

License relinquishment report – Production License 438

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Introduction and geographic location

PL438 is located at the southern tip of the Loppa High stretching into the Hammerfest basin. The license group has through the license period had an extensive work program including acquisition of 3D seismic, seabed surveying and environmental studies. The evaluation of PL438 has resulted in a large prospect portfolio consisting of prospects in all geological time periods from Carboniferous to Tertiary. The license group agreed to drill a well in 2011, Skalle (7120/2-3S) which had Jurassic and Cretaceous targets. The well proved gas in three levels in the Kolmule Fm, the Knurr Fm and in the Stø Fm. The volumes of this discovery is estimated to be in the order of magnitude 2,5-8,0 Gsm³ (P90-P10).

Two discoveries, Gohta (2013) and Alta (2014) have been made just north of the license. These discoveries are in Palaeozoic carbonates and in Lr. Triassic conglomerates. The discoveries are very positive for the license in an economic way, as joint development solutions can be considered. The geological settings in these two discoveries can also to some degree be recognized in PL438.

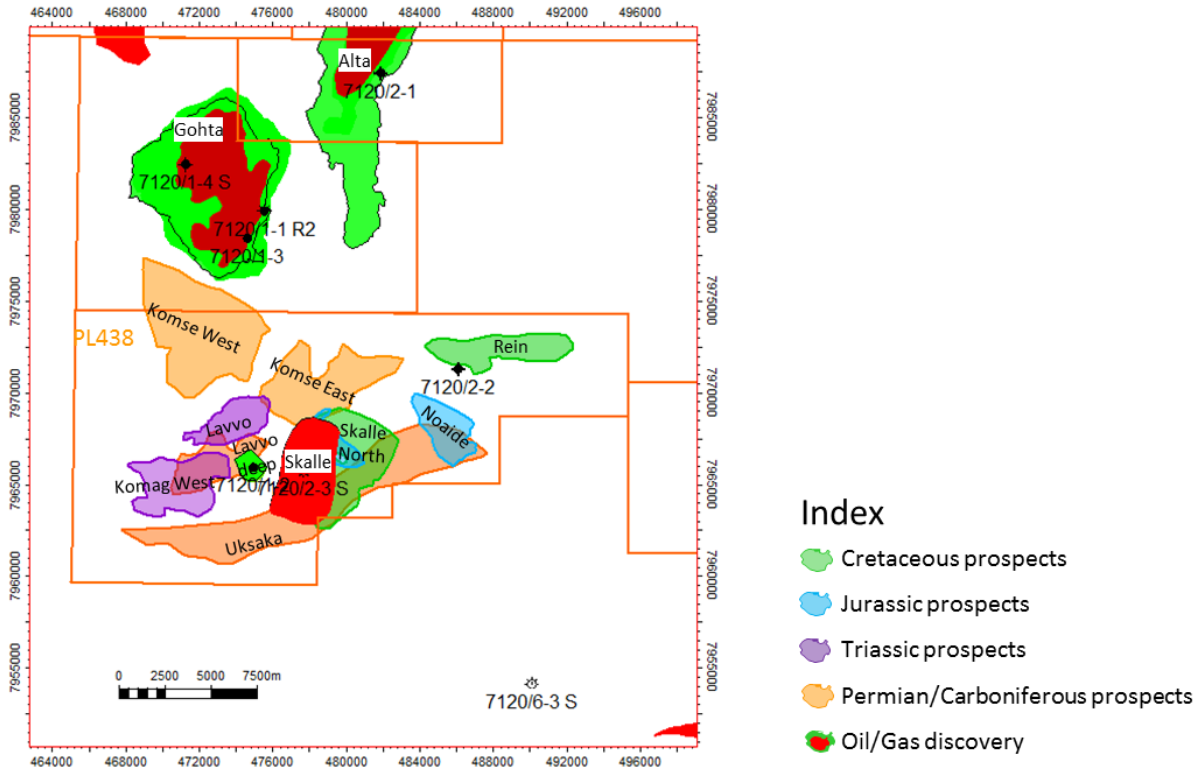


Figure 1. Map of prospects identified in the license (UTM zone 34). Note the Gohta and Alta discoveries to the North.

License award and period extension

The license was awarded in the APA2006 with a start-up 16th of February 2007. The original license group comprised Lundin Norway AS (operator, 35 %), Marathon Petroleum Norge AS (25 %), RWE Dea Norge AS (20 %) and Petoro AS (20 %). The original license area was 461,661 km². 124.4 km² of the south easternmost part relinquished in 2014. The current license group is Lundin Norway AS (operator, 25 %), Petoro AS (20 %), Dea Norge AS (20 %), Tullow Oil Norge AS (17,5 %), Det norske oljeselskap ASA (10 %) and Explora Petroleum AS (7,5 %). The license group has a deadline for decision to continue (BOV) 16/2-2016 and a deadline for plan for development and operation (PUD) until 16/2-2017. The initial period is extended until 16/2-2017.

Completed work and special studies

The work commitment was to acquire 3D seismic in the eastern parts of the license for then to decide if a well was to be drilled. Seismic was acquired and a well decision was made. A well was drilled in May to July 2011. The work commitment until BOV is thereby complete.

Pre-drill prospectivity evaluation

Seismic interpretation (both regionally and locally), geophysical and geochemical analysis and evaluation of prospectivity had been carried out previous to drilling the Skalle well in 2011. The objective of the well was to prove hydrocarbon filling in the primary target formations, the sandstones of the Stø and Kolmule formations. In addition it was an objective to investigate hydrocarbon filling in a number of secondary targets in the Knurr, Tubåen, Fruholmen and Snadd formations. An objective was to investigate the possibility of hydrocarbon filling below structural closure as a result of a combination of fault and stratigraphic seals. It was also important to investigate the possibility of hydrocarbon communication between the Skalle prospect and the Myrsildre discovery well (7129/1-2) see Figure 2.

Skalle (7120/2-3S) results

The well was drilled to a total depth of 2625 m MD RKB (2620.4 m TVD RKB). Well TD was set in the Snadd Formation. The well encountered the following hydrocarbon bearing zones:

- A gas column with a free gas-water contact in the Lower Cretaceous, Kolmule Formation
- Gas in a down-to situation in the Lower Cretaceous, Knurr Formation.
- A gas column with a free gas-water contact in the Lower to Middle Jurassic, Stø Formation.

The well proved the presence of reservoir quality formation in the Lower Cretaceous Kolmule Play for the first time, indicating a gross sandstone interval of approximately 150 m thickness. The interval is composed of several sandstone bodies with reservoir facies ranging from bioturbated shallow marine / shelfal sandstones to canyon fill conglomerates and clean homogenous slope turbidites. Sandstones with reservoir quality were also found in the Knurr Formation at the transition to the underlying Hekkingen Formation. The sandstones were found in a 5 m thick interval of partly carbonate cemented sandstones and shales.

Clean, 149 m thick, reservoir sandstones were found in the Stø Formation, but with a more marginal reservoir quality than the prognosis. This was probably due to a higher degree of quartz diagenesis than expected at this depth in the area. Sandstone reservoir units were also found in the Tubåen, Fruholmen and Snadd Formations. These reservoir units were also heavily affected by diagenesis. Reservoir pressures on the Skalle discovery were generally found to be close to hydrostatic, although slightly increasing with depth. After completing the data acquisition program the well was permanently plugged and abandoned.

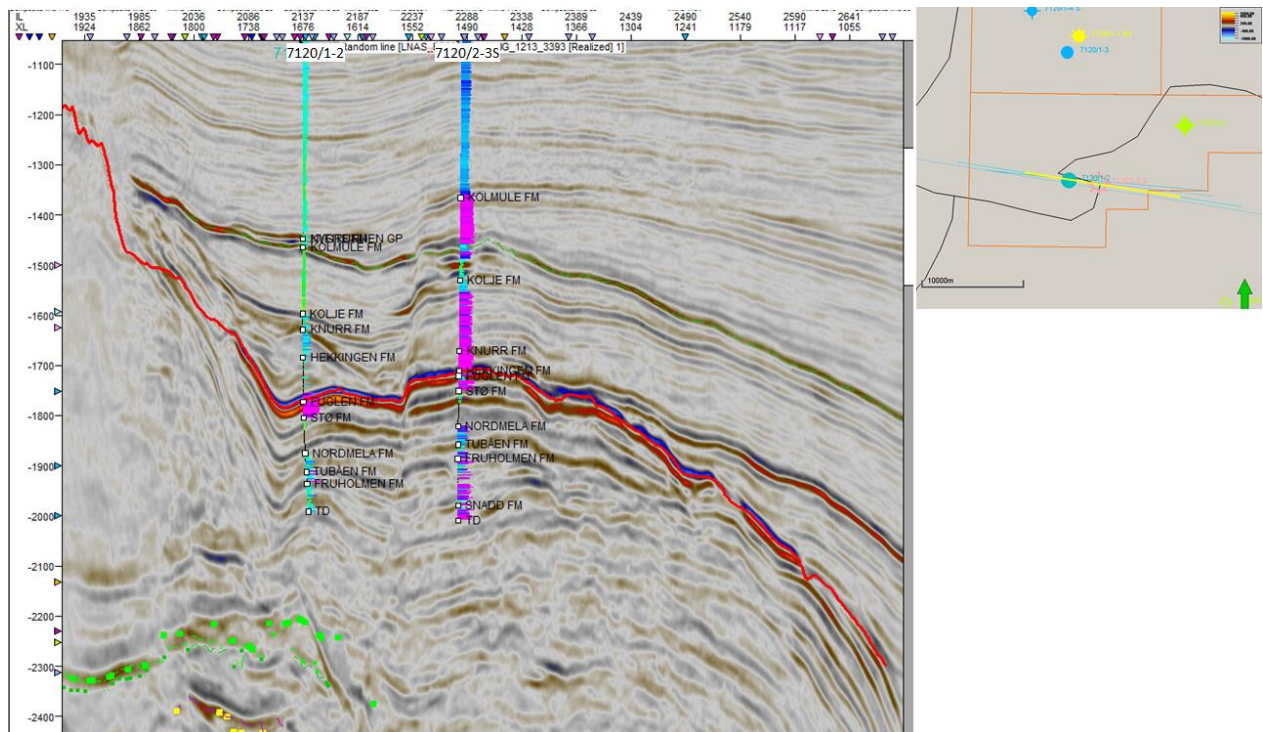


Figure 2. Seismic section through the 7120/1-2 and 7120/2-3S wells. The location of the seismic line is show as a yellow line on the map in the upper right corner.

Post-drill prospectivity evaluation

The Skalle gas discovery has been evaluated to not be commercial given the current technical and economic situation so the license group has continued searching for oil prospects. After the Gohta discovery in 2013, there has been increased focus in the license for looking at similar prospectivity in the PL438. A possible candidate for a karstified carbonate + conglomerate reservoir was found in the Komse West prospect which stretches into the PL492 license to the north. This prospect has similar areas of truncation by the end of the Permian to early Triassic. This setting is thought to be positive for the creation of karstification and for generation of short transported erosional material which can act as reservoir rocks. In addition oil mature source rock is thought to be present close to the prospect. The largest risk identified to this prospect is leakage across the fault towards north and into the Gohta discovery. A seismic reprocessing was performed with a goal to improve the seismic quality, especially in the deeper parts. New seismic interpretation was performed in order to map internal formations in the Palaeozoic and to derisk the fault leakage issue.

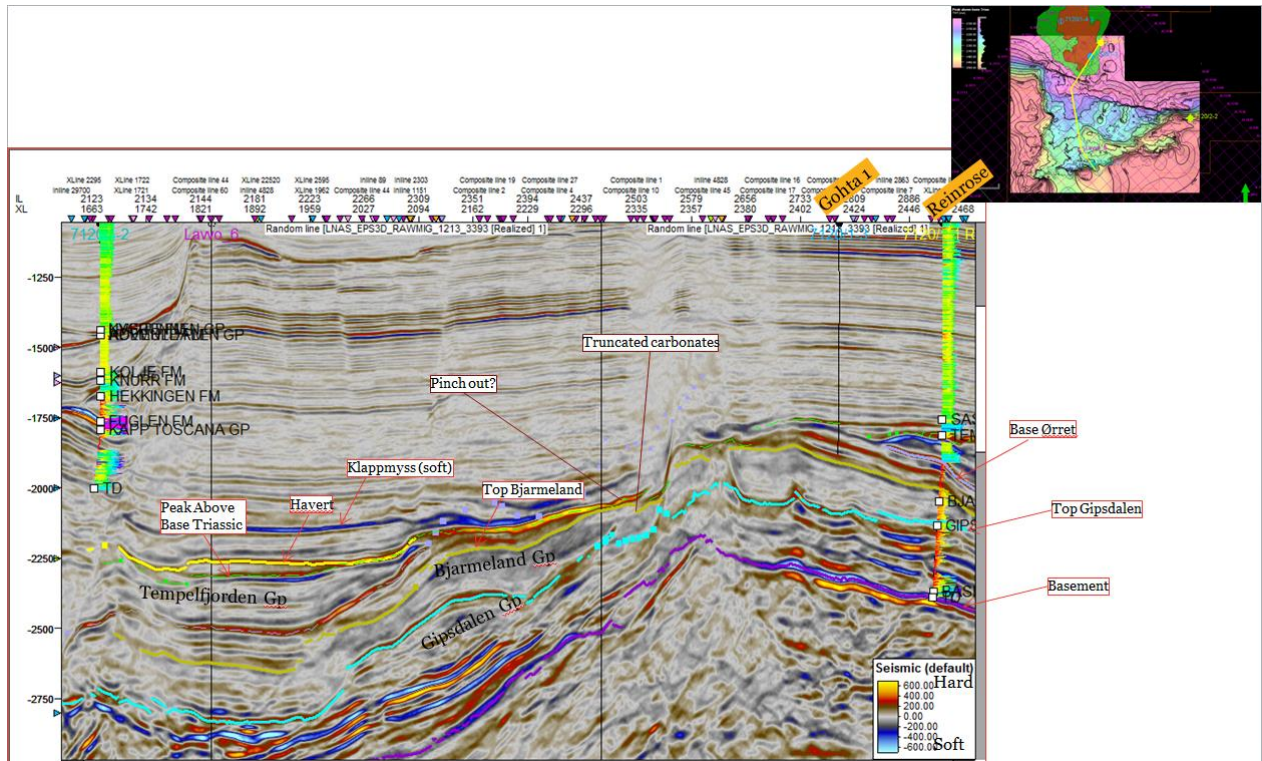


Figure 3. North south line through Myrsildre (7120/1-2), Gohta (7120/1-3) and Reinrose (71201-1).

There are still other untested plays in the license. For example the Triassic Lavvo and Komag West prospects and the cretaceous Rein prospect. Also interesting amplitude anomalies have been mapped in the shallow Tertiary Lodde lead. The Jurassic Noaide prospect is also based on amplitude anomalies.

Relinquishment

Despite of the abundance of prospects in the license, the license group decided that the mapped prospects in the license have too small chance of success and is therefore relinquishing the license as of 16/2-2017.