

# Relinquishment Report PL524 & PL524 B Blocks 6606/2, 6606/3 & 6706/12

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 1 of 8



#### 1 INTRODUCTION

The initial period for Production Licence PL524 & PL524 B expired May 15th 2012. The partnership has unanimously decided to fully relinquish the acreage.

#### 2 BACKGROUND AND LICENSE HISTORY

Production Licence (PL) 524 was awarded 15<sup>th</sup> May 2009 to partners Statoil (75% Operator) and ConocoPhillips (25%). Work obligations were to acquire a minimum of 400km<sup>2</sup> of 3D seismic data and to make a drill or drop decision within three years (15<sup>th</sup> May 2012).

An area extension to the north was applied for and Production Licence (PL) 524 B was awarded 13<sup>th</sup> May 2011 to partners Statoil (75% Operator) and ConocoPhillips (25%) no additional work commitment was attributed to this extension.

Production Licence 524 is located in Blocks 6606/2 and 6606/3 total of 433.628km<sup>2</sup> and PL524 B is situated in block 6706/12 total area of 28.356 km<sup>2</sup> (Fig.1).

PL524 and PL524B are immediately to the south west of the PL218 licence with the Aasta Hansteen discovery. In terms of structural setting it covers the southern part of the Nyk high (Fig. 2).

#### 3 TECHNICAL WORK AND MEETINGS

A new 3D seismic survey "ST10004" of 400km<sup>2</sup> covering PL 524 was acquired summer 2010 (Fig. 2) this was a work commitment for the licence. Fast track processed data was available beginning of September 2010. Full time processed data was received beginning of January 2011. PSDM project was performed on the data; this was received late June 2011.

Database: 2D regional seismic lines. 3D seismic survey. PSDM on 3D seismic survey. Wells: Luva, Haklang, Snefrid South, Hvitveis, Vema.

The main prospect in this licence is the Harald prospect. This is an Upper Nise reservoir on a tilted fault block.

Technical work has been undertaken based on 3D and 2D data. Seismic mapping confirms this is a structural trap similar to the Haklang discovery, 20 km to the north east in PL218. The prospect evaluation process has consisted of seismic interpretation, AVO studies, depth conversion, regional sedimentology study, volume calculation, risk evaluation and technical economical evaluation.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 2 of 8



Management (MC) and Exploration Committee (EC) meetings have been held:

MC: June 04<sup>th</sup> 2009
 EC: June 25<sup>th</sup> 2009
 EC / MC: November 05<sup>th</sup> 2009
 EC: April 08<sup>th</sup> 2010

EC: April 08 2010 EC / MC: May 21<sup>st</sup> 2010 EC: July 16<sup>th</sup> 2010

EC / MC: November 16<sup>th</sup> 2010
 MC / EC: May 04<sup>th</sup> 2011

Work meeting:

Cotober 07<sup>th</sup> 2011

Cotober 11<sup>th</sup> 2011

November 11<sup>th</sup> 2011

November 29<sup>th</sup> 2011

#### 4 PROSPECT EVALUATION

The Harald prospect is a Top Nise reservoir on a tilted fault block. The prospect is located in the central part of PL524, approximately 20 km south-west of the Haklang, Luva and Snefrid South discoveries. The Haklang discovery is an analogue to the Harald prospect, a rotated fault block where the main target is the Campanian Nise Fm.

The Nise reservoir unit is interpreted to be composed of turbiditic sandstones, deposited as a large deep-sea fan system of Upper Cretaceous (Campanian) age. It was deposited across a large part of the Vøring Basin. The Nise reservoir has been proven in the nearby Luva, Snefrid South, Haklang and Vema wells.

The prospect is interpreted to be a fault bounded structural trap. The prospect is defined to the north by a SW-NE trending fault. The fault extension to the West and to the East is uncertain due to poor seismic resolution under remobilized ooze bodies. A large vent feature is present to the East of the prospect, creating a risk of trap breaching. The key risk to the Harald segment is the lack of DFI response, which has resulted in a strong DFI downgrade being applied.

The Harald prospect was identified on regional 2D lines as a tilted fault block similar to Haklang. The Harald prospect was one of the key drivers for applying for PL524.

Based on evaluation of the new 3D seismic survey (ST10004), the structural definition of the prospect is in alignment with previous evaluations; (Fig. 4) a rotated fault block. A revised prospect data table is provided Fig. 6.

The prospect is mapped on good quality 3D PSTM and PSDM data, but parts of the prospect lie in a "bad data" area due to remobilized ooze bodies in the shallow overburden. In addition, deeper lying sills and associated vent features are present within the eastern part of the prospect outline.

The risk on trap geometry is related to the seismic definition of the north-western bounding fault in this bad data area, especially in the westernmost part of the structure where the fault throw gets smaller. Apex is mapped at 2990m and structural spill point is mapped at approximately 3500m.

The Harald segment is capped by a thick Campanian shale sequence, proving a competent seal in the Luva, Snefrid and Haklang discoveries. The risk on trap seal is related to possible late movement on the bounding fault, and to the presence of hydrothermal vents within the closure representing points of seal failure. The **probability for effective seal is 0.49**.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 3 of 8



Presence and quality of effective reservoir is not assumed to add exploration risk to the Harald segment. Top Nise sandstone is with high confidence interpreted to be present in Harald. Any variance of reservoir properties is handled in the gross rock volume considerations (GRV), the **probability for effective reservoir is 1.0**.

Although not penetrated, source rock and migration to Harald is not deemed to have high risk. A working hydrocarbon system is proven in the area by nearby discoveries; all the discoveries made were filled to spill. The discoveries in the area are all gas, and geochemical analysis suggests gas is the only hydrocarbon phase likely to be found in the area. The kitchen area is estimated to be from the Vågrind and Nygird synclines. A small risk on migration is related to the possibility of Harald lying in a migration shadow for gas migration further into the Luva/Haklang/Snefrid area, **probability for source / migration is 0.9**.

Based on evaluation of the new 3D seismic survey (ST10004), no strong amplitude response, no amplitude conformance with structure or flat event observed. All other discoveries in the area in upper Cretaceous portray a strong seismic fluid response. Part of the Harald segment is within the poor data area and this can to a small extent explain the lack of a DHI. The eastern part of Harald is however covered with good data and is without fluid anomalies while clear small gas caps can be identified immediately down flank of the prospect. The conclusion of the interpretation and LFP work on Harald is clearly negative and this is reflected in a marked DFI downgrade of the Harald segment with a DFI downgrade strength of 0.22.

The aggregated chance of success for Harald is 0.126.

#### 5 RESOURCES

Volume calculations were made for the Harald segment (Top Nise). The mean **recoverable volumes** are 21.7 MSm3 oe (Fig. 6).

### 6 TECHNICAL / ECONOMICAL EVALUATIONS

The development plan would be 4 vertical gas producers tied back to Luva. 4 slot template. Processing and gas transport by tariff.

The Net Present Value (NPV) for Harald is marginally positive, but due to very high exploration risk, the risked NPV (ENPV) becomes close to zero.

#### 7 SUMMARY AND CONCLUSIONS

The work programme for the initial period of PL524 and PL524B has been fulfilled and agreed by the partnership.

The main reason for proposing to relinquish the licence is a very low chance of success (Harald Pg 12.6%) due to no signs of a DFI response while nearby discoveries all have a clear DFI response at this level.

All communication in the partnership is found on Licence 2 Share, the seismic dataset ST10004 is loaded in PetroBank.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 4 of 8



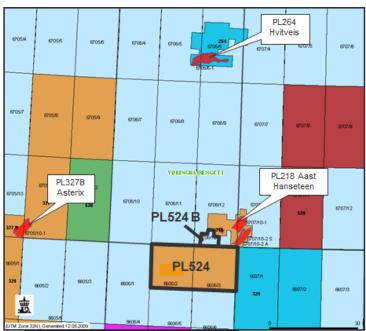


Figure 1: Location of PL524 and PL524B.

## Nise TWTT Structure with Structural Attribute Overlay

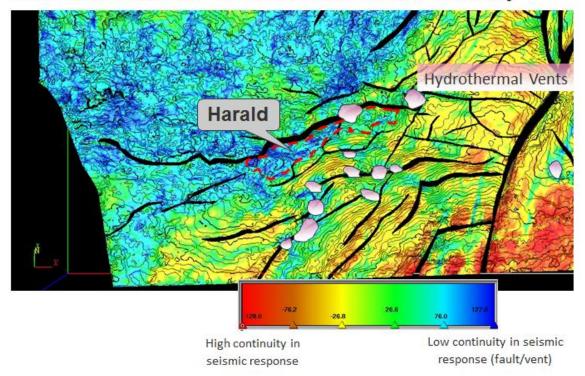


Figure 2: Structural map of PL524. Showing the location of Harald. The licence is situated on the southern part of the Nyk high.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 5 of 8



Vessel PGS Vanguard 12 streamer x 100 m Streamer length: 4500 m Streamer depth: 8 m Source depth: 7 m Shot point int: 18.75 m flip-flop Time recording: 7 sec

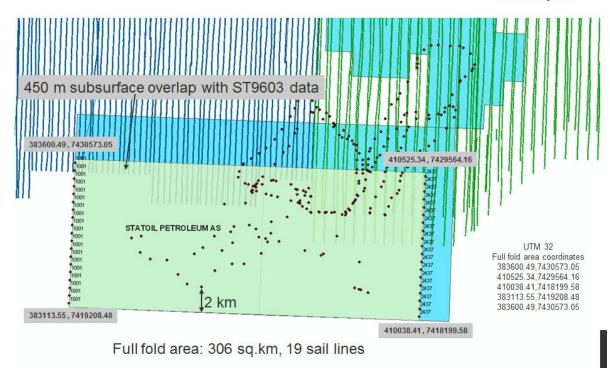


Figure 3: Outline of ST10004 shown in light green. To the north the survey is merged with the ST9603 data.

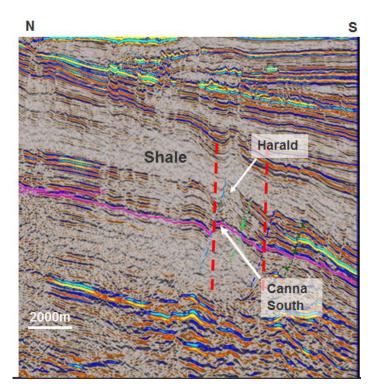


Figure 4: 3D seismic line over the Harald prospect. The prospect is on a tilted fault block.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 6 of 8



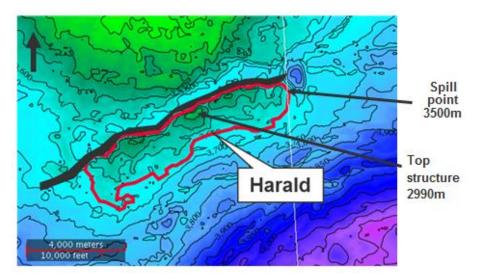


Figure 5: Tope Nise depth map showing the polygon for the Harald segment. The prospect is trapped to the north by a normal fault. The crest of the structure is at 2990m. The spill point for the structure is controlled by the vent on the eastern flank of the segment the spill point is at 3500m.

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 7 of 8



Figure 6: Prospect data table.

구입 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전	Dropped Mama	Discould Bross / Lead		
2 7 7 1 2 7 7 1 2		Discovery Frospy Lead		
PL524 & PL524 B	нагаю	Prospect		
P lay (name/new)	Stru	Structural element	Company	Year
Campanian	Tilt	Tilted fault block	Statoil, ConocoPhillips	2012
Oil/Gas case		Re	Resources IN PLACE	
		Low	Base	High
MSm3 0E		9,50	31,10	59,50
			Resources RECOVERABLE	
		Low	Base	High
MSm3 OE		6,60	21,70	41,10
Type of trap	Wai	Water Depth (m)	Reservoir Chrono	Reservoir Litho
Stuctural		1300	Campanian, Upper Nise (Nyk76)	Sandstone
Source Rock, Chrono	Sour	Source Rock, Litho	Seal, Chrono	Seal Litho
Cretacous or Jurassic	Unk	Unknow (shales?)	Campanian	Shales
Seismic database (2D/3D):		3D seis	3D seismic survery and PSDM	
	Probability of	Probability of discovery: 0.126 (including DFI downgrade)	DFI downgrade)	
Technical (oil+gas case)		Gas case	Prob for gas case:0.9	
Probability (fraction):	Reservoir (P1)	Trap (P2)	Charge (P3)	
	1.0	0.49	6:0	
Parametres:	Low	Base	High	
Depth to top of prospect (m)		2990		
Reservoir thickness (m)	Nise is thick so	and c1000m (depth vs volu	sand c1000m (depth vs volume used for volume calculations	
HC column in prospect (m)	461	404	529	
Gross rock vol. (10x9 m3)	497		229	
Net / Gross (fraction)	0.65	0.827	6:0	
Porosity (fraction)	0.205	0.255	0.305	
Gas Saturation (fraction)	0.77	0.823	0.873	
Gas Expans factor (1/Bg) SM3/m3	242.6	262.6	282.6	
Recovery factor, main phase	0.58	0.68	0.78	

Classification: **Internal** Status: Final Expiry date: 2013-08-02 Page 8 of 8