

RELINQUISHMENT REPORT FOR LICENSE PL 792 IN BLOCK 6306/2

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Relinquishment Report of Licence PL 792 in Block 6306/2

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1 Key License History

Summary of award and participants

PL 792 was awarded on the 6th February 2015, following an application made in APA 2014. The licence group is as follows:

- Centrica Resources (Norge) AS: 50% (Operator)
- Faroe Petroleum Norge AS: 50%

Initial work obligations and work periods were:

- Acquire 3D seismic (2 years) 6th Feb 2017
- Drill or drop decision (2 years) 6th Feb 2017

All work commitments have been completed and are considered fulfilled for PL 792.

Overview of meetings held

Date Purpose		Comments		
15th April 2015 MC&EC, License Kick-off meeting H		Discussion on Common Database, Work program and proposed budgets, Handover from Faroe Petroleum's technical work during APA14		
26th November 2015	EC Work meeting	Update partners on work program status and consequences for prospectivity, way forward work program and future budget discussed		

Further correspondence was had between partners via L2S in absence of a requirement to conduct EC or MC meetings with no significant update on prospectivity.

Reason for relinquishment

The partnership has agreed to relinquish the licence due to a lack of prospectivity. Concepts in the main exploration plays identified during the APA 2014 license round on vintage 2D and 3D seismic data are not present when mapping was completed on newly acquired 3D seismic data. Additional study has also eliminated the likelihood of other untested plays being present in the licence area. Without any prospectivity of value, the partnership has elected to relinquish the licence.



2 DATABASE

License database

The common license database in PL 792 is part of a semi-regional database agreed between PL 792 and PL 749 partners. Data available for PL 749 was also used for the maturation of PL 792.

Seismic data

PL 792 is covered by the PGS14005 survey and the CE16M01 post-stack merged data-set. The regional mapping was completed on the CE16M01 (and its predecessor CE15M01) to place the license in a regional context. Mapping work which focused on maturing the PL 792 license area only was undertaken on the PGS14005 data-set. The area of the PGS14005 survey and the CE16M01 which is available to both partners is shown in Fig. 2.1.

- Main datasets used:
 - PGS14005 (Geostreamer)
 - CE15M01 post-stack merged dataset
- Other data available but not used extensively in Common Database Area
 - CE14001(Broadband and broad-source)
 - CN6306R97
 - SEN1101
 - PGS Megamerge and 2D of varying quality
- Much improved dataset to work with than available during the Round application (2D only over most of licence area)



Fig. 2.1 Seismic database

Well data

The common well database consisted of all released wells in the area at the time of license award and has been expanded as more wells have been released into the public domain. The Frøya High has seen active exploration drilling activity during the course of the license period. Every effort was taken to trade recently drilled wells deemed important to the license evaluation. Fig. 2.2 shows a summary of the key wells used in the technical evaluation.



Well Name	PL	Completion Date (NPD)	Data Status	Well Result	TD
6306/5-2	642	11.10.2015	Traded	Dry	Melke Fm
6407/10-5	793	19.09.2015	Traded	Dry	Late Jurassic
6406/12-3 A	586	22.07.2014	Traded	Oil/Gas	Melke Fm
6406/12-3 B	586	10.06.2014	Traded	Oil/Gas	Melke Fm
6406/12-3 S	586	24.04.2014	Traded	Oil/Gas	Melke Fm
6306/6-2	321	17.11.2009	Released	Weak Shows	Undiff. Basement
6306/5-1	197	10.07.1997	Released	Gas	Kvitnos Fm
6406/12-2	157	17.10.1995	Released	Dry	Melke Fm
6306/6-1	198	05.07.1994	Released	Dry	Undiff. Basement
6407/10-3	132	27.06.1992	Released	Shows	Undiff. Basement
6406/12-1 S	157	28.02.1991	Released	Shows	Melke Fm
6406/11-1 S	156	18.02.1991	Released	Oil	Triassic Red beds
6407/10-2	132	23.06.1990	Released	Shows	Tilje Fm
6407/10-1	132	19.06.1987	Released	Shows	Triassic Grey beds

Recent wells not included in common database

Well Name	PL	Completion Date (NPD)	Data Status	Well Result	TD
6407/10-4	700	20.01.2016	Not released	Dry	Undiff. basement
6406/12-5 S	586	12.11.2015	Not released	Dry	Melke Fm
6406/12-4 A	586	17.09.2015	Not released	Shows	Melke Fm
6406/12-4 S	586	17.08.2015	Not released	Oil	Melke Fm



Fig. 2.2 Well data. Red symbols highlight wells drilled during 2015 and 2016

3 Review of Geological Framework

PL 792 is located in block 6306/2 on the northwesternmargin of the Frøya High, south of the Halten Terrace. It is located 5 km southwest of the Pil and Bue discoveries and is located partly in the Rås Basin and partly on the western margin of the Frøya High. The main exploration play identified during APA 2014 was the Upper Jurassic Rogn and Melke Formations, interpreted as a southerly extension to the Pil and Bue plays. The leads identified in APA 2014 comprised of down-thrown fault blocks interpreted on 2D lines. The main lead identified was Slynge with a second lead referred to as Sprettert. A secondary play was identified within the Triassic, based on well correlation from the Draugen Field and well 6407/10-3. Leads identified were inferred to consist of deltaic to shallow marine sandstones mapped using RMS amplitude extractions at BCU to the north and south of the application area. Interpolation of the presence of these sandstone was completed without 3D coverage to well control.

A significant part of the application area was covered by only limited, poor quality, 2D seismic data. At the time of application, the main risks were viewed to be:

- trap definition due to the lack of 3D seismic data coverage
- poor reservoir quality due to the burial depth

The primary work programme was to license the PGS14005 3D seismic survey and carry out G&G studies. This survey, which also covers the Pil and Bue discoveries to the northeast, was used for mapping of prospective levels. Detailed mapping interpretations indicate that the prospectivity identified in APA 2014 are not present on 3D seismic data and are interpreted to have been mapped seismic artefacts on the steep fault scarp and canyons of the Klakk Fault Complex.

Summary of studies performed

Depositional Environments around the Frøya High - Geolink

Initial reconnaissance work on the PGS14005 indicated that reservoir presence was a key risk along the western flank of the Frøya High. Geolink completed independent regional mapping and well data interpretations to formulate new paleogeographical maps for the area. The findings of this study support the regional mapping undertaken by Centrica which indicates that the PL 792 area has little to no potential for reservoir presence. This is largely due to the area of interest along the Frøya High margin either being preserved as an erosional surface and/or a sediment starved bypass zone into the Rås basin for any sediments being reworked on the Frøya High. The sediment pathways are likely to be to the north and south of the PL 792 area.

Results of licence evaluation

None of the leads identified during APA 2014 have been confirmed on the current mapping on PGS14005. Any relief and topography along the Klakk fault and erosion area looks to be coincident with lineations within the basement which is likely to be consistent with sites of preferential erosion of fractures at the fault surface.



4 PROSPECTIVITY UPDATE

The initial work programme focused on regional mapping to:

- Link areas of well control in the Southern Halten Terrace and Frøya High to PL 792
- Update the understanding of the main structural elements controlling reservoir distribution at all play levels
- Enable correlation between significant seismic facies and unconformities across the Frøya High and into PL 792
- Improve understanding of prospectivity in PL 792

A number of key horizons were mapped across the region of interest, see Fig. 4.1. It is important to note that the Triassic basin identified on the eastern side of the Frøya High is truncated well before the PL 792 area and that the very steep Klakk Fault Complex does not contain fault block-type geometries beneath the BCU. The interpreted Jurassic package is located to the west of PL 792 and at considerable depth (in excess of 5.5 seconds TWT).



Fig. 4.1 Key seismic line from 6407/10-3 to PL 792

At the BCU level, detailed mapping shows the presence of regularly spaced "canyons" along the fault margin and a very steep slope of 15-25° present day, see Fig. 4.2. Observations from 2D and vintage 3D seismic showed a poor seismic response around the interpreted BCU reflector. This is in contrast to a very strong and consistent response when interpreting using the PGS14005 seismic data. Observations indicated that the BCU reflector was not optimally imaged on vintage data because of the steepness and complexity on the fault flank. Modelling studies undertaken for the PL 749 licence by CGG Veritas

centrica energi



Fig. 4.2 Top Base Cretaceous Uncomformity Map TWT

support this conclusion. Migration and ray tracing tests show that structures visible on 2D data at the BCU level are subject to out-of-plane effects caused by side-swipe from the elevated terrain surrounding the canyons. This gives the impression that there are packages of sediment in these canyons at the BCU level but these are not present on a continuous modern 3D dataset A comparison line between the 2D APA 2014 interpretation and the PGS14005 3D is shown in Fig. 4.3.

As a consequence, neither the Slynge nor Sprettert leads identified during APA 2014 are present on the updated mapping. This is supported by Geolink's paleogeography maps of the Melke and Rogn Formations, see Fig. 4.4. The findings of this study support the regional mapping undertaken by Centrica which indicates that the PL 792 area has little to no potential for reservoir presence. This is largely due to the area either being preserved as an erosional surface and/or a sediment starved bypass zone into the Rås Basin. The sediment pathways during the Upper Jurassic and Lower Cretaceous are likely to be to the north and south of the PL 792 area, see Fig. 4.5 and Fig. 4.6.

In addition, Triassic prospectivity identified in APA 2014 is now considered to be to the East and outside of the PL 792 license. RMS amplitudes identified on current mapping are consistent with a pinch out of Cretaceous shales across the apex of the paleo-footwall high (likely tuning effects).

No other viable prospectivity was defined in the basement, Cretaceous or Tertiary plays. This is largely due to a lack of trapping mechanism as the Frøya High rises continually to the East and a lack of reservoir presence in the license area.





Fig. 4.3 Comparison line between APA 2014 2D interpretation and PGS14005 interpretation. Clearly demonstrating that BCU is much more clearly defined on PGS14005 - structures in 2D not present in 3D





Fig. 4.4 Interpreted Melke, Rogn and Lange Fm paleogeography maps

- Lower Cretaceous prospectivity unproven in the area
- RGB blend mapping above the BCU indicates potential for some stratigraphic play within the Lower Cretaceous
- Two discrete systems appear to be present and match mapped within topographic lows consistent with the Klakk-Vingleia triple junction and the Hagar terrace
 - RMS amplitude mapping at BCU level suggests these systems were active during the Upper Jurassic
 - Very similar dimensions to bright mapped on BCU RMS amplitude map below BCU -100ms
- Majority of anomaly and potential crest of any trap lies to the north of the licence





Fig. 4.5 Interpreted position of Lower Cretaceous systems in PL 792



372000 368000 376000 380000 384000 388000 392000 396000 7108000 7108000 Southern ÷ Halten Terrace 106/12 BCU RMS amplitude maps 7104000 7104000 Klakk fault with a window -100 ms TWT zone Lower amplitudes associated with Halten Terrace 7100000 7100000 Frøya High appears to have noisy, chaotic response 7096000 No Jurassic thickness mapped – erosive channel 2 brighter areas which appear Frøya High Rås fan-like could be part of the system - eroding basin into different bedrock sediment transport system into 7092000 the Rås basin 709 Hagar terrace also shows **PL792** 7088000 7088000 limited RMS response No further Jurassic potential identified within PL792 7084000 7084000 Angle of slope too steep for sediments to settle – erosive surface 7080000 7080000 5kr 3 1 Northern edge of Hagar terrace 1:212391 Surface attribute 4800.00 3600.00 2400.00 1200.00 0.00 Frøya High 100 7076000 7076000 RMS amp Rås basin 5 Inferred sedir t movement 1:212391 11/19/2015 368000 372000 376000 380000 384000 388000 392000 396000

Fig. 4.6 Interpreted position of Upper Jurassic deep marine systems in PL 792



5 TECHNICAL EVALUATIONS

No prospectivity was identified during the work programme. Therefore, no technical evaluation was undertaken for the license.



6 Conclusions

There is not considered to be any remaining potential hydrocarbon value in PL 792 due to an absence of prospectivity. The partnership has therefore decided to hand back the licence to the authorities before the date of expiry of the end of the Drill or Drop period, 6th February 2017.