area is the Lower Cretaceous Ran sandstones. These could potentially exist in the Jurassic half graben on the western flank of the Mode Dome. As the PL440 S licence was restricted to the stratigraphy above the base of the Shetland Group, this play model was not matured.

The Clapton Prospect was the only remaining prospect in the licence before drilling the 2/8-18 S well. The disappointing well results is the main reason for relinquishing the licence.