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Bergen 17.03.2014

Licence Relinquishment Report PL 580

Reference is made to the letter sent to MPE dated 31th of January 2014 (our reference: AU-EXP NOR ELNS-00070) regarding the relinquishment of production licence 580 (PL 580).

1 INTRODUCTION

Production licence 580 was awarded on February 4th 2011 as part of the 2010 APA round. Statoil AS was the operator (60% license ownership) and shared the licence with Idemitsu Petroleum Norge AS (40% license ownership). Work obligations were to acquire 3D seismic data and perform relevant geological & geophysical studies within 3 years. The initial period for PL 580 expired on the 4th of February 2014, by which time a drill or drop decision was taken. The license partnership elected to relinquish the PL580 license.

2 BACKGROUND AND LICENCE HISTORY

PL580 covers blocks 6202/8, 6202/9 and 6203/7 (total area of 1201.773 km^2) (Figure 1). The licence is located in the southeastern part of the Møre Basin, immediately north of the Møre-Trøndelag Fault Complex, and at the mouth of the Norwegian Channel.

The main exploration targets in PL580 were shallow-gas stratigraphic-traps in the Pleistocene/Pliocene age succession. The main prospect, Bekkeblom and one lead, Iris were mapped as strong, soft seismic-amplitude anomalies on 2D seismic data during APA 2010. Biogenic gas is the most likely phase. These are located 68 km north of the Peon gas discovery (Figure 3) and approximately 110 km north of the Tampen- and Gjøa development area. The depth to the prospect is approximately 1000 m TVDMSL.

3 TECHNICAL WORK AND MEETINGS

A new seismic 3D survey (ST11009) covering parts of blocks 6202/6, 6202/9, 6202/12, 6203/4, 6202/7, and 6203/10 (Figure 1) was acquired by WesternGeco during April-June 2011 by seismic vessel WG Amundsen. This was part of the work commitment for the licence. Fast track processing was available October 2011. Pre-stack time migration migrated data was received in February 2012.

The survey covered all of Bekkeblom prospect but only parts of the Iris lead. This 3D survey, ST11009, formed the basis for the further technical evaluation of PL580.

Additional technical work carried out included:

- Processing and interpretation of new 3D seismic survey
- Geophysical work, including AVO and P-cube inversion studies
- CSEM feasibility study
- Sedimentological study
- Prospect evaluation
    - Volume calculation
    - Risk and technical economical evaluation

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

- EC/MC meeting - 29.03.11
- EC/MC meeting - 25.10.11
- EC/MC meeting - 02.07.12
- EC/MC meeting – 31.01.12

In addition the following work meeting has been arranged in the license:

- EC work meeting – 31.05.12

4 PROSPECT EVALUATION

The Bekkeblom prospect resources are split evenly between the northern part of PL580, (blocks 6202/9 and 6203/7), and open acreage (blocks 6202/6 and 6203/4) (Figure 1) which is outside the APA2010 perimeter.

Since the award of PL580, the prospect has been matured using the newly acquired 3D (ST11009) survey, geological and geophysical studies and knowledge from surrounding fields and wells (35/2-1 key well - Peon).

Bekkeblom is a seismic amplitude-driven prospect in the Plio-Pleistocene glacial succession. The trap type is stratigraphic. The hydrocarbon type is is expected to be biogenic dry-gas.

The Bekkeblom prospect decreased in size compared to the APA 2010 application (Figure 2), it became more segmented with 4 segments in the Main Bekkeblom reservoir level and 2 in the deeper level, (40-60 ms deeper)(Figure 3). The deeper anomalies are separated from the Main Bekkeblom reservoir level by a shale layer (Figure 4) and the segments of the Bekkeblom level are interpreted to be separated from each other by slumps and/or slides (see also figures 5 and 6).

The prospect trap is defined by a mud-filled slump to the east, and by dip-closure to the NW. The critical point is up-dip lateral seal towards the Peon gas discovery to the south (Figure 7). Here it is difficult to visualise a sealing mechanism and shale-out must be invoked for the trap to function. Lateral seal is a key risk for the Bekkeblom prospect. Proposed gas columns ≤ 10m for the Bekkeblom prospect will not cause any seal fracture risk as long as

the aquifer is normal pressured. However, even a minor over-pressure in the aquifer could have caused a trap-seal failure (this is one of the key-risks for the prospect).

The amplitude anomaly was confirmed on the acquired 3D survey. The AVO study that was performed showed a high probability of gas presence however gas saturation levels could not be quantified.

The Bekkeblom reservoir is deposited in a slope setting, sediments are sourced from the east (Figure 4), during a relatively narrow time window of an early phase of the glacial retreat stage. The reservoirs are interpreted to be older than in Peon gas discovery 35/2-1 (Figure 3). Therefore Peon discovery is not regarded as a direct analogue for the Bekkeblom prospect.

The AVO anomaly shutoff down-dip is generally not conformant with the depth contours, only in a very few places a possible GWC can be seen in the seismic. The combination of slumping / faulting and shaling out of sands are thought to be the main reasons that the anomaly is only locally conformant with structural contours (Figure 7).

The main reservoir is thin, defined as a strong negative seismic anomaly (decreasing acoustic impedance) consisting of one seismic cycle, except in the Bekkeblom North segments which consist of two cycles and here the overall mean reservoir for these segments is assumed to be thicker. The main uncertainty for the volume calculation is the thickness of the sand.

Over most of the area, the reservoir peak- to- trough thickness is from 11-14 msecs, which is at or below the seismic tuning thickness. Using an assumed interval velocity of 1000 m/sec the gross reservoir thickness from the seismic interpretation is 6-7m. Modelling shows that the some reservoir areas can be as thin as 2-3 m, but without a well to calibrate the seismic velocities this is uncertain.

The mean reservoir thickness used in the volume calculations in Main Bekkeblom and NW segments is 7m with Net/Gross = 1 and this could be an optimistic evaluation.

The main risks for Bekkeblom are trap seal (0.2), reservoir presence (0.5), reservoir producibility (0.7) and source migration (0.9). The Bekkeblom prospect has a weak DFI upgrade giving a total discovery probability of 8% for the segment level (see Table 1).

A CSEM feasibility study was undertaken in order to de-risk Bekkeblom prospect. However uncertainty in EM is large and lack of an anomaly will not give a definite answer. The license decided not to acquire a CSEM survey.

The Iris Lead (Figure 2), described in the 2010 APA application, was downgraded. High amplitude anomaly on a full offset seismic revealed no AVO response and was concluded to be a pure lithological effect.The Iris anomaly is mainly a soft S-impedance layer, which is probably caused by an increase in sand content.

5 RESOURCES

A summary of estimated resources and risks in PL580 is shown in Table 1 and Table 2
Bekkeblom is regarded as the main prospect in the license. Dry gas is the most likely phase with a probabiity of discovery 11,5 % and estimated aggregated mean recoverable volumes of 9,36 MSm^3 o.e. (Table 1).

6 TECHNICAL / ECONOMICAL EVALUATION

The technical and economical evaluation of the project revealed an unattractive business case.

Subsea development with tie-in to Peon (~70 Km) was considered:

- Bekkeblom Main 2 wells + pipeline to Peon
- Bekkeblom North 1: 1 well (tie-in to Bekkeblom Main)
- Bekkeblom North 2: 1 well (tie-in to Bekkeblom North 1)

Bekkeblom Deep targets 1 & 2 and Bekkeblom NW were not included in the Technical Economical evaluation due to limited accumulation sizes, thin reservoir and highly segmented reservoir.

The development solution proved to be challenging due to the expected low reservoir pressure (100 bars) that would make it very vulnerable to liquid production and high risk for waterlocks in the pipeline. The expected net present value (ENPV) was marginal due to the high prospect risk

7 SUMMARY AND CONCLUSIONS

The work programme for the initial period of PL580 has been fulfilled. The seismic data acquisition was acquired within the specified time frame and geological, geophysical studies have been completed.

Geological and geophysical analysis of the new 3D data revealed that the Bekkeblom prospect seismic anomaly was smaller, discontinuous and had a thinner reservoir than initially thought. If a discovery, bekkeblom would be challenging to develop. In addition, the development scenarios have clear technical challenges and the host facility is not yet available. No additional prospectivity has been identified in the licence.

The technical evaluation of the remaining prospectivity in PL580 concluded that small gas volumes in combination with high risk do not justify further exploration in the license. PL580 Management Committee has therefore decided to allow the licence to expire and not commit to drilling a well that would be required to retain the license.

8 FIGURES

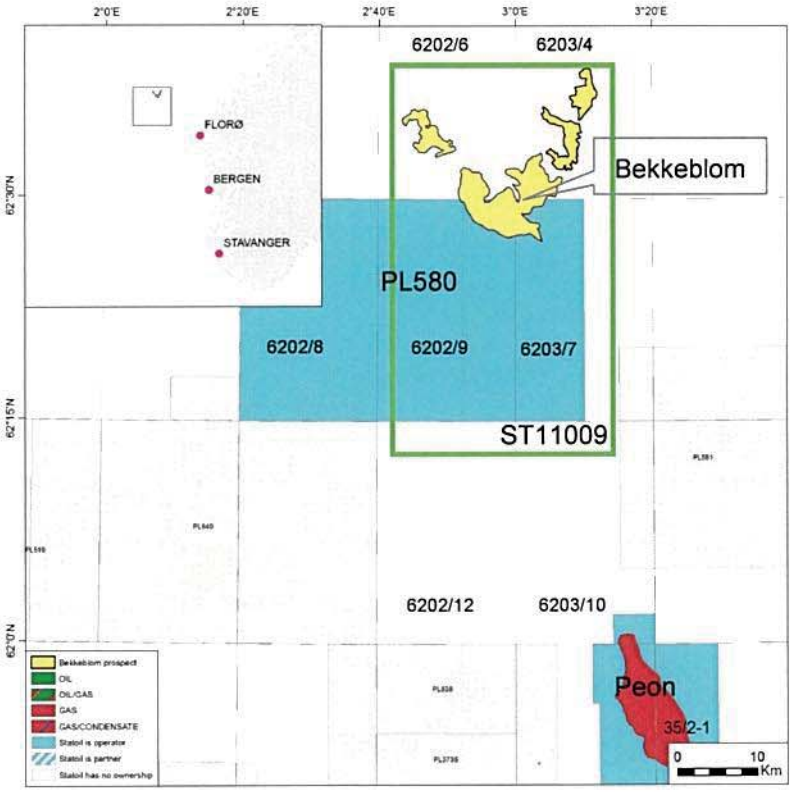


Figure 1: PL580 and Bekkeblom (updated outline) prospect location. Outline of the 3D survey (ST11009).

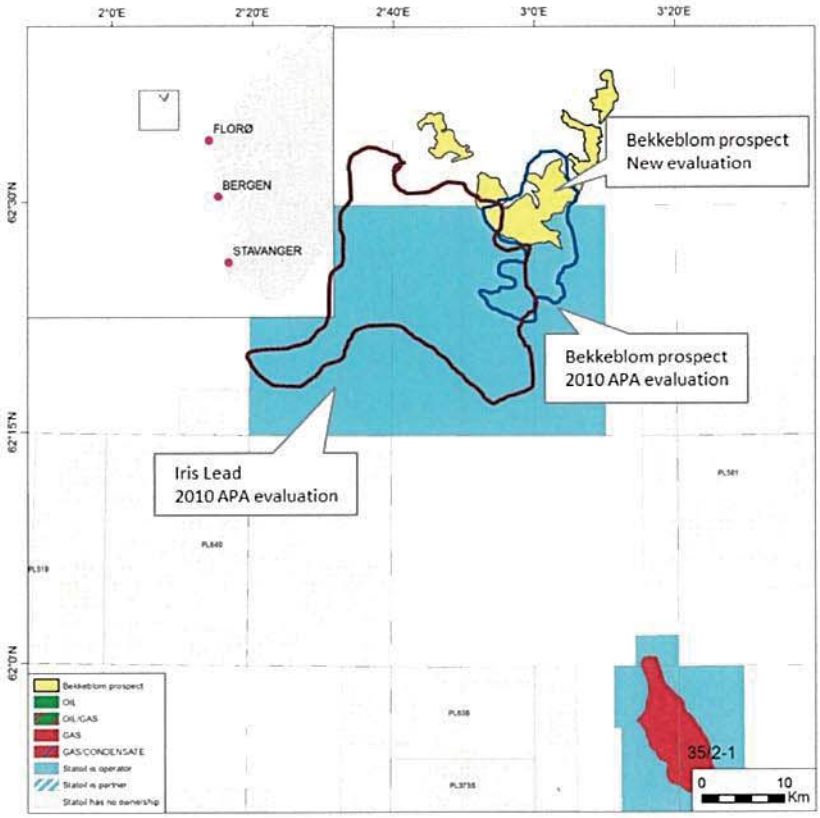


Figure 2: Old and updated Bekkeblom prospect and Iris lead outlines

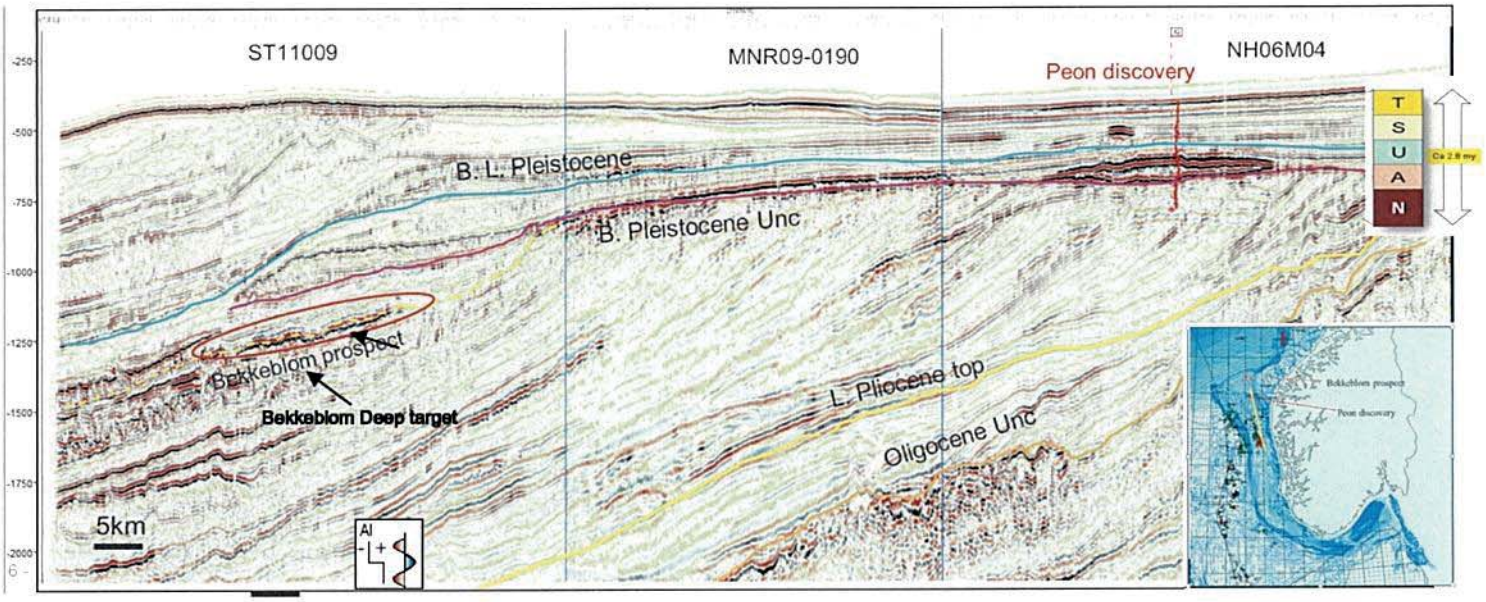


Figure 3: North-south composite seismic section (TWT) illustrating Bekkeblom prospect location. North towards the left.

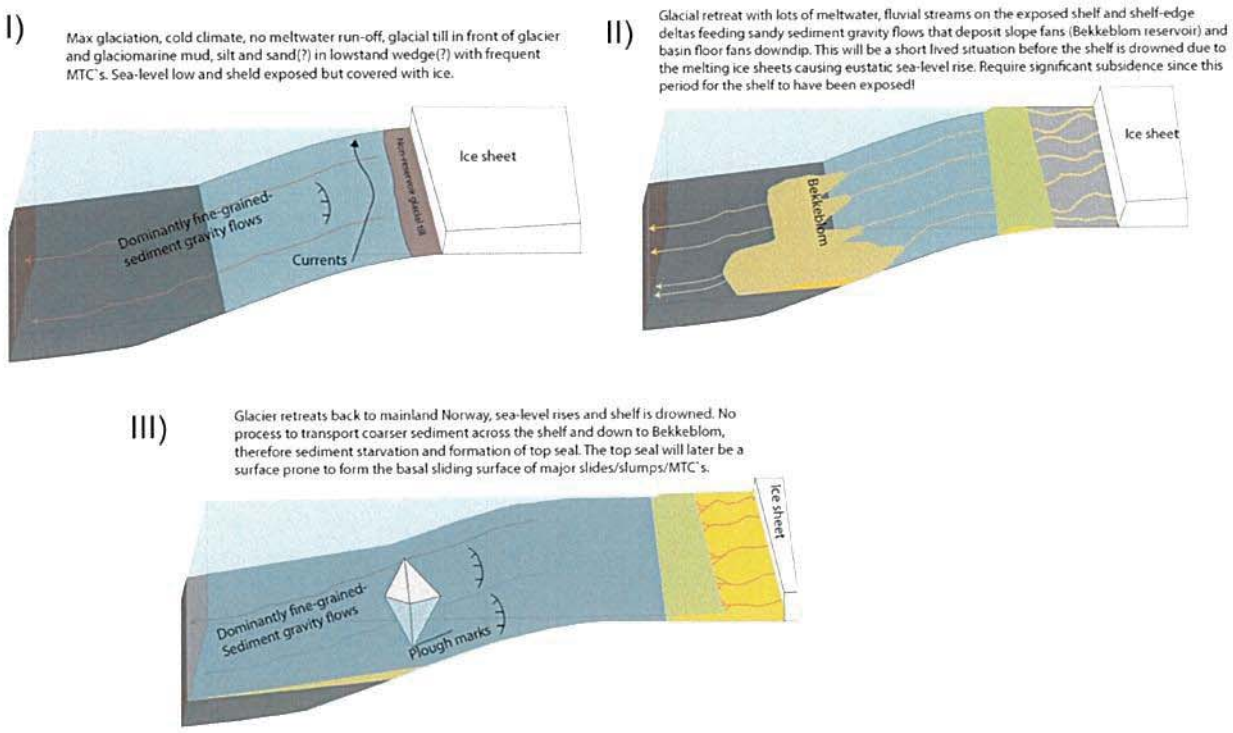
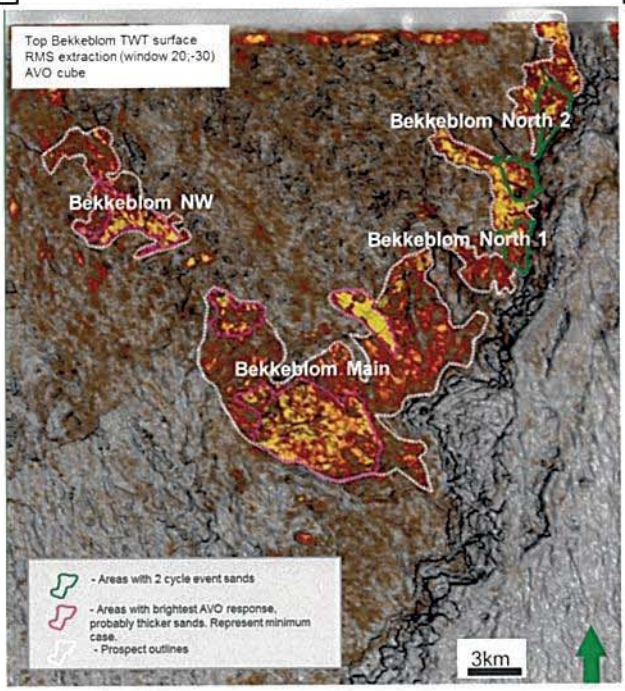


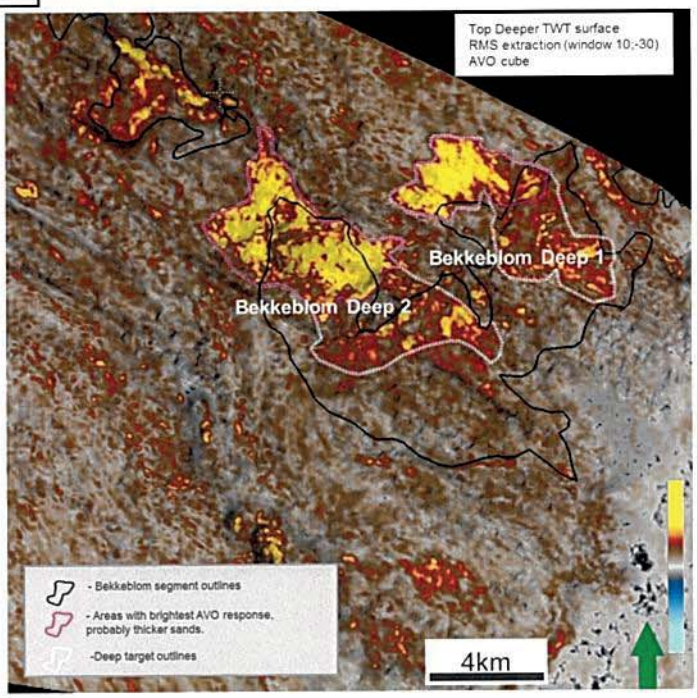
Figure 4:Bekkeblom prospect depositional model

A Bekkeblom segments



- 4 separated segments
- Bekkeblom Main is the volume driver

B Bekkeblom deep segments



- 2 segments
- Similar to Bekkeblom level prospects
- Located 40 – 60 ms below Bekkeblom Main

Figure 5: Bekkblom prospect segments defined on AVO maps. High amplitudes show where the reservoir is interpreted to be gas-filled.

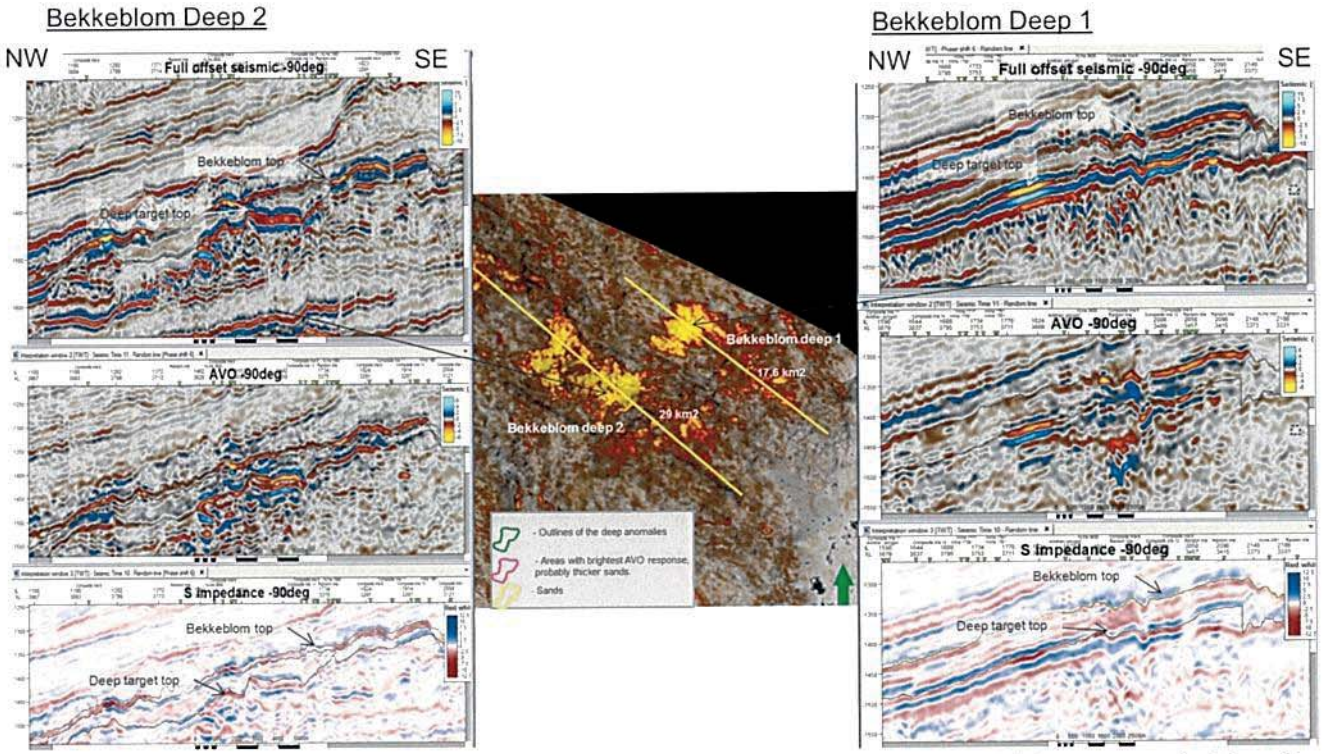


Figure 6:Bekkeblom deep segments. Figure shows two deep amplitude anomalies, which are separated from the Bekkeblom Main level (see Figure 3 and 5) by transparent, most likely shaly layer.

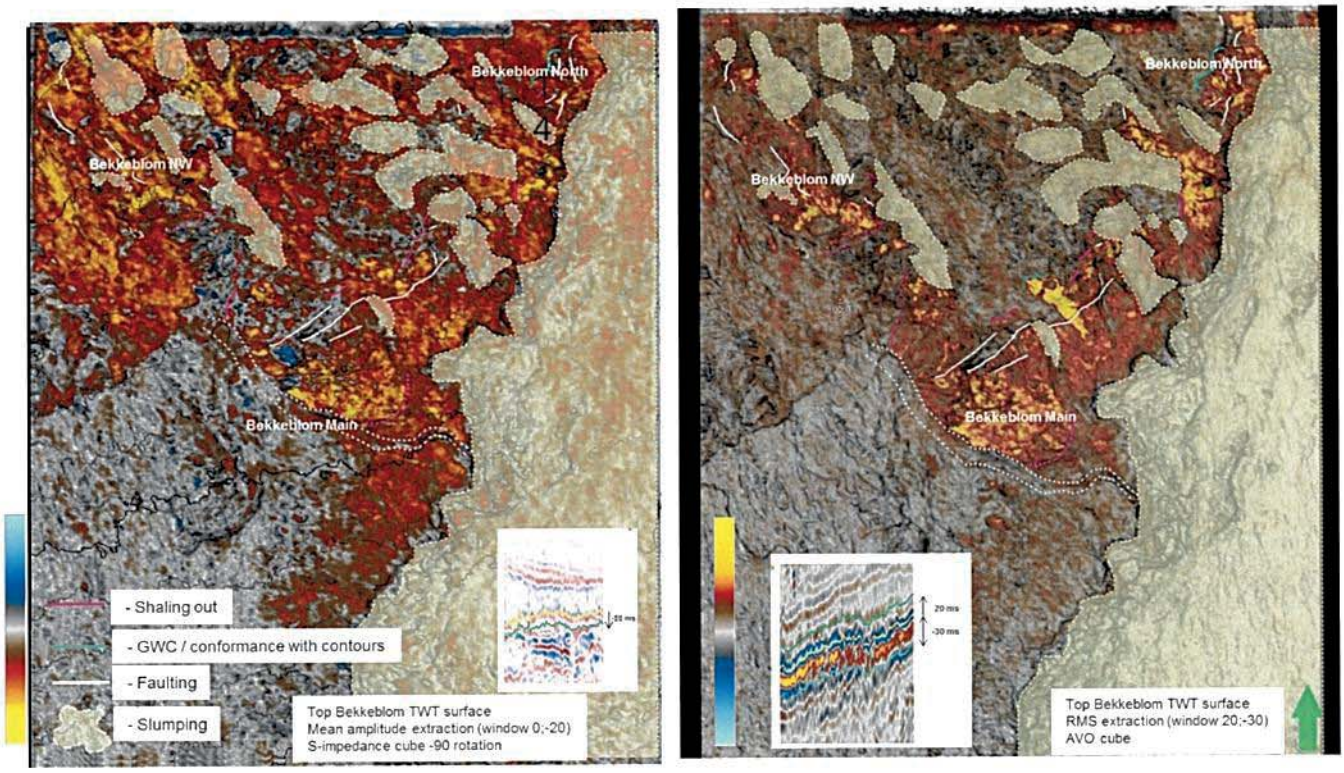


Figure 7: Trap observations, non conformance with time contours. S-impedance map (left picture) is interpreted to have high amplitudes where sandstones / siltstones are present. The right picture shows the AVO response and this is interpreted to be high amplitudes where the reservoir is gas-filled. Amplitudes terminate down-dip towards the NW for a variety of reasons as shown in the figure.

Table 1: Estimated risk for the identified prospect in PL580

		TFO (2010) One anomaly	Risking (2012) Segment Level	DFI Segment Level	
Trap	Seal	0,4	0,2		The general impression is that this is a good strat trap, very mud/shale rich system. Wells in the area only show very low percentage of sand in the Plio – Pleistocene succession AVO study suggest the possiblity for low saturation gas > leakage Pressure plots show that the proposed gas columns for the Bekkeblom prospect will not cause any fracture risk as long as the aquifer is normal pressured. However a minor over-pressure in the aquifer will cause a high fracture risk
	Geometry	0,8	1,0		Stratigraphic trap, geometry is not an issue
Reservoir	Presence	0,8	0,5		S-impedance indicates sands, but there is a risk for a silty reservoir
	Producibility	1,0	0,7		Risk for segmentation and very thin reservoir (single cycle event, tuning observed Consider horizontal producers positioned as close to the top of the reservoir to avoid rapid pressure drawdown and early water break through. Considered technically feasible but challenging
Source	Presence	1,0	1,0		Biogenic gas. Modelling suggest that area has the required conditions to generate biogenic gas. Presence proven by Peon discovery
	Migration	0,45	0,9		Area looks like a clear gas region (ref. Dag Lundqvist and Roar's chimney cube). The area around Bekkeblom is considered to be the drainage area for Peon AVO confirmed the presence of gas
TOTAL		0,12	0,063	0,082	Weak DFI based on AVO study

Table 2: Prognosed resources and risks for Bekkeblom prospect segments

Well:		***Prospect name:***			Bekkeblom				
Prospect	Prospect segments	In-place res. (MSm^3OE) 100%, Total Structure			Recoverable res.(Vg) (MSm^3OE) 100%, Total Structure			Pg	
		P90	Mean	P10	P90	Mean	P10	%	
Bekkeblom	Bekkeblom Main	6,9	9,7	12,5	4,2	6,0	7,8	6,3	
	Bekkeblom North 1	2,3	3,3	4,5	1,4	2,1	2,8	6,3	
	Bekkeblom North 2	1,5	2,3	3,1	0,9	1,4	1,9	6,3	
	Bekkeblom NW	0,8	1,2	1,7	0,5	0,7	1,0	6,3	
	Bekkeblom Deep target 1	1,2	1,8	2,6	0,7	1,1	1,6	6,3	
	Bekkeblom Deep target 2	2,7	3,7	4,8	1,7	2,3	3,0	6,3	
Bekkeblom prospect level Aggregated volume and risk		6,7	15,1	23,2	4,1	9,4	14.43	9,6	11,4

Kind regards
Statoil ASA

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PL 580 Management Committee chairman