

**Licence relinquishment report – Production Licence 555**

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## 1. Introduction and geographic location

The evaluation of PL555 resulted in a prospect portfolio consisting of a prospect (Storm) in the Upper Jurassic strata and leads in the deeper Brent Gp, Statfjord Gp and Triassic strata. The exploration well 33/2-1, which was drilled in 2014, encountered all the former three including two units in the compartmentalized Upper Jurassic prospect. The well encountered no sandstones of reservoir quality in either of the two Upper Jurassic units, but found oil shows in the Statfjord Fm unit below. The Brent Gp consisted of only shale and had no reservoir potential. With a high risk on reservoir presence/quality on the remaining units, none of these has been upgraded to drillable prospects. The decision to relinquish the license was made by the partnership the 24th of November 2015.

P 555 comprise 193.299 km<sup>2</sup> of blocks 33/2 and 33/3. The blocks are situated in the northern North Sea on the southern side of the Manet High (Fig. 1).

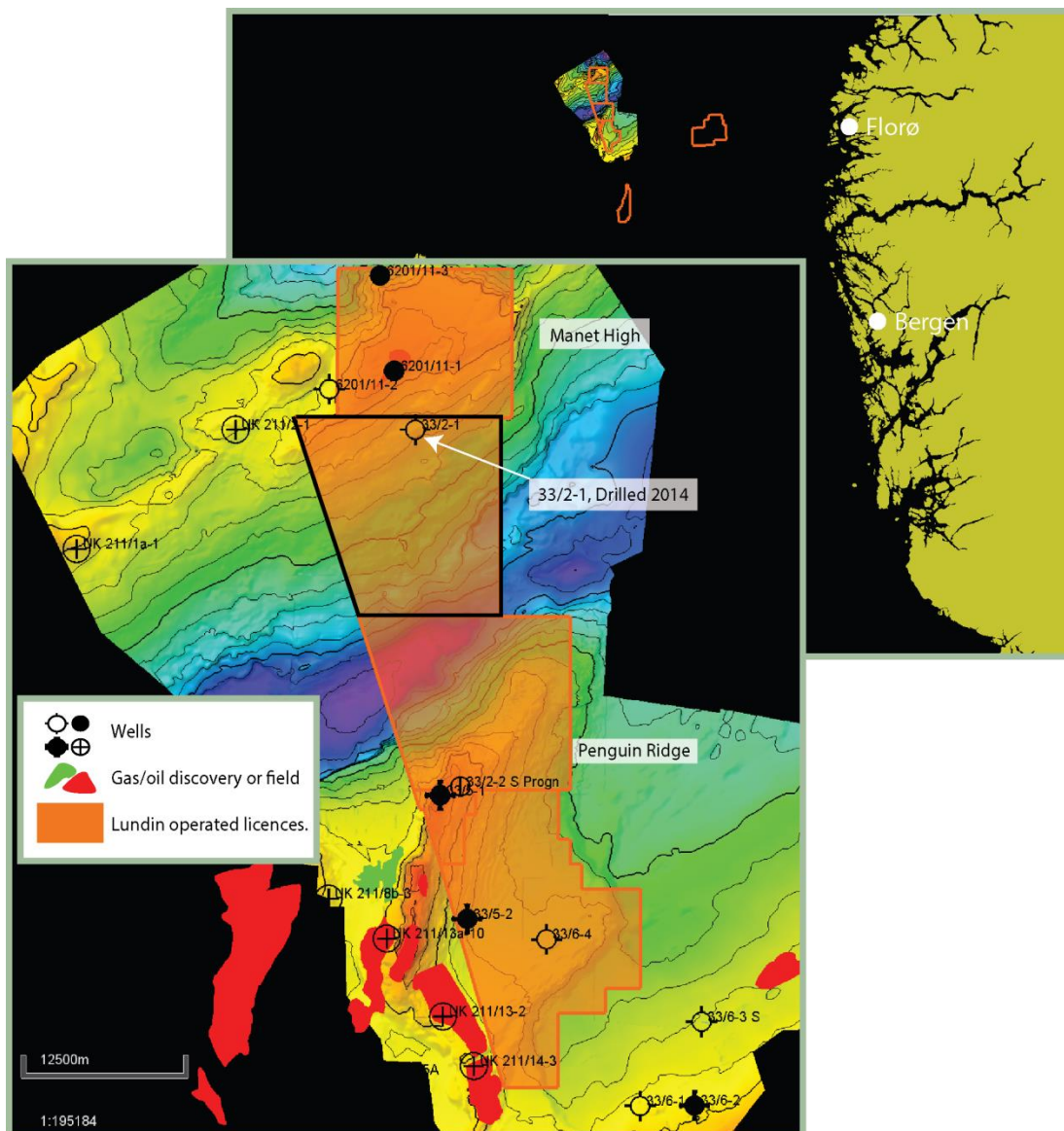


Figure 1: Location of PL 555 south of the Manet High in the northern North Sea on top of a Base Cretaceous Unconformity map.

## 2. License award and period extension

PL555 was awarded as part of APA on February 19<sup>th</sup>, 2010 with a 6 years initial license period to Lundin Norway AS (60% and operator) and Bayerngas Norge AS (40%). The APA 2009 application contained two upper Jurassic leads; the Storm Lead and the Storm Deep Lead (Fig. 2). The decision to drill one exploration well was made in February 2012. Bayerngas Norge AS transferred 10% of their interest in the licence to Forties Petroleum AS, valid from 31.10.2014.

The initial period was extended one additional year to February 19, 2017.

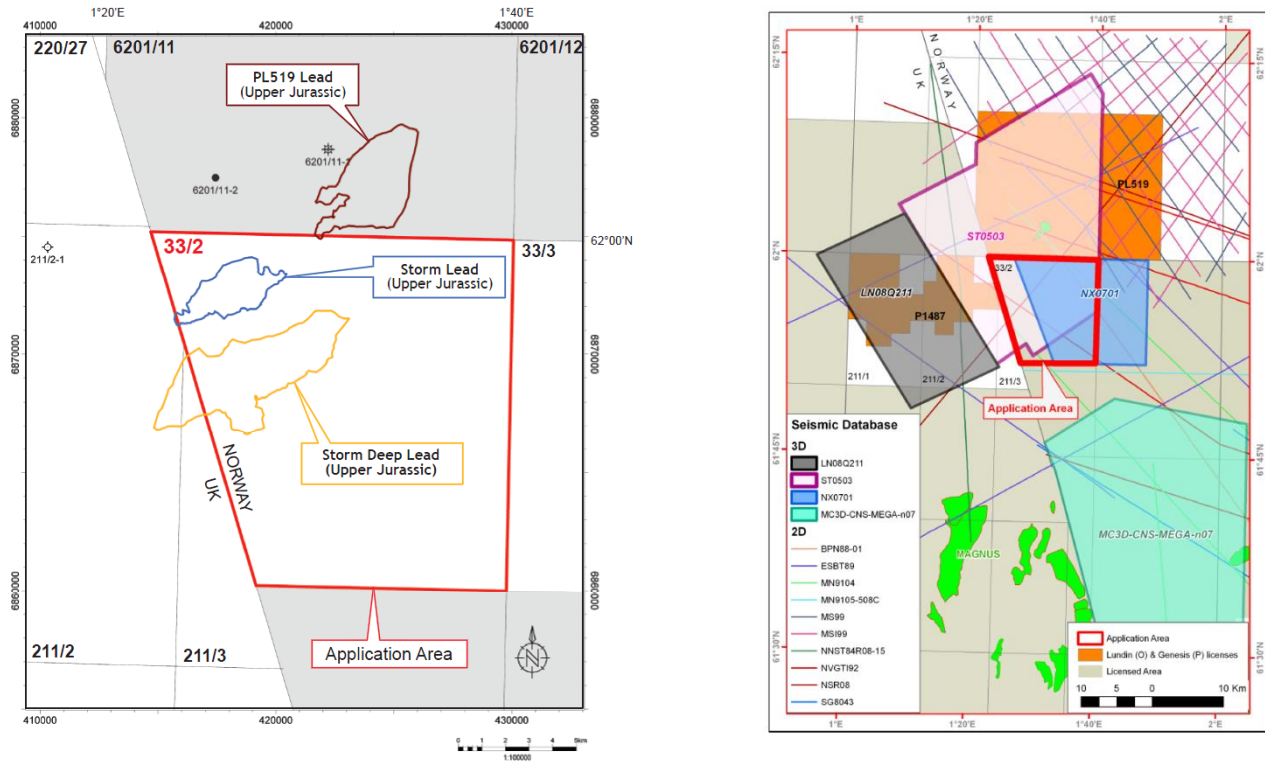


Figure 2: The lead inventory map (left) and a seismic database map (right) from the 2009 APA application.

Licencee valid from date	Licencee valid to date	Company	Interest (%)
31.10.2014	19.02.2016	Lundin Norway AS	60
		Bayerngas Norge AS	30
		Forties Petroleum Norway AS	10
19.02.2010	31.10.2014	Lundin Norway AS	60
		Bayerngas Norge AS	40

Figure 3: Historical overview of PL 555 licensees.

### **3. Completed work and special studies**

The work commitment was to perform a 3D pre-stack depth migration and carry out relevant geological and geophysical studies. A drill-or-drop decision was to be made within 2 years of award. The work program was completed and in addition to the work commitment special studies have been performed, including:

- Upper Jurassic provenance study
- Petrography/reservoir
- Geochemistry
- Seismic frequency blending
- Post stack processing

### **4. Pre-drill prospectivity evaluation**

The seismic interpretation (both regionally and locally), geochemical analysis and evaluation of prospectivity was carried out mainly during 2010-2011. The main targets consisted of a progradational shelf complex to deep marine turbidites in the Upper Jurassic Magnus and Munin Fms.

The prospects Storm and Storm Deep were defined as structural-stratigraphic combination traps. An Eocene lead was defined in the overburden above the Storm prospect (Mary, amplitude anomaly with a stratigraphic trap). The Upper Jurassic organic rich Draupne Fm. was the primary source rock, with oil mature kitchens towards the south in the Magnus Basin delivering hydrocarbon charge to up-dip traps in the Jurassic and Eocene formations. The main risk was concerning the base seal, which had probability of 40%.

The Storm prospect appeared very most promising, with a possibility of having a reservoir set to 56 % and P50 pre-drill volume estimates of around 43,4 MSm<sup>3</sup> of oil initially in place. The Mary lead was more uncertain with pre-drill volume estimates of around 99 MSm<sup>3</sup> of oil initially in place, although most of this would be outside the licence.

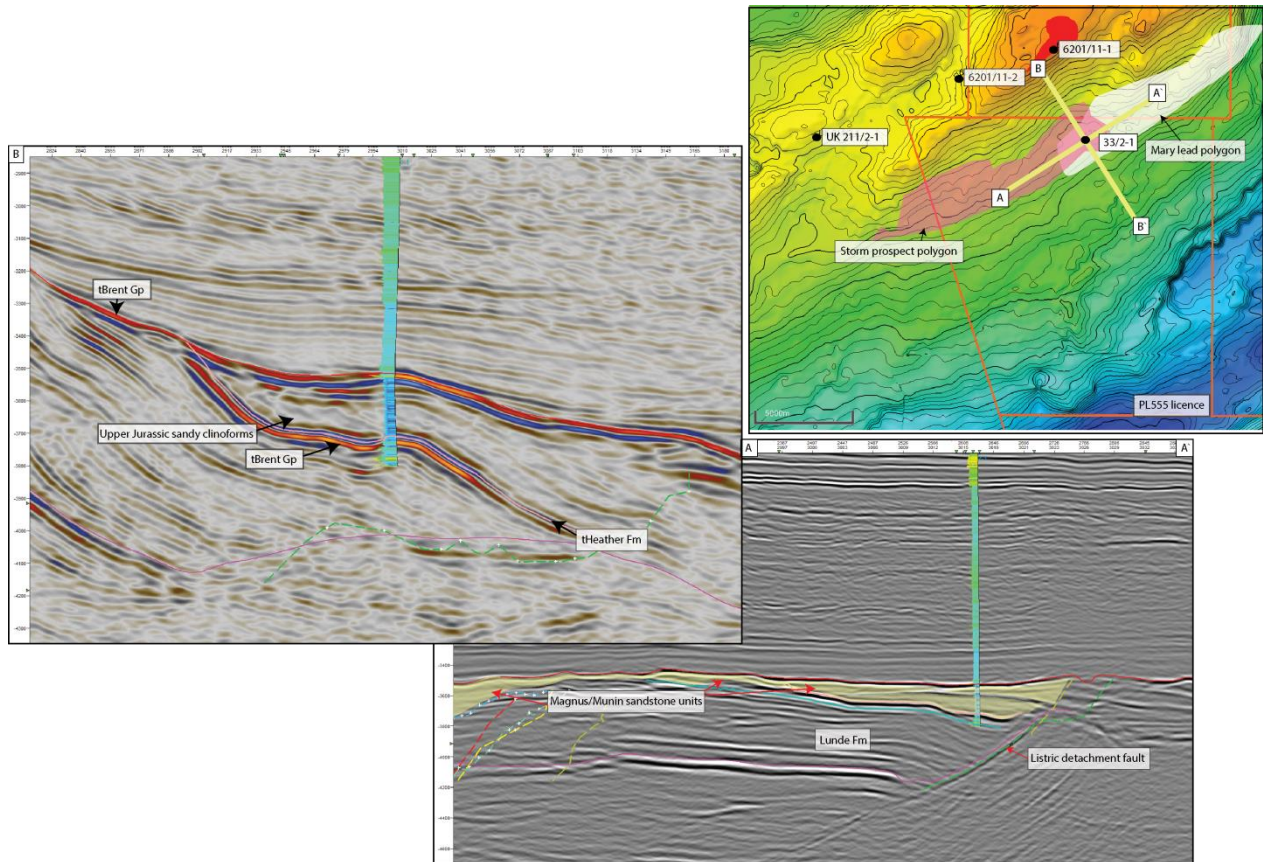


Figure 4: Seismic sections through the 33/2-1 well location showing the main pre-drill interpretations. The well was expected to hit upper Jurassic sandy clinoforms dipping in a SE wards direction. A secondary objective was in the Brent Gp deeper down the section. None of these intervals proved to contain sandstone. The part of the Brent delta that reached this far, was only the pro-delta muds. Oil shows were encountered however, below the Brent Gp in the Statfjord Gp.

## 5. 33/2-1 results

The well was drilled in the following location:

- Coordinates: **X:** 423778.61 m East, **Y:** 6874291.61 m North
- **Lat:** 61° 59' 30.658" N, **Long:** 01° 32' 42.494" E
- **UTM:** (ED 50 Zone 31, CM 3° E)
- **Lines (ST0503):** Xline: 2010 Inline: 2627

The primary well objective was to test the reservoir and hydrocarbon potential of what was believed to be a stratigraphic trap with reservoir of upper Jurassic sandstone equivalent to the Magnus Fm. The secondary well objective was to test the reservoir and hydrocarbon potential of an overlying Eocene age Mary Lead formation expected in the 17 ½" section.

Neither primary nor secondary reservoir objectives were met. However, hydrocarbons were encountered in Cretaceous and Jurassic reservoir sequences but not in commercial quantities.

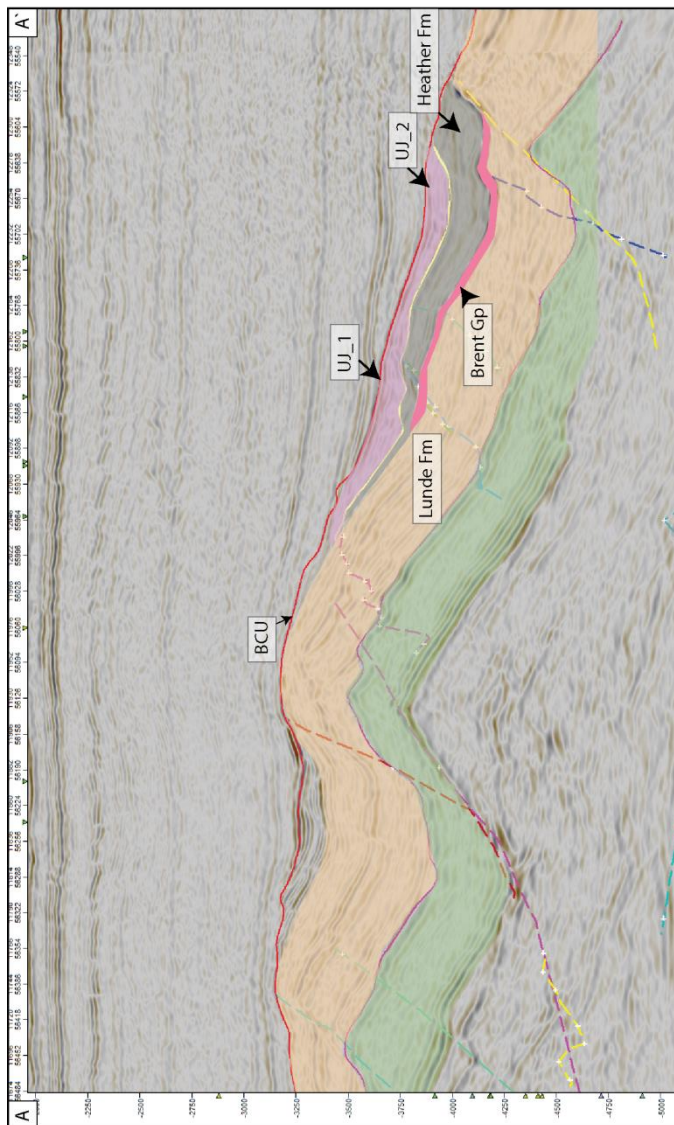
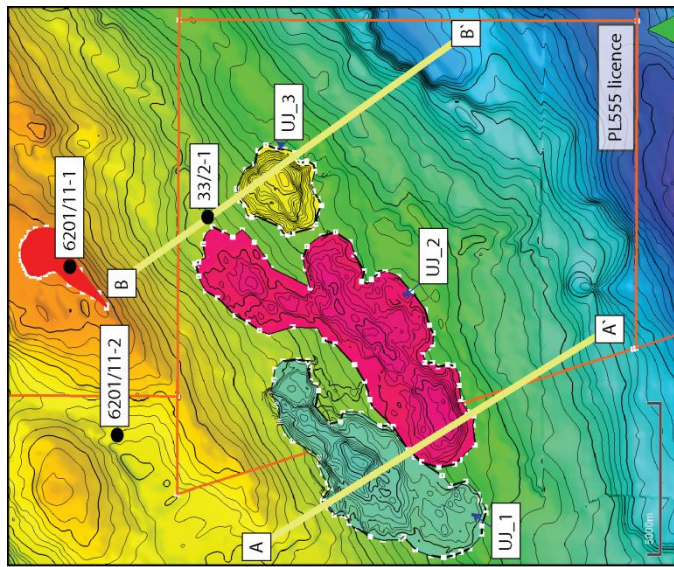


Figure 5: Seismic section through Upper Jurassic leads 1 and 2 (UJ\_1 and UJ\_2).

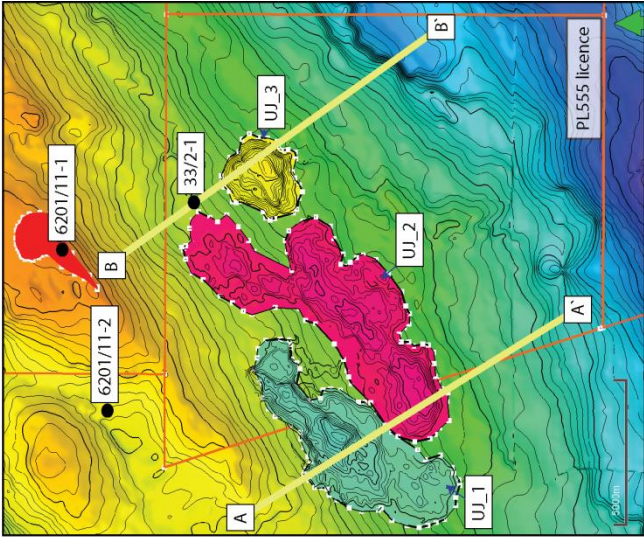
The overall results of the well were very disappointing. No hydrocarbons were encountered in primary target and there were no reservoir-rock in the Upper Jurassic section. Sandstone-rich clinofolds turned out to be either consisting of Heather Fm mudstone or simply a result of seismic processing. There is however a hiatus between the top Heather Fm and the BCU, which indicated that there could be younger Jurassic sediments in the region.

No sandstones were encountered in the Brent Gp either as the pinch-out line of the Brent delta clearly goes further south. Gamma ray logs shows that the Brent system still has progradational tendencies, but the sand-transporting processes just haven't reached this far.

The well was spudded the 07.10.2014, reached well TD at 4459 m MD / 4457 m TVD and was completed the 28.12.2016 before the rig was handed over to Wintershall in transit to the Imsa well location at 500 m from the 33/2-1 Storm well location.

## 6. Post-drill prospectivity evaluation

There are still prospects/leads in PL555, but due to the very disappointing results of the 33/2-1 well the risk of hitting a non-reservoir or a poor reservoir has significantly increased. There are still units within the Upper Jurassic strata overlaying erosional surfaces in the area surrounding the well, which contain strata younger than the Heather Fm strata (see polygons UJ\_1, 2 and 3 in Figures 5 and 6) and potentially could contain Magnus/Munin sandstones. These untested units were also part of the pre-well Storm prospect. Two of them (UJ\_1 and 2) partly goes into the English sector.



#### 47. Summary

PL555 initially contained 2 leads (Storm and Storm Deep) of which the former was drilled in the 33/2-1 well in 2014. The well proved no reservoir within the lead and was characterized as dry, although it has oil shows in the deeper Statfjord Fm. Other stratigraphic units within the Storm lead are still untested and could contain sand, but due to the high risk on reservoir presence/quality on these, none of them have been upgraded to drillable prospects.

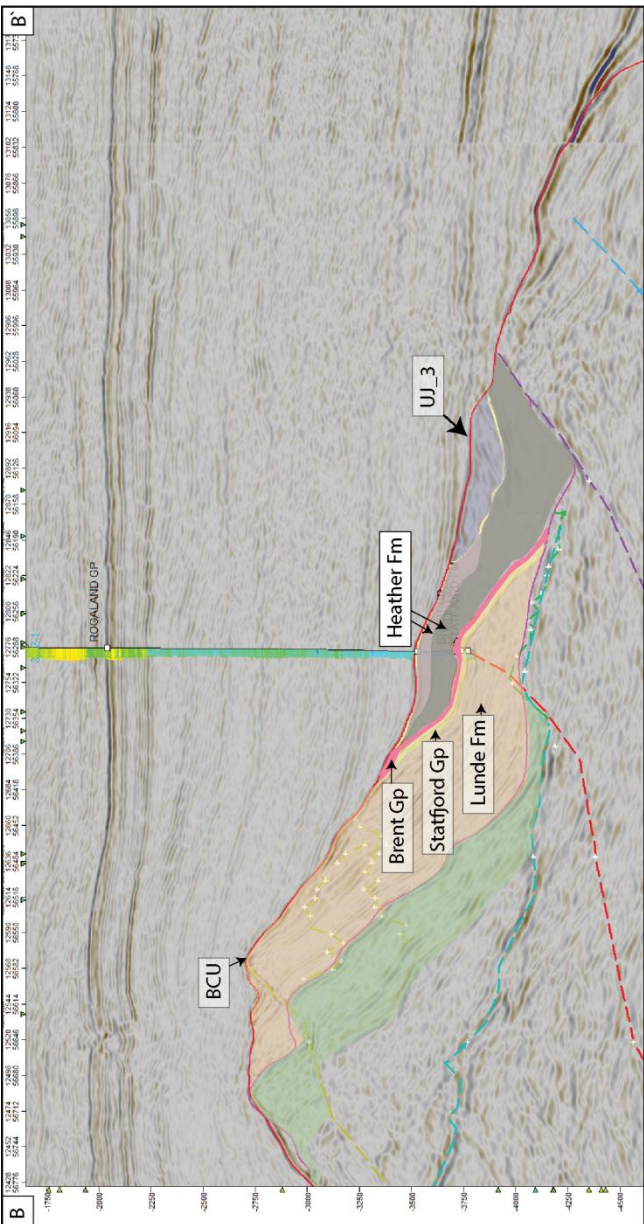


Figure 6: Seismic section through Upper Jurassic lead 3 (UJ\_3).