

PL 584 Relinquishment Report

May 2015

Contents

1. Summary and Conclusion	3
2. Introduction	3
3. License award	4
4. Completed work program and special studies	5
5. Pre-drill prospectivity evaluation	6
6. 6405/12-1 well results	9
7. Post drill prospectivity evaluation	12

1. Summary and Conclusion

The evaluation of PL 584 resulted in a prospect portfolio consisting of three four-way dip closures with Paleocene objectives. The exploration well 6405/12-1 tested the largest of them; the Lindarormen prospect. The well was dry. The two remaining prospects have a limited volume potential and very high risk on reservoir presence and oil charge. The decision to relinquish the license was made by the partnership on the 29th of April 2015.

2. Introduction

PL 584 comprises 972 km² of blocks 6305/3, 6306/1, 6405/9 & 12, 6406/7 & 10. The license is located in the Rås Basin, some 80 km north-northeast of the Ormen Lange Field (Fig. 1).

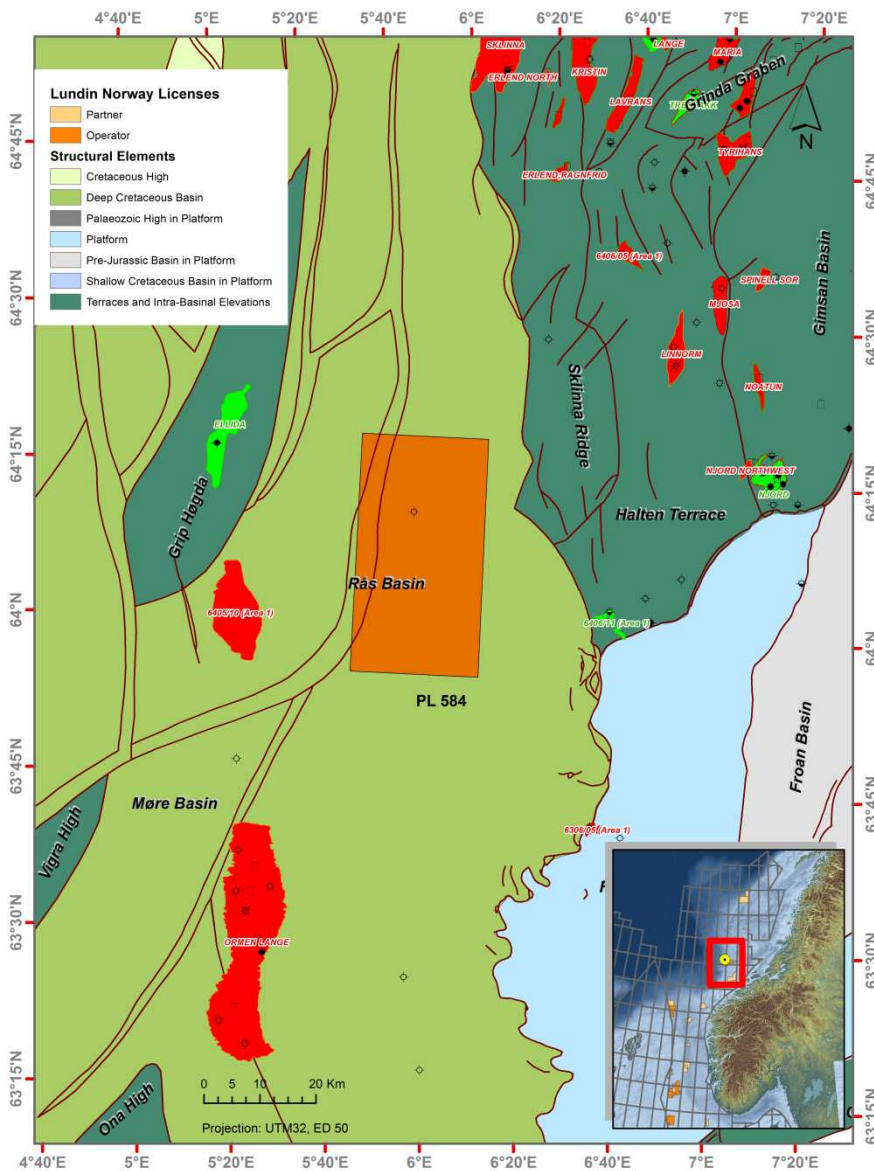


Figure 1: PL 584 location and main structural elements

3. License award

PL584 was awarded as part of APA 2010 on 4th February 2011, with a 8 years initial license period to Lundin (60% and operator) and Bayerngas (40%).

The APA 2010 application contained a main prospect in the northern part of the license, called the Lindarormen prospect. In addition, some smaller closures were mapped in the southern part of the license, see figure 2.

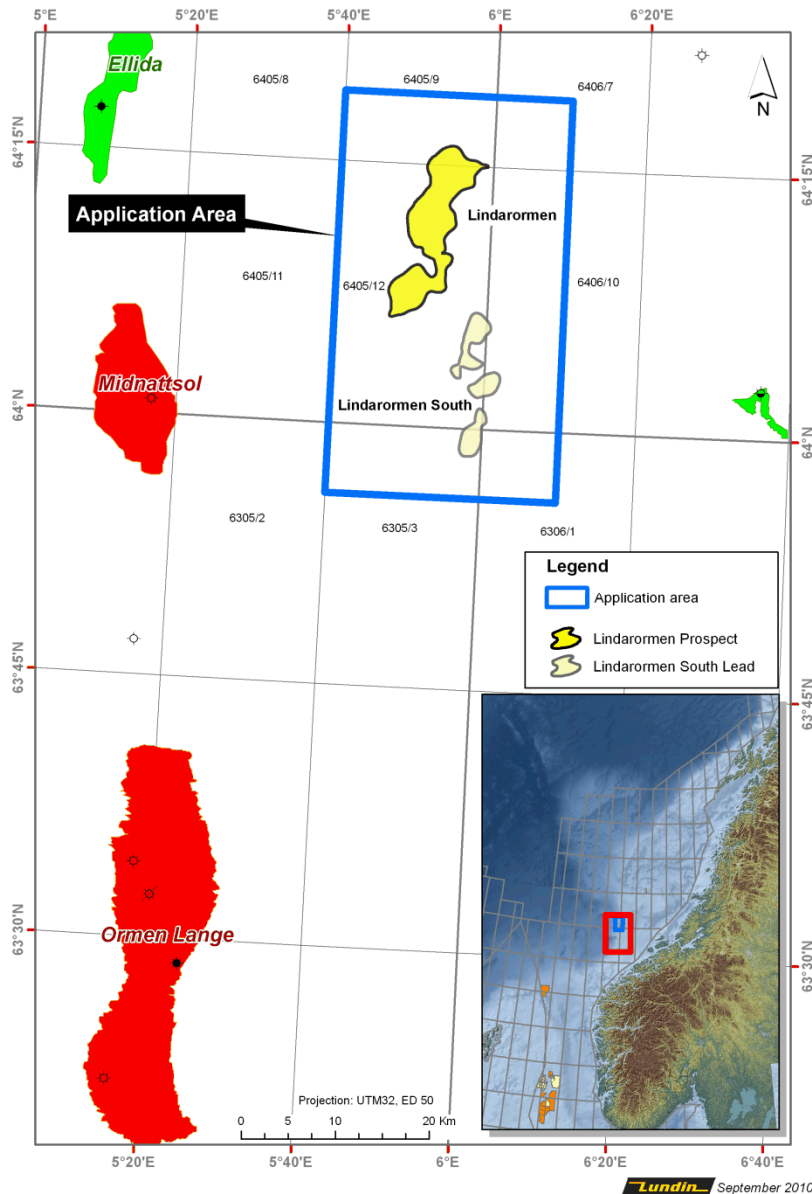


Figure 2: Prospectivity portfolio from APA 2010

4. Completed work program and special studies

The work commitment was to acquire 3D seismic data. A drill-or-drop decision was to be made within 3 years of award.

The seismic work commitment was fulfilled during 2012 by the acquisition of a 690 km² 3D seismic survey, fig. 3.

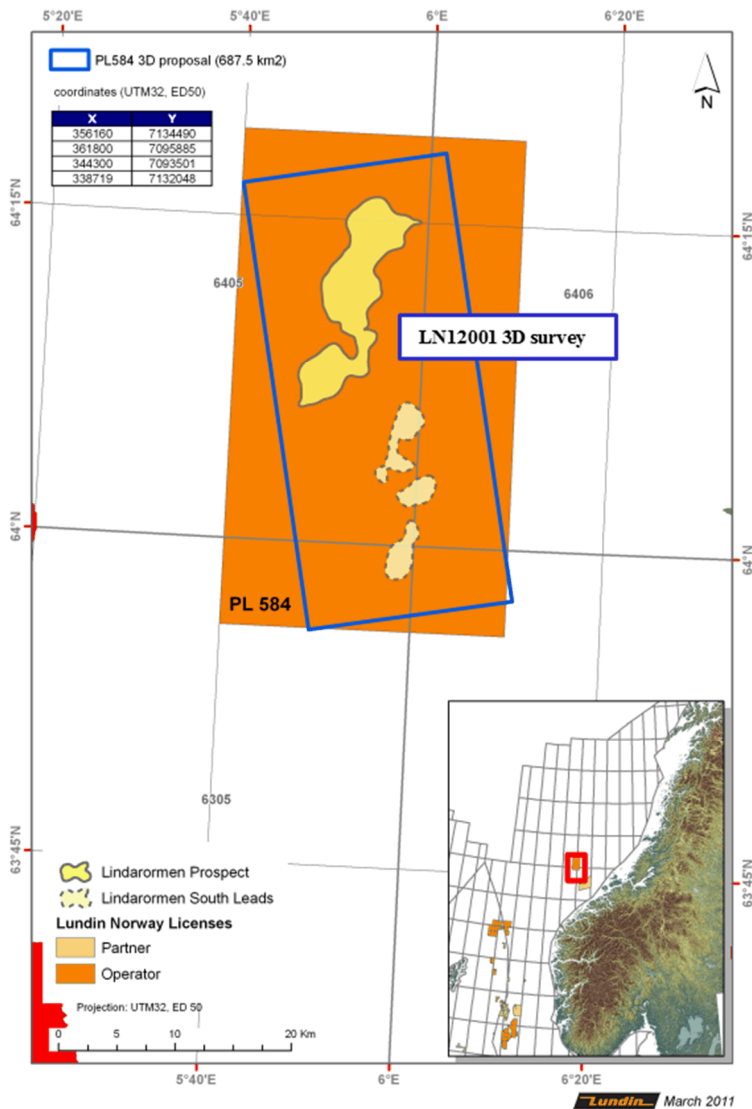


Figure 3: LN12001 3D seismic coverage

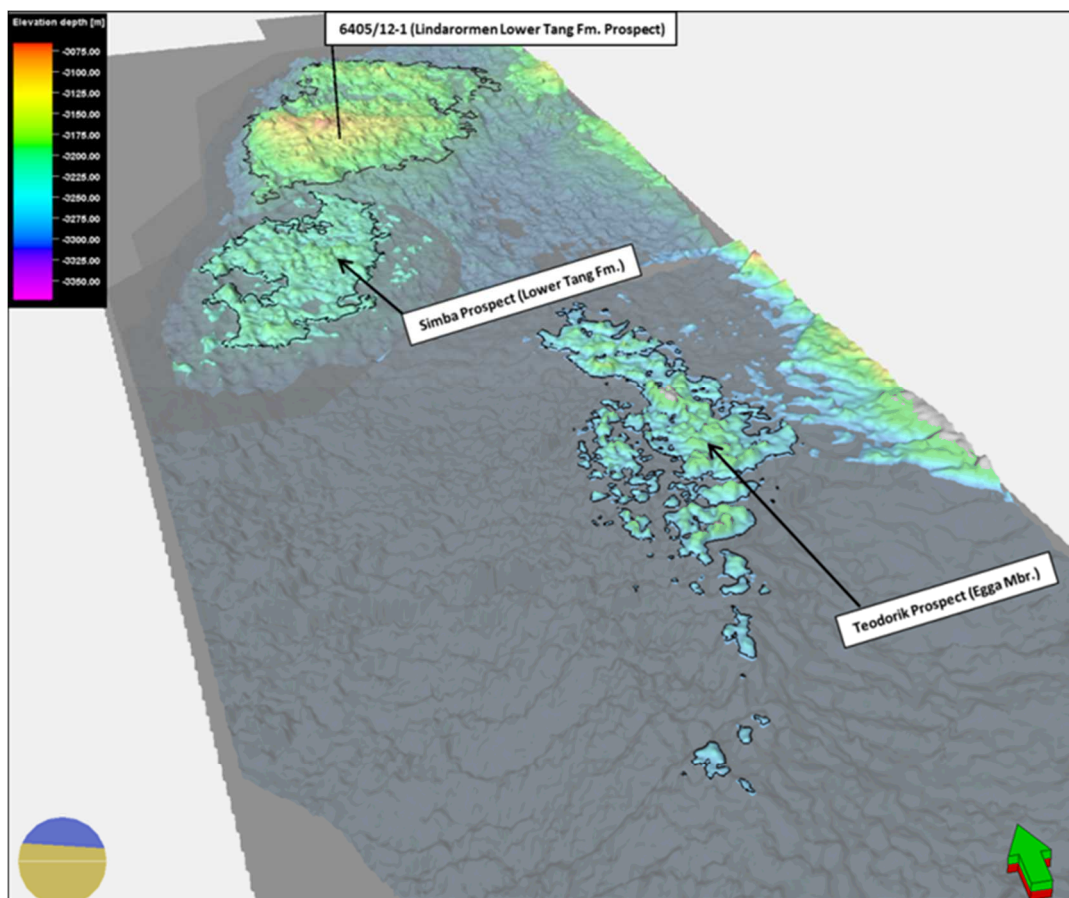
In addition to the work commitment, special studies have been performed, including:

- Reprocessing of the Broadseis 3D survey (LN12001R13). The application of a new designation and de-ghosting regime (Learnings from LN12M02 UtsiraHigh) allowed for better de-noising and demultiple. Furthermore, beam migration was applied to reduce noise and improve structural continuity.
- Basin modeling

The deadline for the drill-or-drop decision was 4th February 2011. An application for a six months extension of the deadline was filed in January and granted in February 2014. The decision to drill one exploration well was made in May 2014.

5. Pre-drill prospectivity evaluation

Three four-way dip closures were mapped within the 3D survey (Fig 4). The largest structure, called Lindarormen, comprised a closure of some 50 km² with a vertical relief of 75 m. The prognosed apex was 3060 m MSL. Simba and Teodorik were two smaller closures further south.



Structure	Prospective resources [*10 ⁶ m ³] oil (P90 – P50 P10)
Lindarormen	17.6 – 30.7 – 49.1
Simba	2.2 – 4.5 – 7.5
Teodorik	3 – 6.4 – 11

Figure 4: Lindarormen, Simba and Teodorik prospects

The main target was sands in the Paleocene succession analogous to those seen in the Ormen Lange Field, but with a different source direction into the Rås Basin. Thickness maps and seismic interpretation suggested a feeder canyon system through the Frøya High. The sands were assumed to be sourced from the east towards the west, via the Rås Sub-basin and were thought to be deposited as slope to basin floor turbidites in

the location of the Lindarormen prospect. The trap comprised a four-way dip closure that was sensitive to depth conversion.

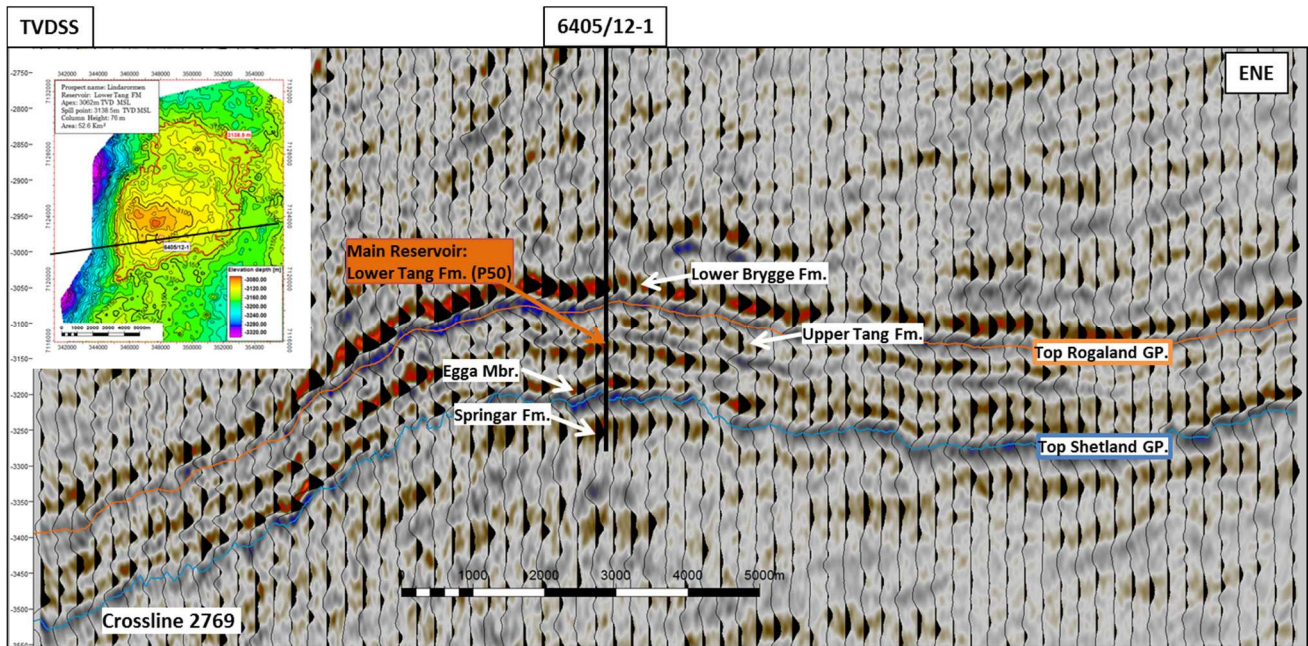


Figure 5: Seismic cross section through the Lindarormen prospect. The line location is shown in figure 6.

The cap rocks for the Lindarormen prospect were assumed to comprise the siltstones and shales of the Våle Formation Equivalent to shales of the Tang/Lista Formation; these are proven effective in the nearby Ormen Lange field.

Basin modelling indicated that a potential Upper Cretaceous source rock in the Rås Sub-basin could give oil, as found both in the Ellida discovery and in the southern part of the Ormen Lange field. Hence, predrill scenarios envisaged pure oil or oil-leg with gas-cap outcomes.

The well location was chosen on the southern flank of the prospect to test both the main target Lower Tang Formation and the underlying Egga/ Springar sequences in an inferred distal position.

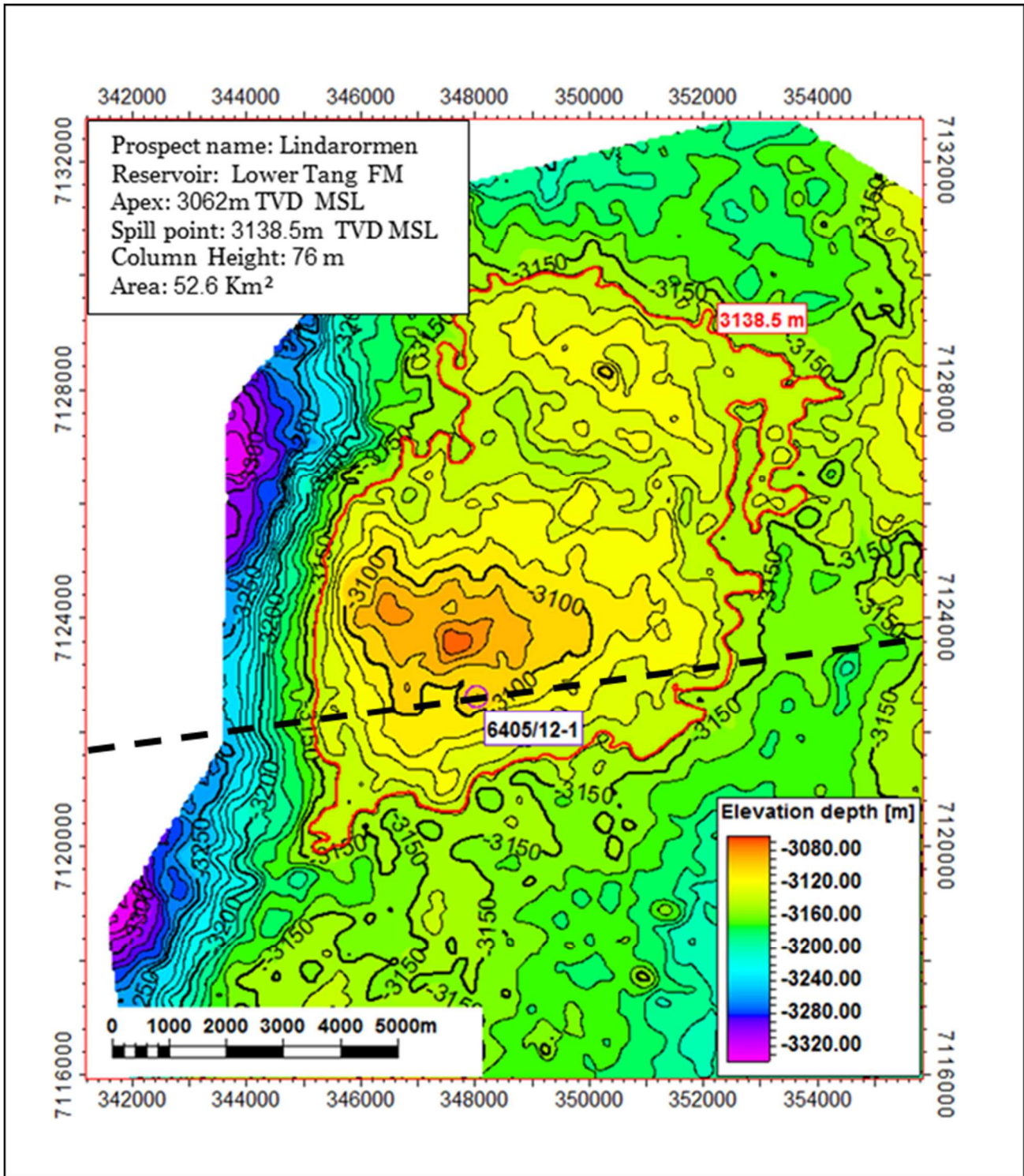


Figure 6. Well 6405/12-1 location on the Lower Tang Formation depth map.

6. 6405/12-1 well results

The well was drilled as a vertical well at the following location:

X: 348021,63 m E	Y: 7122663,18 m N	UTM Zone 32N
Lat: 64°11'42.158"N	Long: 5°52'12.700"E	ED-50
Line intersection: (LN 12001)	Crossline 2767	Inline 1316

The well was spudded on the 30.10.2014 and reached a TD of 3330.0 m RKB in late Cretaceous Nise Fm. The well was plugged and abandoned on the 16.01.2015.

The well was dry. No reservoir quality was found in the Paleocene succession.

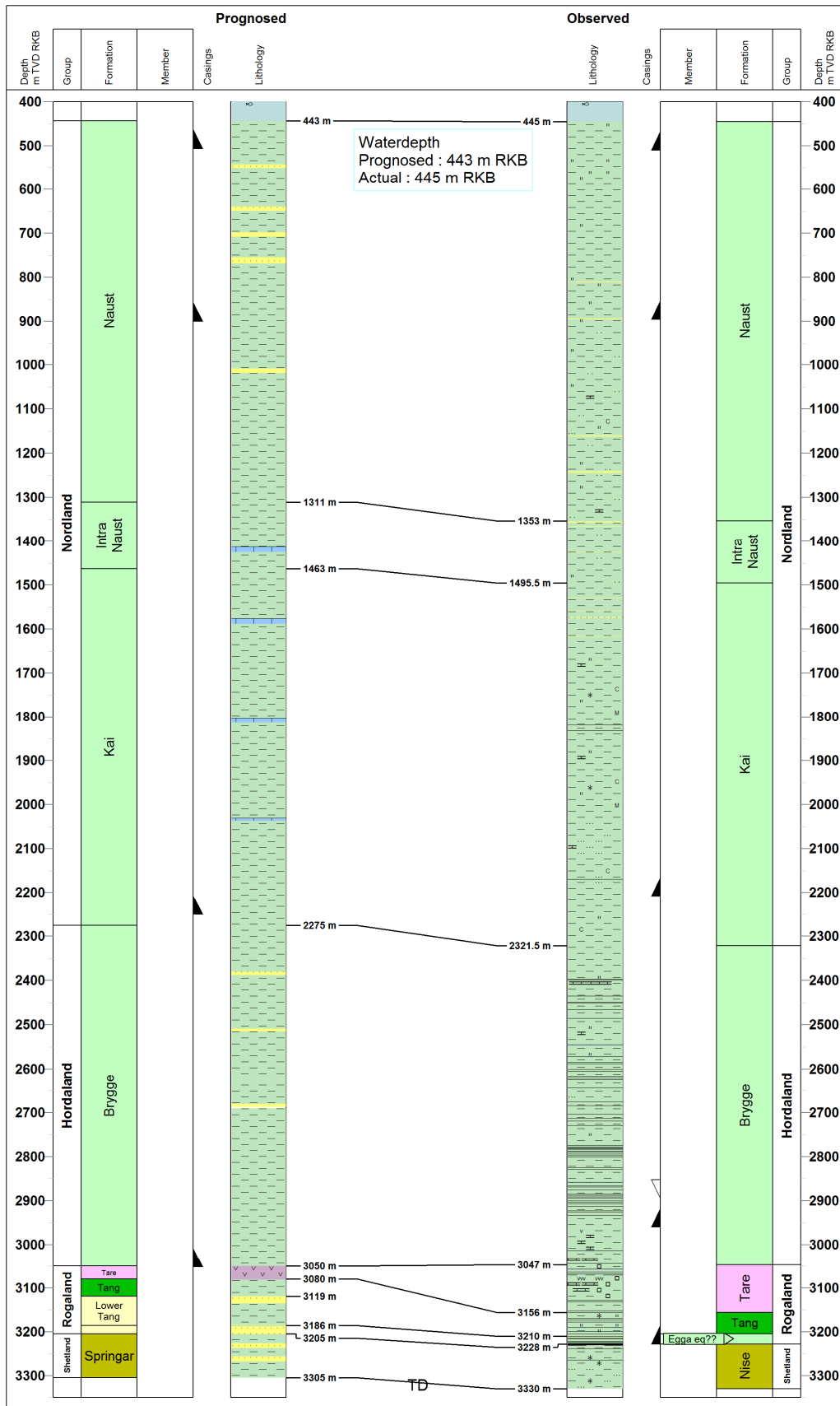
The prognosed versus actual lithology is shown in figure 7.

The main target; the Lower Tang Fm, was represented by a unit of claystones with minor limestone stringers and lack of reservoir is considered the main cause of failure for the prospect. In addition, the Egga Sandstone was not developed; the well encountered an 18 m thick unit of claystones and limestone stingers at that level.

No Springar Formation was found; the well drilled straight into Nise Formation at 3228 m RKB. A gas kick was observed in claystones at 3230 m RKB. Between 3245 m to TD at 3330 m RKB a silty claystone with high glauconite content was encountered. An increase in the gas level was observed in this interval. The log interpretation (Figure 8) indicates moderate porosity. Although gas was recorded while drilling, the resistivity was relatively low, indicating high water content. The high water content may be explained by water being bound by glauconite in the formation. Five formation pressure points were attempted with Testrak in the interval from 3230 – 3296 m RKB, but no valid pressure measurements were obtained due to lost seal, indicating poor reservoir quality.

Geochemical analysis of headspace gas samples indicated the occurrence of thermogenic gas in the target interval. Gas compositions and isotopy support a late-oil to gas condensate maturity of the fluids, indicating also provenance from a terrestrially influenced source rock. The maturity of the sampled headspace gas was similar to that of the Midnattsol discovery, albeit of a wetter composition.

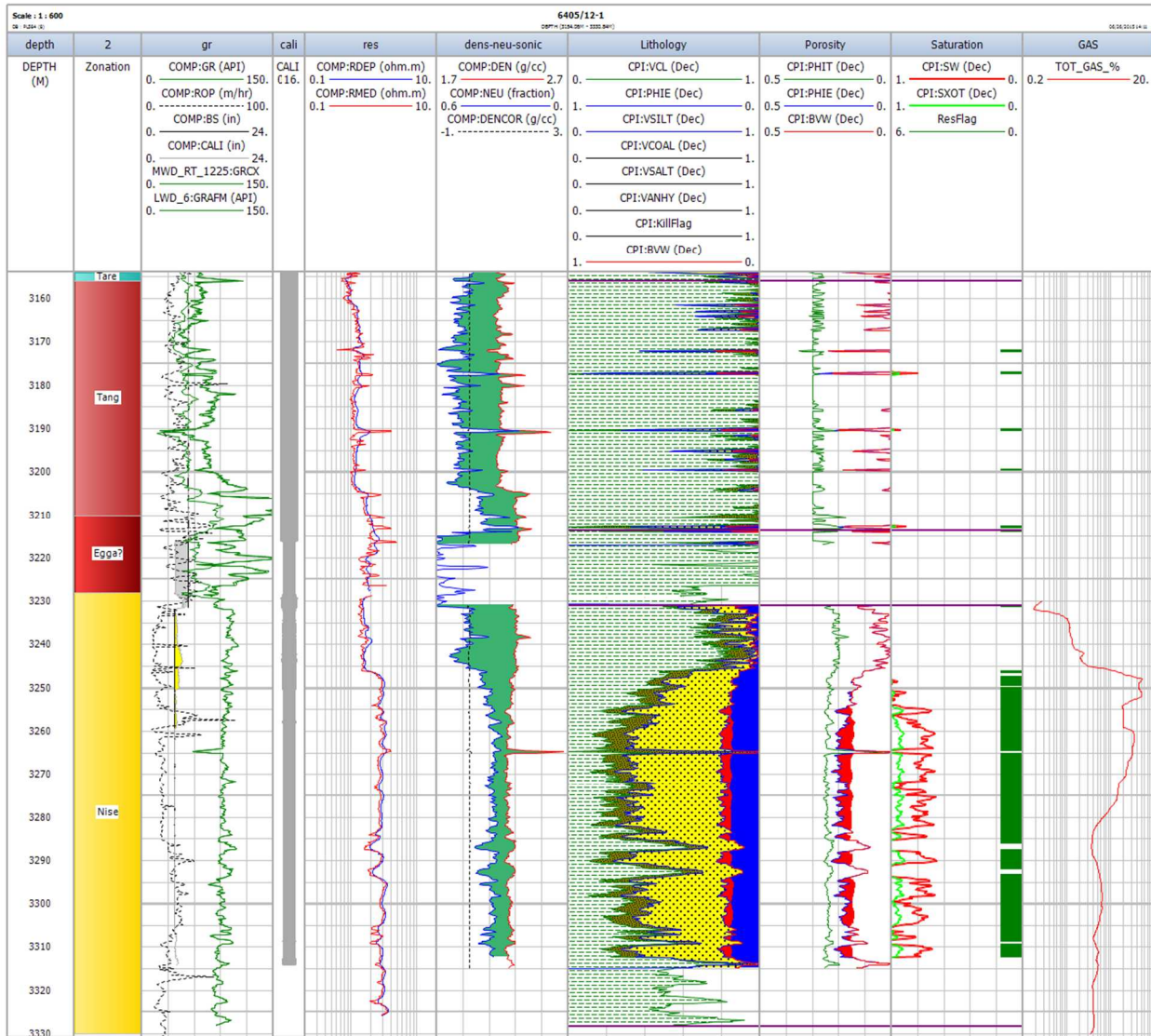
Extraction of drill cuttings in the target interval provided no indications of mature, thermogenic liquid petroleum. Geochemical signals observed were either related to indigenous organic matter or drilling mud contamination.



Well: 6405/12-1

Gravitas template v2.05 [20110802] - A.J.C. Document date 25.06.2015

Figure 7: Well 6405/12-1 prognoses vs actual



Zone Name	Top	Bottom	Gross	Net	N/G	Av Phi	Av Sw	Av Vcl
Tang	3156	3210	54	1.52	0.028	0.203	0.942	0.242
Egga?	3210	3228	18	0.61	0.034	0.161	0.965	0.134
Nise	3228	3330	102	61.26	0.601	0.181	0.822	0.269

Cutoffs used: $\Phi_i \geq 0.12$, $S_w \leq 0.5$, $V_{cl} \leq 0.65$

Figure 8: Well 6405/12-1 Computed petrophysical interpretation, 6405/12-1

7. Post drill prospectivity evaluation

The remaining prospectivity in PL 584 is interpreted to be low. The two remaining structures, the Simba and Teodorik prospects, have a small volume potential. The risk of no reservoir is very high due to the reservoir failure in the 6405/12-1 well. Consequently, the remaining prospectivity is considered uneconomical and a decision to relinquish the license has been made by the partnership.