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Licence Relinquishment Report PL 190B

Reference is made to the letter sent to MPE dated 03.02.2016, regarding the expiry of the production licence 190B.

This report outlines the key license history, database, prospects and technical evaluation of production license 190B (PL190B) and fulfills the requirement by the NPD for a license status report within 3 months of relinquishment.

1 Key licence history

Production license 190B is located in the Viking Graben in Blocks 30/7 and 30/8 (Figure 1). The license was awarded to Statoil Petroleum AS, Petoro AS, and Total E&P Norge AS on 8th February 2013 as a part of the 2012 APA round. The distribution of PL190B license shares matches the share distribution in the PL190 license:

- Statoil Petroleum AS, Operator 50 %
- Petoro AS 40 %
- Total E&P Norge AS 10 %

The PL190B partnership applied for and received a 1 year extension to the DoD decision deadline. The extension was applied for in December 2014 and granted April 2015. The justification behind this extension was to allow additional analysis of the PSDM seismic reprocessing which had arrived later than originally planned. This first attempt at PSDM imaging did not provide the uplift desired to image the top of the reservoir clearly. A study to understand the reasons behind this and investigate alternative PSDM imaging methods was recommended and required additional time to complete. A second reason behind the requested extension was the need for more time to complete mapping and evaluation of structures over the Nautilus prospect that might lead to secondary drilling targets which could improve the economic case for drilling.

During Phase 1 the Nautilus prospect was re-evaluated using the ST13M05 reprocessed 3D PSTM seismic dataset. The seismic data support a reasonably low risk related to trap geometry for the Nautilus prospect. This dataset was available in August of 2013. Additional reprocessing of ST13M05 using a PSDM migration approach was undertaken and completed in October 2014. This was followed by additional in-house testing of PSDM algorithms that was concluded March 2015.

The work program for Phase 1 to undertake relevant geological and geophysical studies has been fulfilled. The APA application in 2012 that led to the PL190B license focused primarily on the Nautilus prospect. The results of

the geological and geophysical studies indicate a high risk for reservoir presence and producability. An additional project was undertaken to rescreen the Cretaceous and Tertiary stratigraphic intervals. No new leads were identified.

In light of the high risk associated with Nautilus prospect, and that no new leads were identified, the partnership took the decision to drop as of 8th February 2016 and completely relinquish PL190B.

Work program – Phase 1

Work obligations and Decisions	Initial expiry date	Updated expiry date
Study of geology and geophysics	08.02.2015	08.02.2016
Decision to drill or relinquish	08.02.2015	08.02.2016

The following Management and Exploration committee meetings have been held in the license:

- EC meeting - 21.01.2016
- EC/MC meeting - 28.09.2015
- EC meeting - 20.05.2015
- EC meeting - 27.03.2015
- EC meeting - 13.02.2015
- EC meeting - 02.12.2014
- EC meeting - 17.10.2014
- EC meeting - 19.06.2014
- EC meeting - 06.03.2014
- EC meeting - 12.12.2013
- EC meeting - 30.08.2013
- MC meeting - 31.05.2013
- MC meeting - 23.04.2013

2 Database

The PL190B common seismic database consists of several 3D datasets (shown in Figure 1): MC3D-NVG05, NH9304, NH9802, and ST13M05 (PSTM and PSDM). ST13M05 is a merge of 3 datasets: NVG05, NH9304, and NH9802. PSTM reprocessing of these data occurred in 2012/2013 and was followed by PSDM reprocessing in 2013/2014. Following this, additional testing of PSDM algorithms resulted in two additional datasets, ST13M05Z15_BEAM and ST13M05Z15_KMIG, Beam and Kirchhoff migrations respectively. The reprocessed volumes were the basis for the re-evaluation of the Nautilus prospect.

Wells within the license database are: 30/8-1 S, 30/8-1 SR, 30/8-2, 30/8-3, 30/8-4 S, 30/10-6, 30/7-3, 30/7-7 & 30/4-1.

3 Review of geological framework

No wells have been drilled in the PL190B since the license award in 2013. The regional geological understanding since the APA 2012 application has not changed. The studies performed in Phase 1 of the work program concentrated on maturation of the Nautilus prospect. The results of the studies improved understanding of the prospects and provided support for volumetric input parameters and risk assessment.

In detail, the studies completed for PL190B were the following:

- PSTM reprocessing of 3D seismic – ST13M05
- K-PSDM reprocessing of 3D seismic – ST13M05Z15
- In-house reprocessing and comparison of Beam and Kirchhoff PSDM migrations:
  - ST13M05Z15_BEAM
  - ST13M05Z15_KMIG
- Depth conversion study based on ST13M05 PSTM reprocessed 3D seismic dataset
- Remapping of Nautilus prospect on reprocessed PSTM data
- Updated volume calculations based on new mapping and revised fluid and reservoir parameters
- Re-evaluated biostratigraphy for well 30/7-7 with new results
- Petrophysical re-evaluation of wells 30/10-6 and 30/7-7
- Gas chimney study
- 30/10-6 DST re-evaluation
- Drilling feasibility study
- Screening of Paleogene and Neogene prospectivity

4 Prospect update

Nautilus prospect:

The Nautilus prospect is situated in the Viking Graben and consists of a Middle Jurassic sandstone reservoir that was post-depositionally faulted and tilted (Figures 2 & 3). The prospect lies completely within Block 30/8. The reservoir interval is the Brent Group, specifically the Tarbert Formation. The rotated fault block is expected to form a four-way structural closure. The seal is provided by Heather and Draupne siltstones and shales.

The Nautilus structure covers parts of PL190 (47%) and PL190B (53%) given a mean contact of 4748 m TVDMSL.

The Middle Jurassic play has been proven in the local area by the two wells drilled into the Brent Group, wells 30/10-6 and 30/7-7 (Figure 1). Well 30/10-6 found a 466 m Tarbert Formation package, hydrocarbons were identified and proven by drill stem testing (DST). The well was evaluated as a non-commercial discovery and given the NPDID for discovery 44366. A fluid sample was taken from a DST in the well. This indicated a GDT of 4720 m defined by the deepest extent of the DST. Fluid samples of dry gas were found proving the structure can hold hydrocarbons.

Well 30/7-7 found a 75 m reservoir package originally interpreted to be Cook Formation. Updated biostratigraphy has proven the reservoir interval to be part of the Brent Group. The reservoir is interpreted as Tarbert Formation. Petrophysical interpretation of 30/7-7 identified a hydrocarbon bearing zone between 4723 m and 4886 m, and gas bubbles were extracted during production testing. Both wells found tight formations within the Tarbert Formation with DST's demonstrating <0.1 mD permeability in all tests.

Reprocessing of 3D seismic dataset ST13M05, reinterpretation and updated depth conversion of the Nautilus prospect led to a revision of the in-place volume estimates during the license period. The updates in resource estimates for Nautilus are summarized in Table 1. The mean estimate of in-place resources decreased approximately 11% from 38.5 MSm3 o.e. to 34.2 2 MSm3 o.e. This has a minor impact on the total economic evaluation of the prospect.

A drilling feasibility study was performed for a Nautilus well. A section through the proposed drilling location used in the feasibility study is shown in Figure 4. In this study the expected pressure and temperature was estimated at 973 bar (2,10 sg EMW) and 184°C. Wells 30/10-6 and 30/7-7 were both cemented tight due to diagenetic illite which forms at temperatures higher than 130°C. Illitization of kaolin typically affects reservoirs of the HP/HT category leading to an overall porosity and permeability reduction; microporosity is often left as the dominating type. Following this, further work undertaken during the license period focused on the petrophysical re-evaluation of wells 30/10-6 and 30/10-7 with the objective of better quantifying the reservoir risk. Unfortunately, with the available information, this resulted in a further downgrade of probable reservoir quality for Nautilus.

The main conclusion of the well feasibility study was that the Nautilus prospect was drillable with a jack-up rig using a MPD system. A number of drilling risks were identified: narrow drilling window, HPHT conditions, depth uncertainty at top reservoir and casing setting depth, few reference wells and uncertain PPFG prognosis, and weather conditions during mob/demob of the jack-up rig.

Key risks for the Nautilus prospect are the combination of reservoir presence (0,3) and producability (0,7). A re-evaluation of nearby wells resulted in an increase in these risks and no new information became available during the license period that might provide counter indications. The chance of success for the Nautilus prospect has been downgraded since the APA 2012 application and is currently estimated at 0,157 (Table 2).

Technical evaluations

New technical economical evaluations were performed during the license period. The main alternatives considered were a tie-back to the Oseberg (or Tune) field and a stand-alone development. The tie-back options have the advantage of making use of existing infrastructure but also possess inherent limitations related to capacity, long distances, and competition from other parties. The stand-alone option has the advantage of being fit for purpose but the downsides of a high CAPEX/MEV and limited scalability which would probably make the expected volume discovery case uneconomical.

5 Conclusions

The work program for Phase 1 for PL190B has been fulfilled. The results of the geological and geophysical studies and a new technical evaluation indicate a high risk related to reservoir quality. This risk, in conjunction with the challenging HPHT drilling requirements, has led the license partnership to take a drop decision for the well and to make the further decision to relinquish PL190B as of 8th February 2015.

6 FIGURES

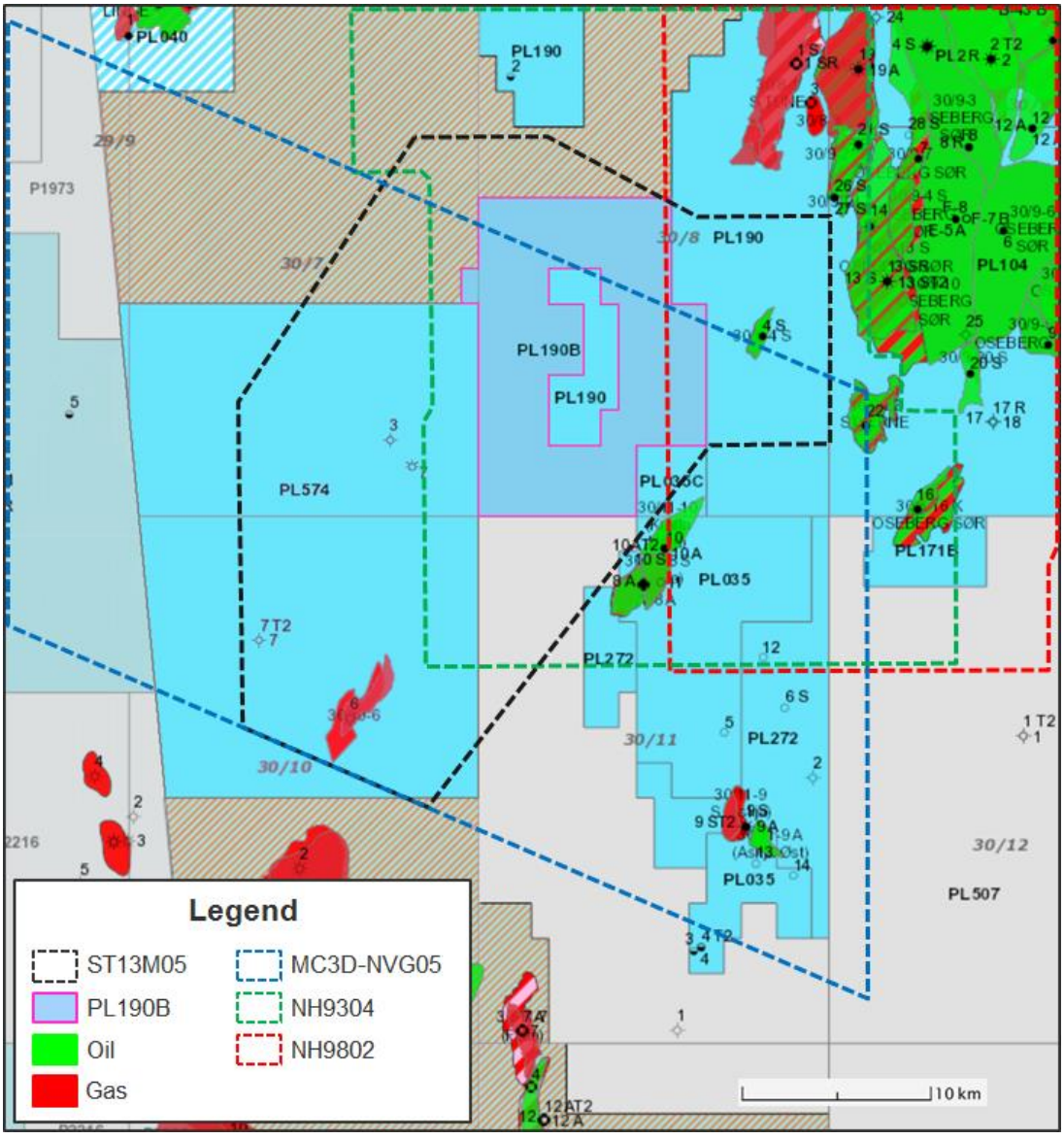

Figure 1. License overview map with discoveries, seismic surveys and PL190B area (magenta outline). Statoil operated licenses in blue.

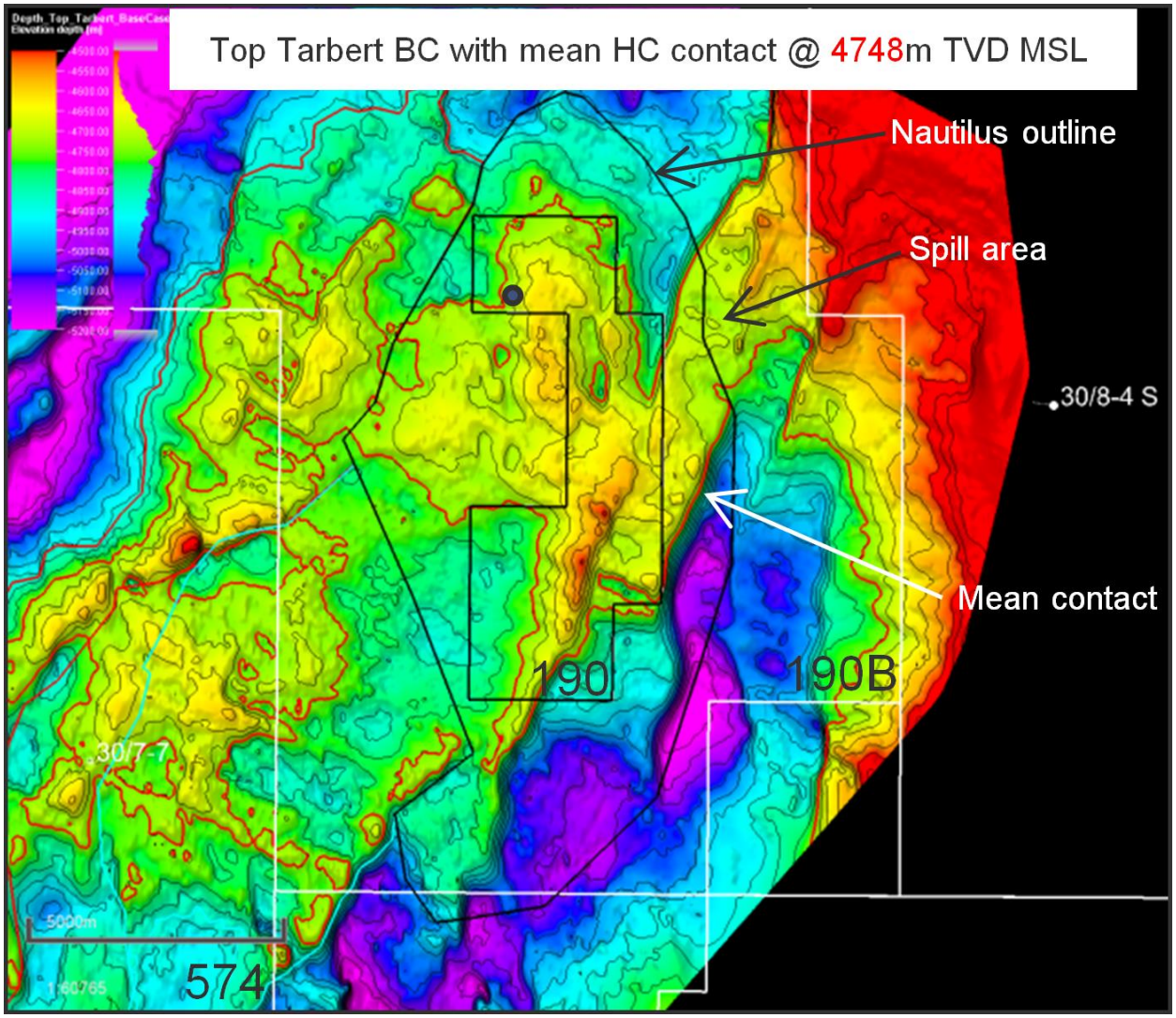

Figure 2. Depth structure map of Top Tarbert reservoir for Nautilus prospect based on reprocessed PSTM seismic survey ST13M05.

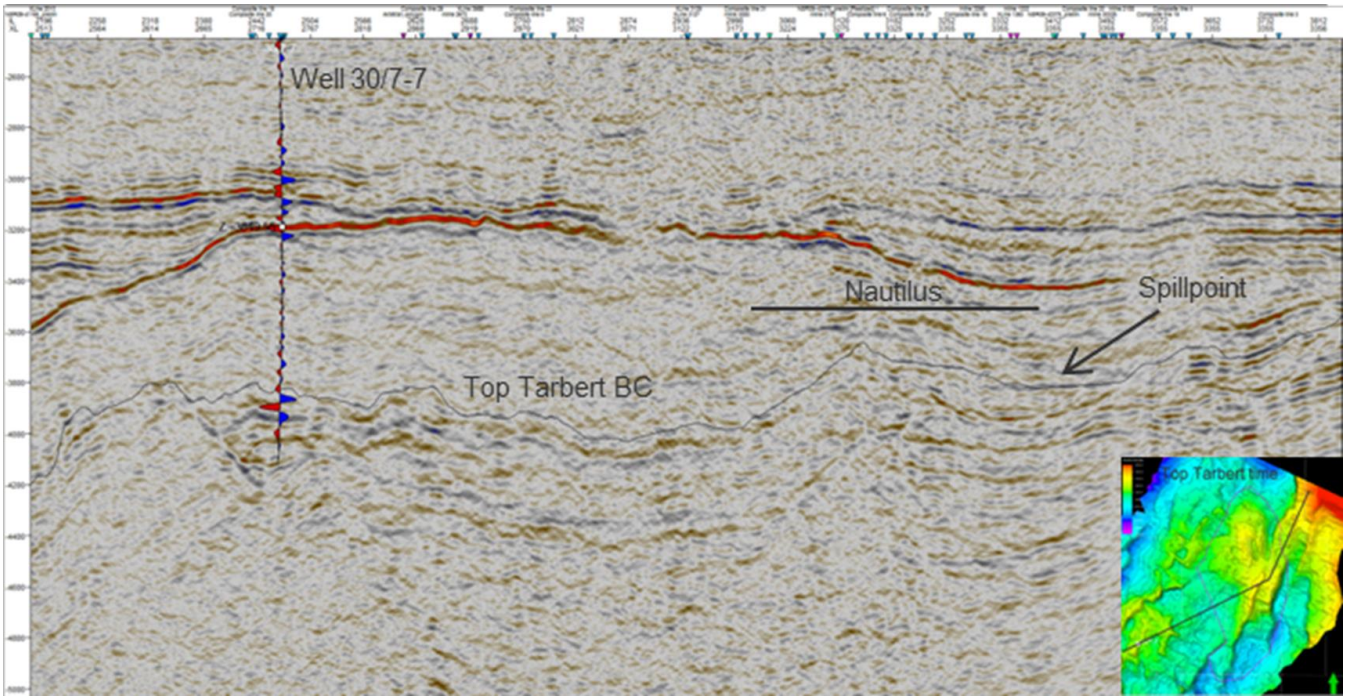

Figure 3. Nautilus prospect and tie with 30/7-7 well as seen in a random seismic (shown in inset map).

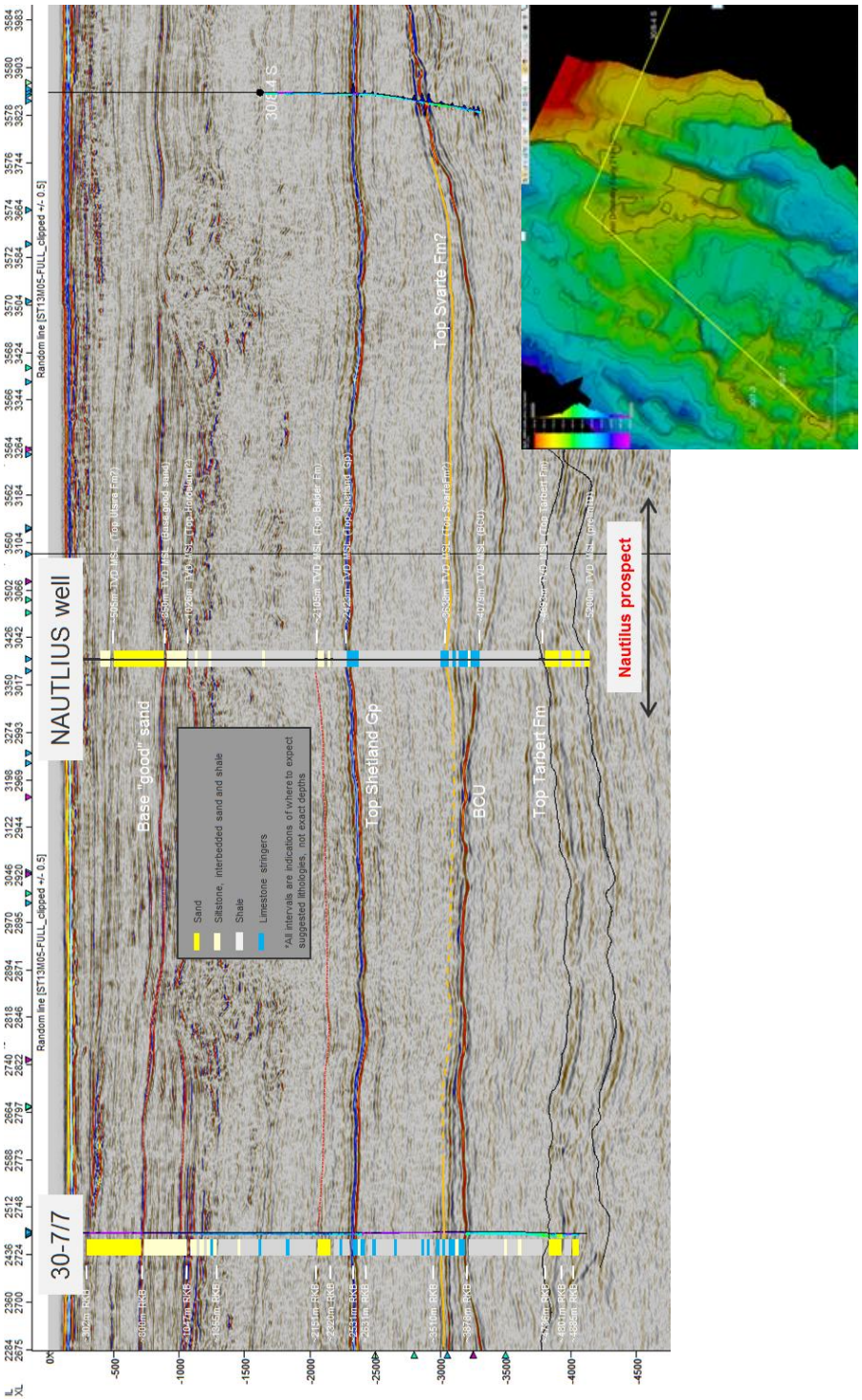

Figure 4. Prognosed Nautilus well used in well feasibility study showing tie with 30/7/7. Random line location shown on inset map view.

Prospect	Version	Unrisked in-place resources						
		Condensate 10^6Sm^3			Gas 10^9Sm^3			Total o.e. 10^6Sm^3
		P90	Mean	P10	P90	Mean	P10	Mean
Nautilus	APA 2012	1,05	5,58	11,87	6,35	32,88	69,47	38,46
Nautilus	2013	**1,61**	**9,96**	**21,6**	**8,73**	**50,3**	**105,6**	**60,3**
Nautilus	2015 Update	**0,06**	**3,07**	**9,0**	**4,73**	**31,2**	**69,4**	**34.2**

Table 1. Resources for the Nautilus prospects in the expected gas case. The information updated during the license period is shown in **bold**.

Risk elements	APA 2012	2013 update	2015 update
Trap geometry	0,72	0,8	0,8
Trap seal		0,9	**0,7**
Reservoir presence	0,27	0,4	0,4
Producability		0,7	0,7
Source Presence	1,0	1,0	1,0
Source Migration		1,0	1,0
Pg %	0,194	**0,202**	**0,157**

Table 2. Overview of Nautilus risking for APA 2012, 2013 and 2015 evaluation. Updated risk numbers are marked in **bold**.