License Relinquishment Report, PL503

LOTOS Exploration & Production Norge

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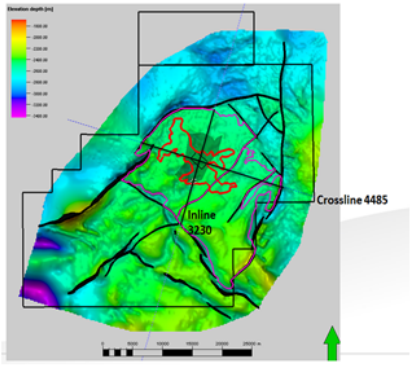
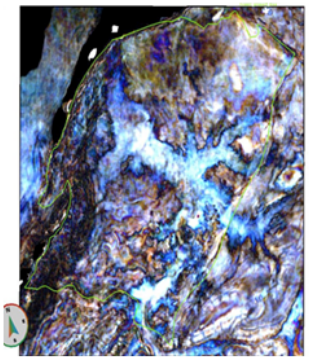
1. Key license history

SUMMARY OF PL503, B,C, Block 17/5,17/6, 17/7, 17/8, 17/9

Edison Norge AS	25%
Skagen44 AS	25%
Lotos Exploration and Production Norge AS	25%
Lime Petroleum Norway AS	12.5%
North Energy ASA	12.5%





Barlind Prospect is the key prospect
Recoverable prospects: P(90)= 13, P(Mean)=26, P(10)=41.10^{6}SM^{3}

Reservoir	Reservoir quality	Trap/Seal	Source and Migration	Overall risk
Shallow marine tidal influenced sandstones of Upper Middle Jurassi 85 %	Eq. to the Sverdrup Hugin Formation (timetransgressive) 85 %	Geomery mapped on new 3D and sealed by upper Jurassic shales 70 %	Main: Draupe Formation source and migration in upper Jurassic sandstones from Southen Viking Graben/ Sleipner Terrace 40 %	20 %

Figure 1 PL503 license overview

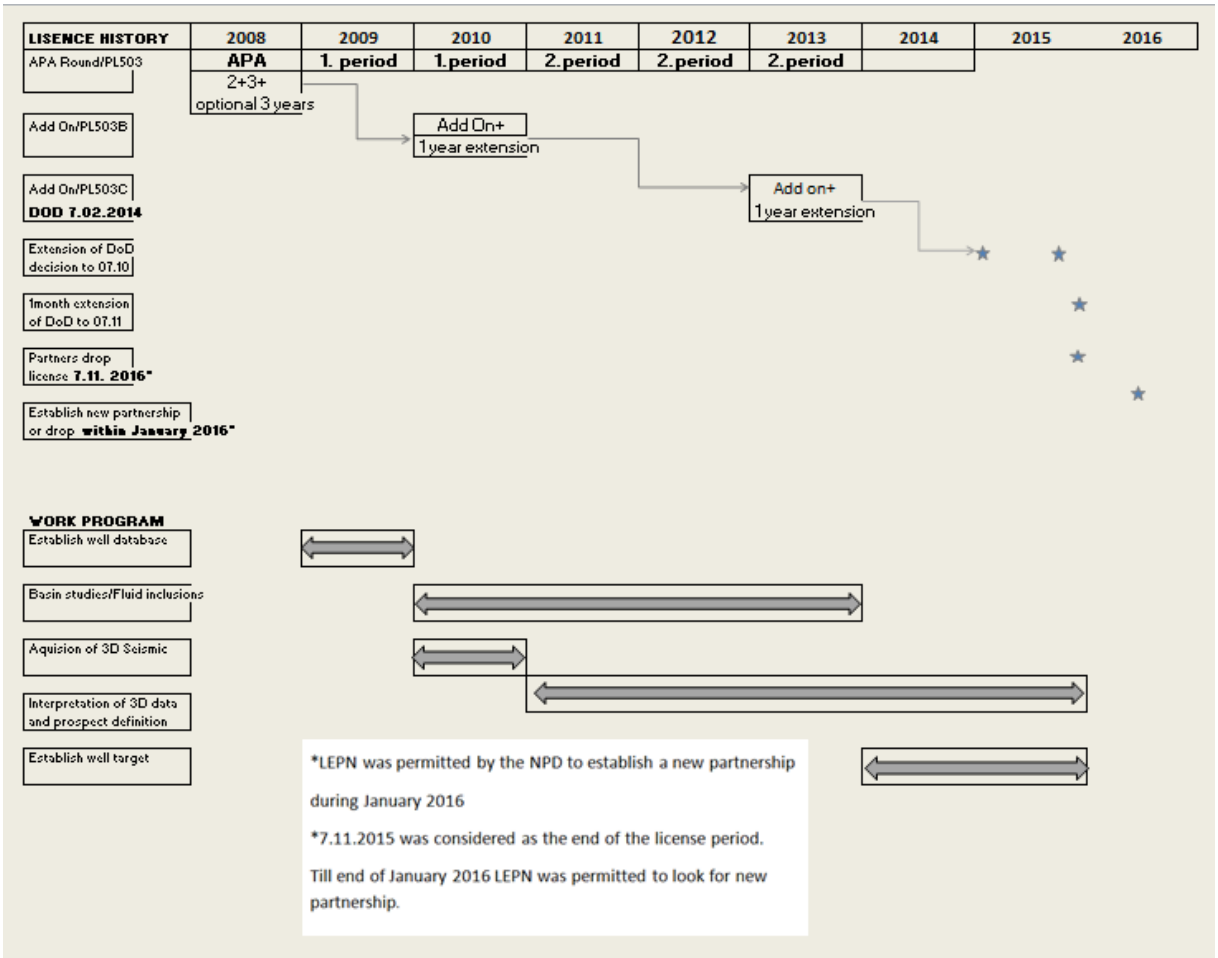


Figure 2 Work program and extensions

The PL503 license was awarded on the 23rd January 2009 as a result of the APA 2008 licensing round application. In 2009 the license partners decided to apply for add acreage, this was awarded in 2010 with the LEPN as the operator (25%) and partners; Skagen44 (25%), Edison (25%) and North Energy (25%). A similar decision to apply for add on acreage was made for the in APA 2013. This was awarded and with the same license holders. At a later stage Lime Petroleum acquired 12,5% interest from North Energy (Figure1)

The partners in the license did not support LEPN recommendation to drill the well based on the technical work and the economic evaluations. All work obligations have been completed.

A summary of the technical work in the license is provided in chapter 3, 4 and 5.

Table 1 shows an overview of the meetings in the license is presented.

The original deadline for the DoD decision was the 7rd October 2014 (3 months prior to the license expire as stated in the JOA). LEPNs and partners applied for a 12 month extension of this deadline, this was granted by the MPE and NPD until the 7rd of October 2015 (Figure 2).

To make the final decision an additional month was applied for in October 2014. This extension was granted by the MPE, i.e. the final DoD was on the 7th of November 2015

The license has fulfilled all of the work commitments; .i.e. Acquisition of 3D seismic data, low frequency seismic processing and G&G work.

Meetings held in the license

2009		MEETING PL503 A,B.C
EC/MC	13.feb	Start up meeting
EC/MC	03.mar	Exploration strategy/budgets
WM	08.mai	Discussion geochemy and petrophysic work
WM	08.jun	APA , Extension of Pl503
WM	07.sep	APA , Add-on 2009, Work program 2010
wM	13.okt	Geochemical workshop
MC/EC	21.okt	Recommendation and decision next phase -3D seismic
2010		
MC	10.mar	3D survey
MC/EC	02.sep	Status Budget , 3D survey
MC/EC	13.nov	Budgets and 3D acquisition
2011		
EC	17.mar	LO1101 3D acquision and processing
EC/MC	22.sep	LO1101 3D acquision and processing/work program and budget
2012		
MC/EC	22.mai	LO1101 Process, special study program
MC/EC	23.nov	Work plan and Budgets/ Long distance migration and DNME method
2013		
WM	23.apr	Low FreqData
EC	05.jun	Budgets and workprogram/ status seismic interpretation
MC/EC	27.nov	Budgets and workprogram/ status seismic interpretation
2014		
EC/WM	26.mar	Work plan/ status interpretation/Low frequency study
WM	13.okt	New depth conversion model/ status interpretation
MC/EC	03.des	Drilling Recommendation and DoD decision
2015		
WM	12.mar	Prospect definision and indicators/Partners presentation
WM	29.mai	Prospect evaluation and economical evaluation
MC/EC	25.jun	Prospect review and drilling recommendation/ Budget status
MC/EC	04.nov	Drilling Recommendation and DoD decision

Table 1: Summary of license meetings for the PL503

2. Database

In 2009 the license data base includes all publically available seismic and well data. The outline of the database is shown below (Figure 3):

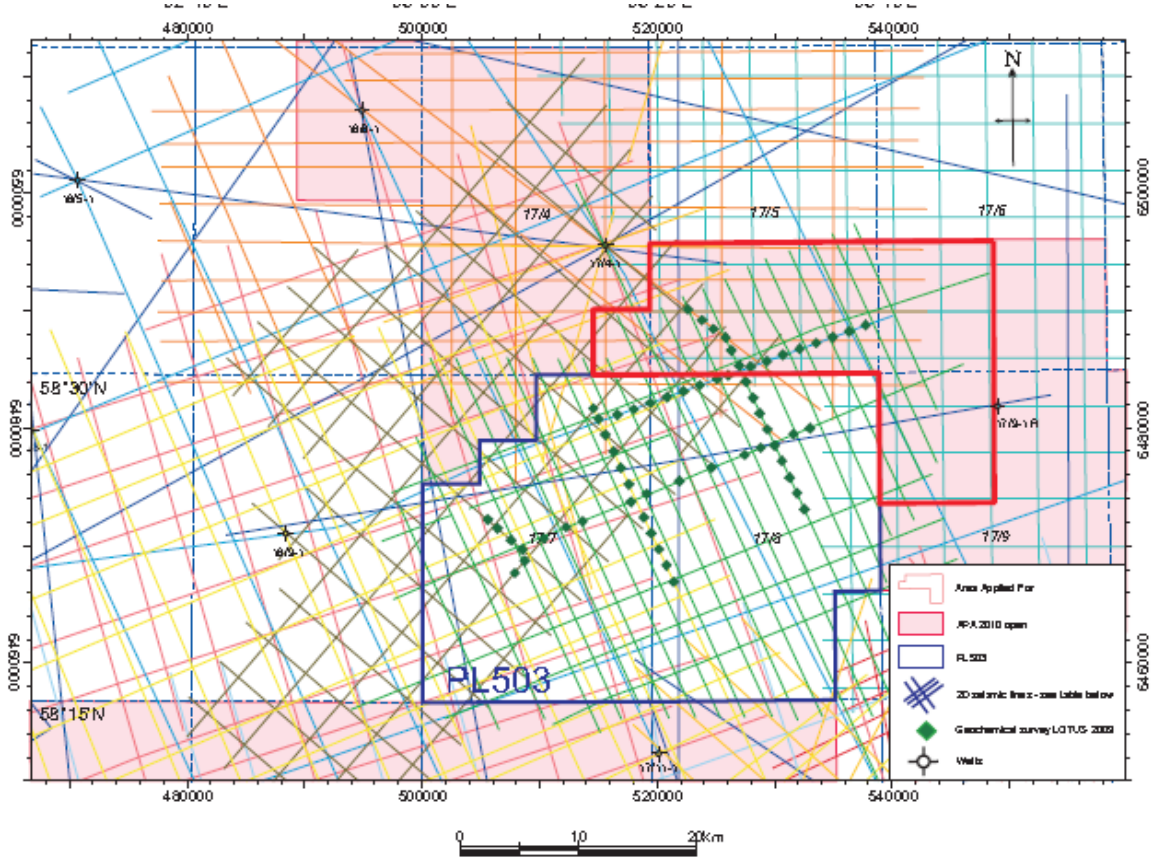


Figure 3 Overview of the 2D seismic (and the geochemical sample points) used

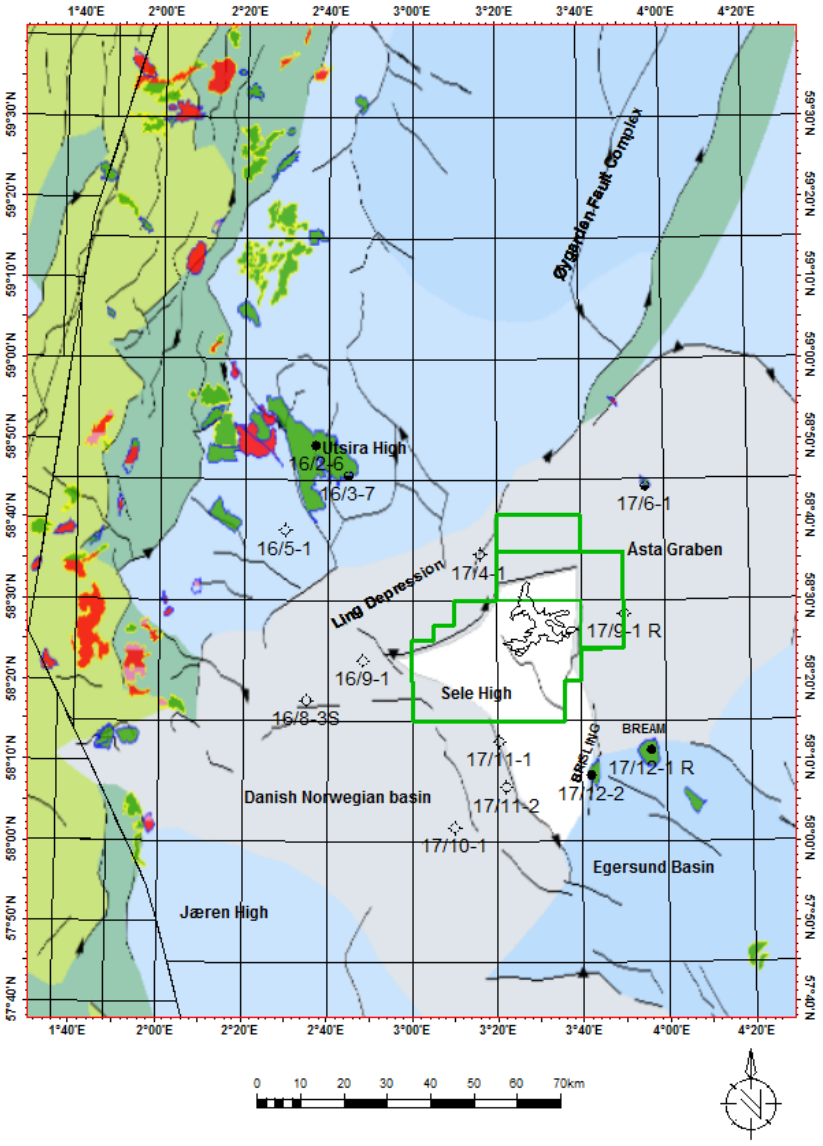


Figure 4 Map with the well data used in the Sele High studies

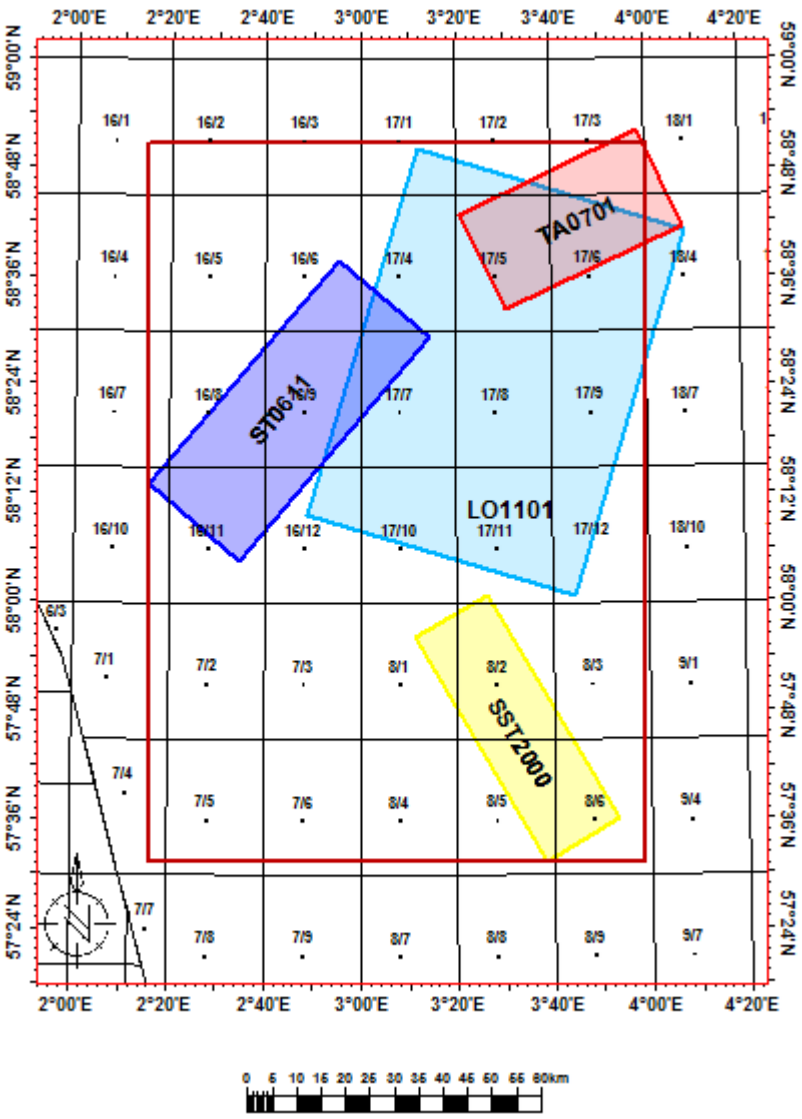


Figure 5 Outlines of the LO1101 survey and the three 3D surveys in the merge (Red outlines)

The LO1101 Seismic Survey was completed early 2011. The survey covers most of the license , with an extension to the add on acreage to the north. The add on application in APA 2013 was interpreted on the merged shown in Figure 5.

Well data

The well data base is presented in Figure 4 and includes the well surrounding the Sele High. The geological information from the Lupin well was not included in the technical work.

3. Review of geological framework

Several prospects have been identified within the PL503 license. The prospects, the PL503 acreage, and the area covered by LO1101-3D seismic survey have been mapped extensively to improve the understanding of the structural and depositional history of the area (Figure 6 and 7).

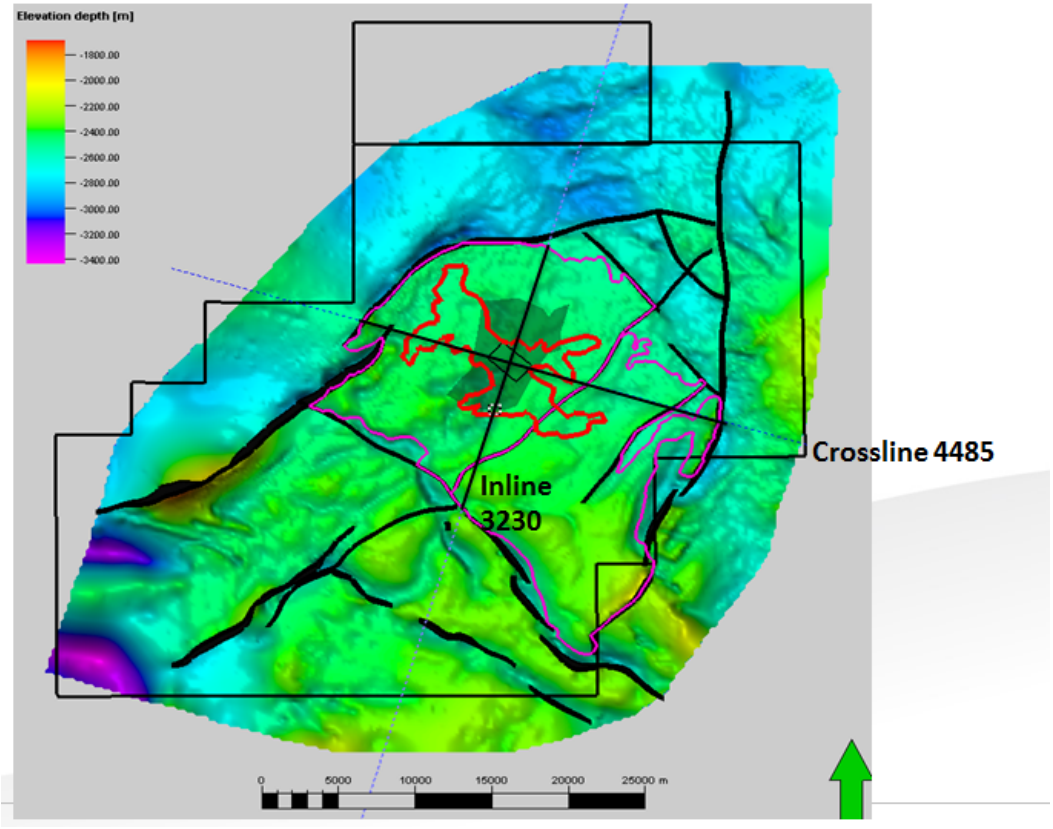


Figure 6 Intra Jurassic depth map with outlines of faults and the Barlind Prospect (Inline and crossline)

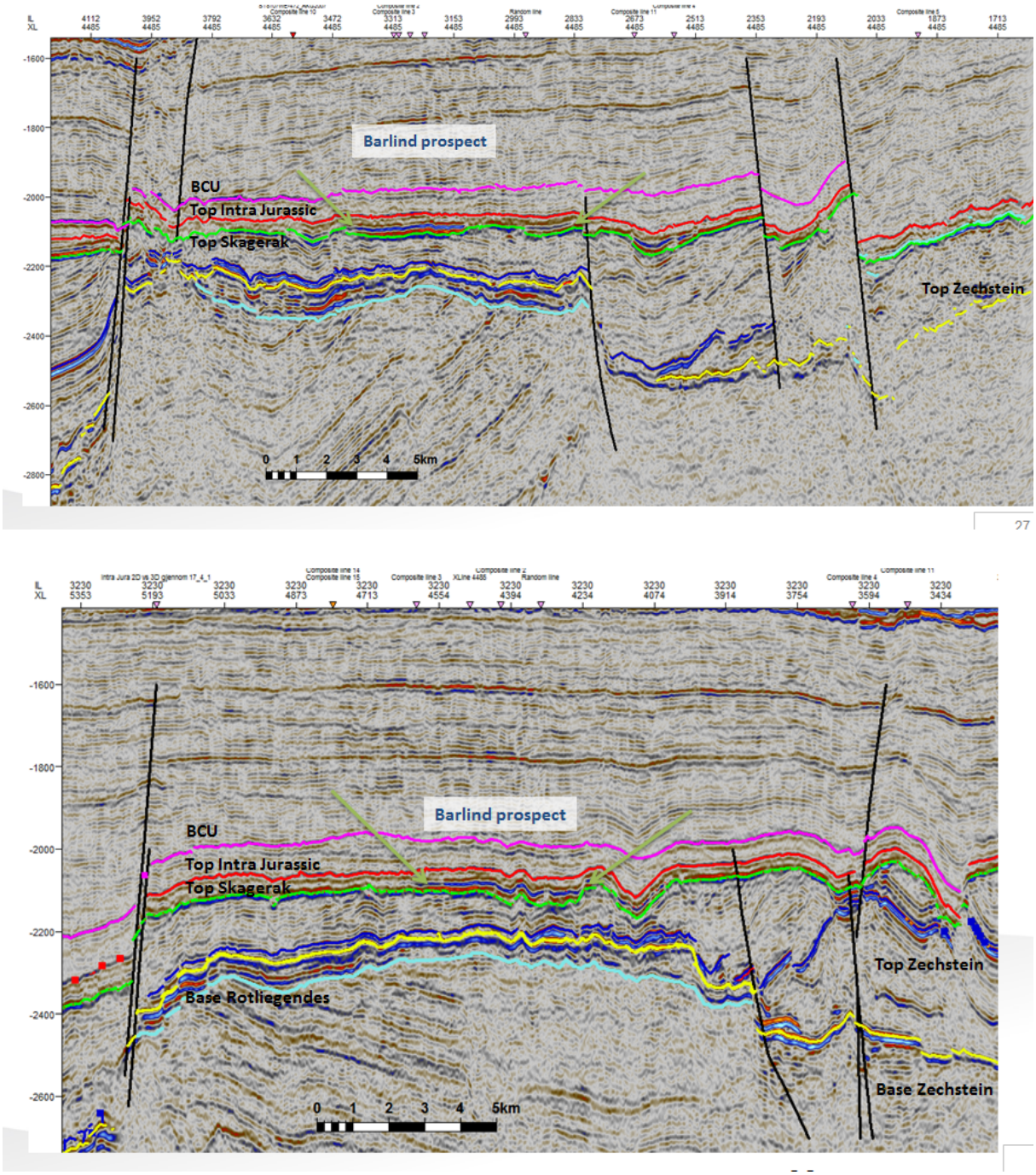


Figure 7 Seismic line through the prospect

Key horizons were defined and interpreted within the Jurassic and Paleozoic sequences to identify reservoir sections within the 3 main prospective sequences. Maps are made for: the BCU, the Intra - Jurassic, top Triassic, top Zechstein, top Rotliegendes and base Rotliegendes. Additional horizons within the Tertiary, and Cretaceous (Shetland Group) have been

mapped in the overburden. Faults have been traced and interpreted from Devonian to Cretaceous levels in order to understand the key tectonic active periods and possible effects on sediment deposition, source maturity, and migration and retention of hydrocarbons (Figure 8).

The Barlind prospect is defined as a combined structural and stratigraphic trap of Upper Intra Jurassic age, interpreted to be an equivalent to the shallow marine Sandnes Formation. The prospect is well defined based on the 3D seismic interpretation. Well correlation from nearby wells and seismic stratigraphic evaluation suggest a high probability of reservoir presence and the reservoir sandstones are interpreted to be a Sandnes / Hugin Formation equivalent. Upper Jurassic shales are expected to seal the prospect**.** In order to understand the source and migration, and to understand if there are hydrocarbons present within the prospects, several (semi) regional studies have been performed

1. Study of the tectonic history of the area based on seismic interpretation of LO1101-3D. A summary of the geological framework based on the current understanding of the license area is presented as a timing diagram in Figure 8.
2. Regional basin modeling over the Sele High and Stord Basin performed by MIGRIS AS in 2008/2009 and 2014, concluding that a possible Paleozoic source will generate gas and could be active in this area. If the Sele High is sourced from the upper Jurassic Draupne Formation as the “Utsira High” this has to be migrate from the Sleipner Terrace in the Southern Viking Graben, the Stord Basin or the Egersund basin
3. Geochemical study concludes that there most likely is an active petroleum system on the Sele High. (Sea bottom mud samples). The samples were collected along the western fault and in observed gas leached areas on the seismic.
4. Low frequencies a possible indirect hydrocarbon have been evaluated in different stratigraphic levels. The concentration of low frequency (7Hz) amplitudes is per definition a possible indicator of hydrocarbons. This is a methodology systematically used by some companies. Areas with low frequency amplitude were detected in Permian and Jurassic levels. The theory behind this is unclear.
5. Proper AVO analyses were not showing any indication of hydrocarbon. The major problem with this analyses are the lack of good well calibration, as none of the surrounding wells can be tied to the 3D- seismic survey. This of course left the analyses with no clear conclusion.

On the Sele High, there are no direct ties, however we have been trying to apply different methods of de-risking the area. But still there are - and will be - a lot of uncertainties. To further de-risk the prospect on Sele High a well is needed. The new 3D has given a new understanding of the structural development, lithostrategraphy, internal geometries and faults. We have achieved a more realistic understanding of the complexity on the Sele High and a more capable to predict the uncertainties.

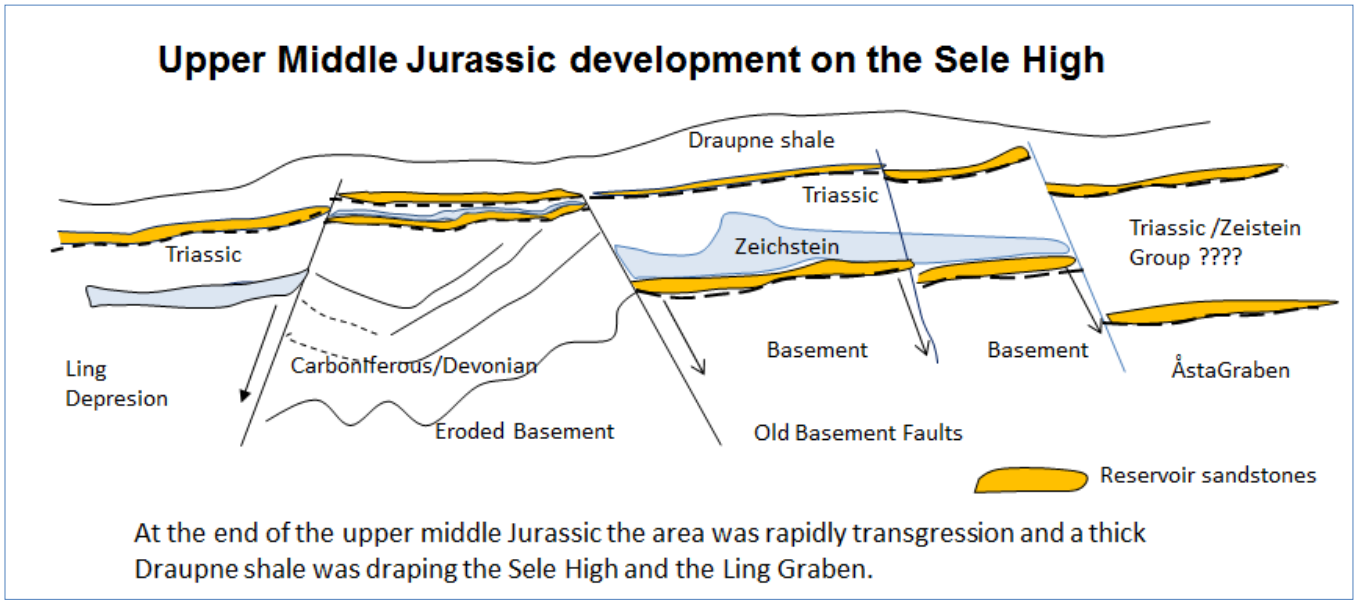


Figure 8 Time structural development on the Utsira High

4. Prospect update - chronological

Original mapped prospectivity pre-award:

The prospectively defined for APA 2008 application relates to the Paleozoic Valberget prospect. This prospect comprises three reservoir intervals. The Carboniferous / Devonian was defined as the main prospect, whilst the Zechstein carbonates and Rotliegendes sandstones were defined as the secondary prospects. A schematic cross section is presented in Figure 9 . Interpretation of horizons on 2D lines is shown in Figure 10. The prospect evaluation of the Valberget closure are shown in Table 2 .

Interpretation of these horizons on the new 3D seismic survey has increased the uncertainty in the original closure at these levels. The uncertainty of the closure and the dry well 16/8-3S, the Lupine well, encountering poor reservoir quality in the Permian section, lead to change of focus on the prospectively of the license.

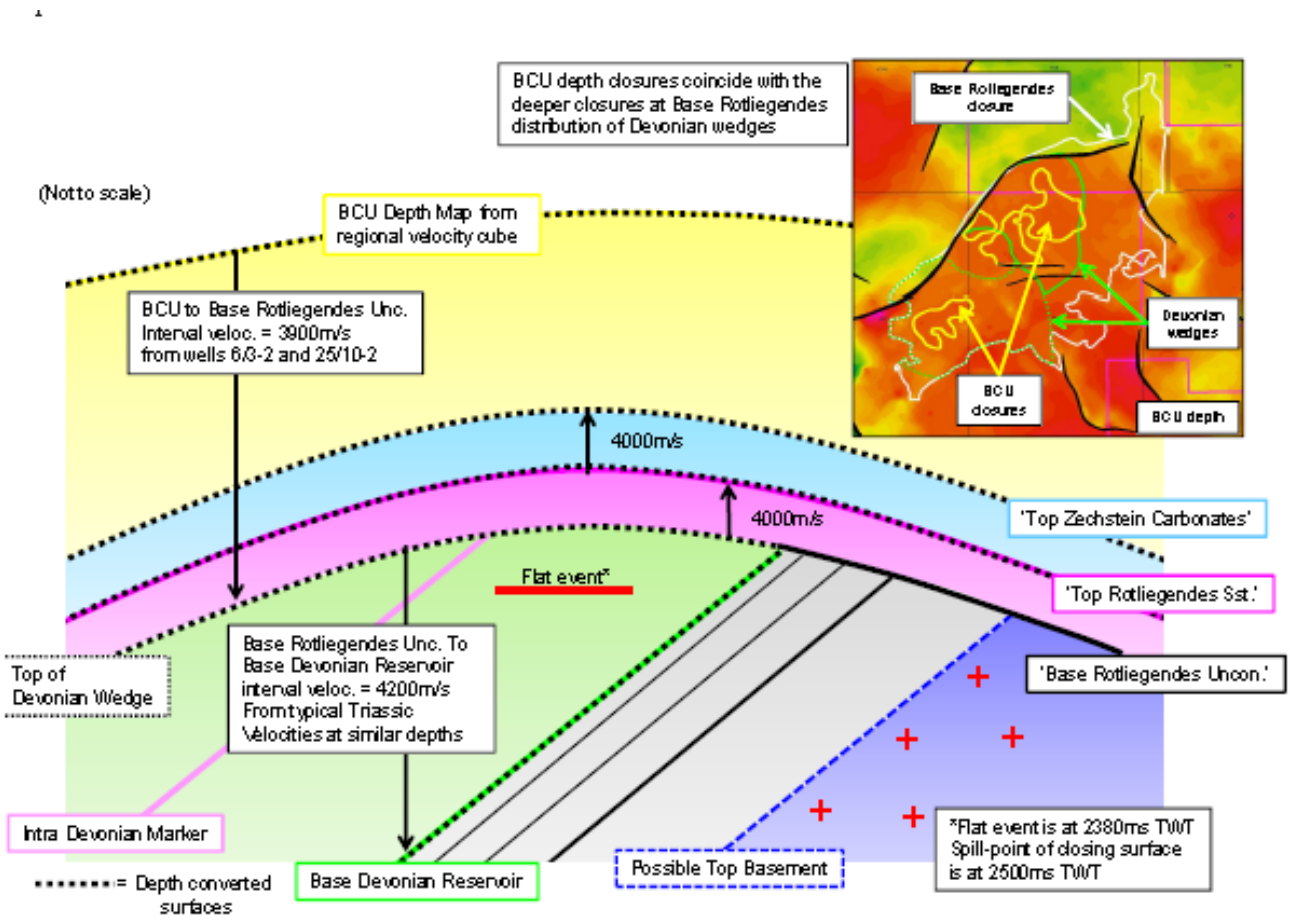


Figure 9 Schematic Cross-section through Valberget Prospect-illustrating the mapping and depth conversion

Block	Prospect name	Disc/Prosp/Lead	Prosp ID (or New!)	NPD approved?	
17/5,6,7,8 & 9	Valberget	Prospect			
Play (name / new)		Struct. element	Company reported by / Ref. Doc. / Year		
		Sele High	Slagen44, Edison, 4ess, Lotos / APA / 2008		
O/G. case	Resources INPLACE				
Oil	Main phase		Ass. phase		
	Low	Base	High	Low	Base	High
Oil 106 Sm3	50 (37)	536 (388)	1265 (917)	-	-	-
Gas 109 Sm3	-	-	-	-	-	-
	Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 106 Sm3	12 (8.7)	150 (109)	362 (263)	-	-	-
Gas 109 Sm3	-	-	-	-	-	-

Prob. discovery: -Technical (oil+gas case)		-Commercial prob. (oil+gas case)		-Prob for oil/gas case	
	0.10		-		-
Which fractiles are used as Low & High?				Low: P10	High: P90

Type of trap	Waterdepth (m)	Reservoir Chrono (from - to)	Reservoir Litho (from - to)
Structural / Truncation	90	Devonian	Old Red Group

SourceRock, Chrono	SourceRock, Litho	Seal, Chrono	Seal, Litho
Devonian, Carboniferous	Orcadian Fm. eqv. Carb. Coal	Permian, Triassic	Zechstein Gp., Smith Bank Fm.

Seismic database (2D/3D):	2D		
Probability			
- Reservoir (P1)	- Charge (P3)	- Trap (P2)	- Retention (P4)
0.54	0.70	0.30	0.90

Parametres:	Low	Base	High
Depth to top of prospect (m)	2500	2500	2500
Area of closure (km2)	32	120	127
Gross rock vol (109 Sm3)	1.1 (0.85)	9.3 (6.7)	43 (39)
HC column in prospect (m)	40	140	450
Reservoir thickness (m)	50	75	100
Net / Gross	0.10	0.25	0.60
Porosity (fraction)	0.10	0.17	0.25
Water Saturation	0.50	0.60	0.70
Bg. NB !(fraction)	-	-	-
1/Bo. NB !(fraction)	1 / 1.67	1 / 1.43	1 / 1.25
Recovery factor, main phase	0.15	0.30	0.40
Recovery factor, ass. phase	-	-	-
GOR, free gas (Sm3 /Sm3)	-	-	-
GOR, oil (Sm3 / Sm3)	20	40	80
Temperature, top res (deg C):	99	Pressure, top res (bar):	253

Table 2 Prospect data for the Valberget prospect (2008)

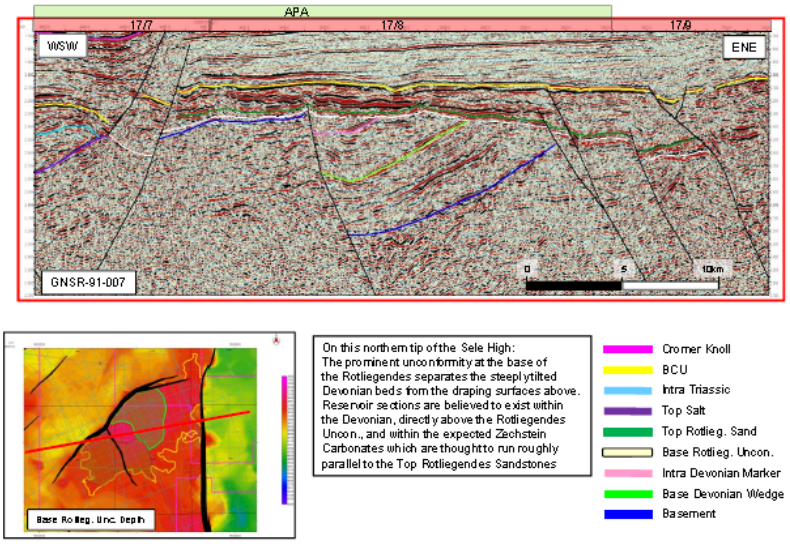


Figure 2.8 Line GNSR-91-007 illustrating the Interpretation Consept for the Vallberget Prospect.

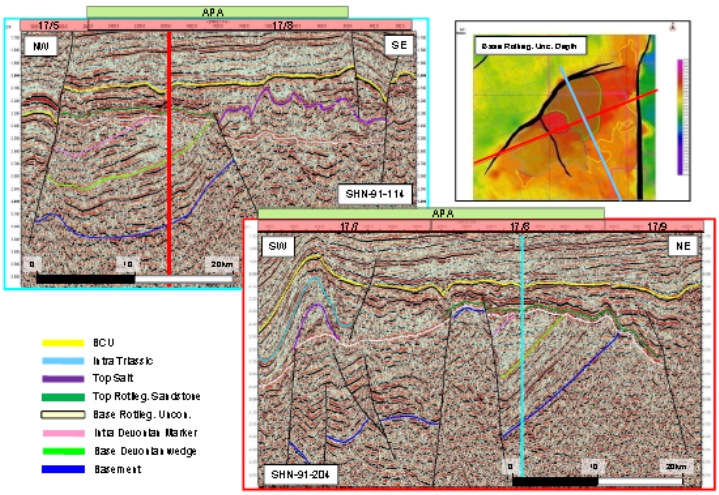


Figure 10 Seismic 2D lines through the Valberget prospect (2008)

Add-on application in APA2010

The Valberget prospect was the main prospect in PL503 and a substantial portion of it was outside the current license. The area applied for is situated north and east of PL503, covering the extension of the prospect into the open area (Figure 11). This area was relinquished after the APA2008 Round awards. The PL503 partners carried out an updated mapping, which confirmed the extent of the Valberget prospect. Furthermore, the license has performed a sea bed geochemical survey, which gave indications of the existence of a mature source rock including expulsion of hydrocarbons within the license area (Figure 12). The updated, basin modeling study also indicates potential for hydrocarbons within the Paleozoic succession, (gas is the more likely type of hydrocarbons according to the modelling study). It is estimated that 31% of prospective reserves is located out of the current PL503 license area. A prospect evaluation is presented in in Table 3.

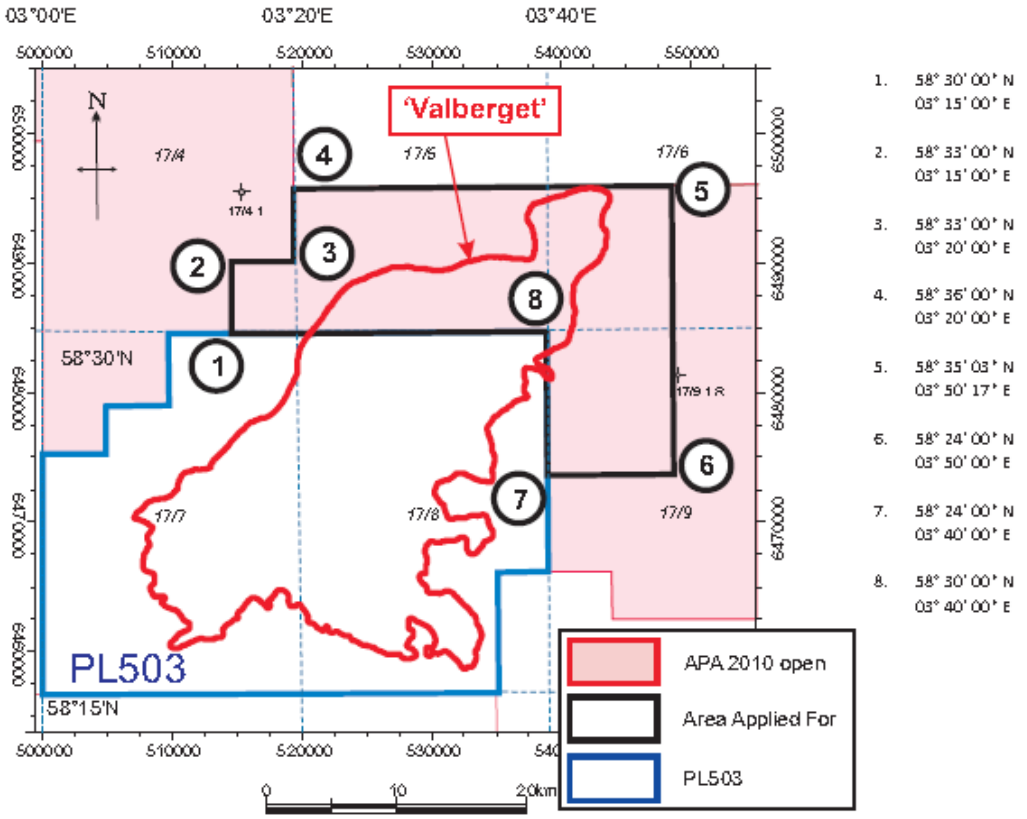


Fig. 1.1 Area Applied for with corner coordinates.

Table 1.2 Resource Potential - NPD Table 2. Note that numbers in brackets indicate volumes within APA area.

Discovery/ Prospect/ Lead name	D/ P/ L	Unrisked recoverable resources						Probability of discovery	Part in acreage applied for %	Reservoir		Distance to infra-structure (km)
		Oil $10^6 Sm^3$			Gas $10^9 Sm^3$					Litho-/ Chrono-stratigraphic level	Reservoir depth (m MSL)	
		Low	Base	High	Low	Base	High					
Valberget oil case	P	9.50 (3.8)	128.10 (30.7)	310.90 (96.4)				0.17	100	Sands/Devonian	2680	65

Figure 11 Add on area applied map and resource potential (2010)

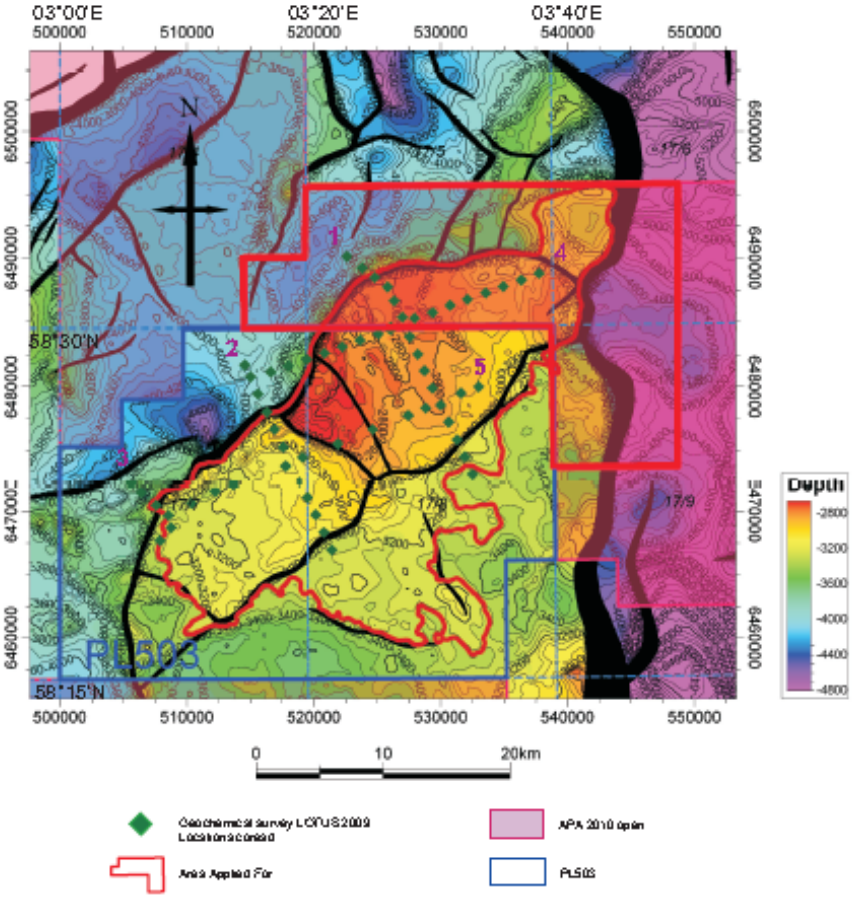


Fig. 2.2 Geochemical Survey. *Sample Locations on the Base Rotliegend Unconformity Depth Map*

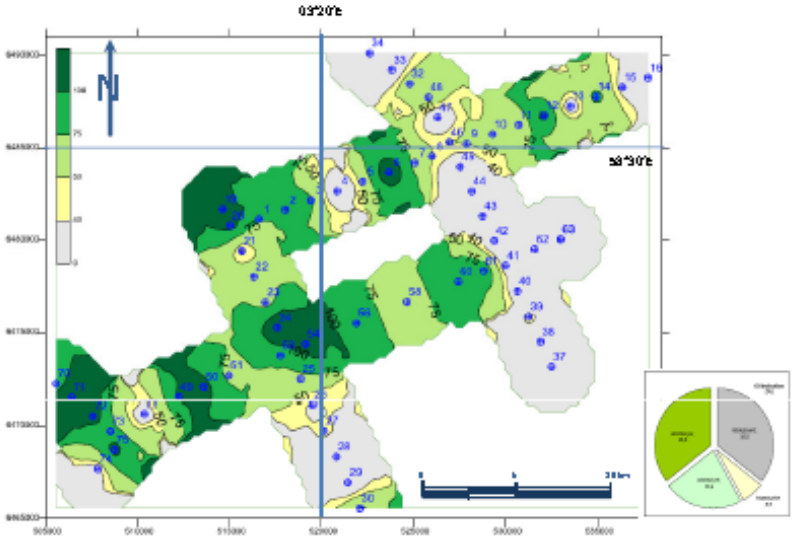


Fig. 2.3 Oil indicator map PL503.

Figure 12 Geochemical surveys on the Sele High

Table 2.4. Prospect data - NPD Table 4. Note that numbers in brackets indicate volumes within APA area.

Block	Prospect name		Discovery/Prosp/Lead		Prosp ID (or New?)	NPD approved?
17/4,5,6,9	Valberget		Prospect			
Play (name / new)	Structural element		Company/ reported by / Ref. doc.			Year
	SELE HIGH		Skagen44 AS, Edison International SpA Norway Branch, 4Sea Energy AS, LOTOS EPN AS/APA			2010
Oil/Gas case	Resources IN PLACE					
Oil	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	41 (16.4)	460 (110)	1123 (348)	–	–	–
Gas 10^9 Sm^3	–	–	–	–	–	–
	Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	9.5 (3.8)	128.1 (30.7)	310.9 (96.4)	–	–	–
Gas 10^9 Sm^3	–	–	–	–	–	–
	Which fractiles are used as:		Low:	P90	High:	P10
Type of trap	Water depth (m)		Reservoir Chrono (from - to)		Reservoir Litho (from - to)	
Structural/Truncation	90		Devonian		Old Red Group	
Source Rock, Chrono	Source Rock, Litho		Seal, Chrono		Seal, Litho	
Devonian/Carboniferous	Orcadian Fm eqv, Carb. Coal		Permian, Triassic		Zechstein GP, Smith Bank Fm	
Seismic database (2D/3D):	2D					
Probability of discovery:						
Technical (oil+gas case)	0.17		Prob for oil/gas case			70/30
Probability (fraction):	Reservoir (P1)	Trap (P2)	Charge (P3)	Retention (P4)		
	0.54	0.7	0.49	0.9		
Parametres:	Low	Base	High	Comments		
Depth to top of prospect (m)	2740	2630	2630			
Area of closure (km^2)	22 (9.7)	110 (34.7)	136 (39)			
Reservoir thickness (m)	50	75	100			
HC column in prospect (m)	50	230	450			
Gross rock vol. (10^9 m^3)	0.42 (0.21)	6.87 (1.63)	36.9 (10.4)			
Net / Gross (fraction)	0.1	0.25	0.6			
Porosity (fraction)	0.1	0.17	0.25			
Water Saturation (fraction)	0.5	0.4	0.3			
Bg. (<1)	–	–	–			
Bo. (>1)	1.67	1.43	1.25			
GOR, free gas (Sm^3 /Sm^3)	–	–	–			
GOR, oil (Sm^3 /Sm^3)	20	40	80			
Recovery factor, main phase	0.15	0.3	0.4			
Recovery factor, ass. phase	–	–	–			
Temperature, top res (deg C) :	99	Pressure, top res (bar) :		265		

For NPD use:

Innrapp. av geolog:		Registrert:		Map OK:		Nr:
Dato:		Dato:		Dato:		

Table 3 Prospect data for the Valberget prospect (2010)

Add on 2012 awarded 2013

The acquired 3D survey LO1101 improved the basis for defining prospects and petroleum systems on and around the Sele High. The data quality of the new survey is generally very good. The license performed a study of Low Frequency reflection attributes. The study was made on the merged survey LO1101. The result of the study clearly shows anomalies both in the PL 503, but also extending outside PL503 license. The most profound concentration of low frequent reflectivity is in the main Valberget and Sting area.
The Sting prospect, interpreted to be an Upper Rotliegendes Group sandstone reservoir, is located within area to the North – North East of the main license. This interpretation, together with the fact that the Sting prospect belongs to the same play as the "original" Valberget prospect, was the main reason to apply for add-on acreage in the open area to the north of PL503. The Sting prospect was therefore considered to be an add-on value to the existing Valberget prospect (Figure 12 and 13). The prospect evaluation of Sting is presented in Table 4.

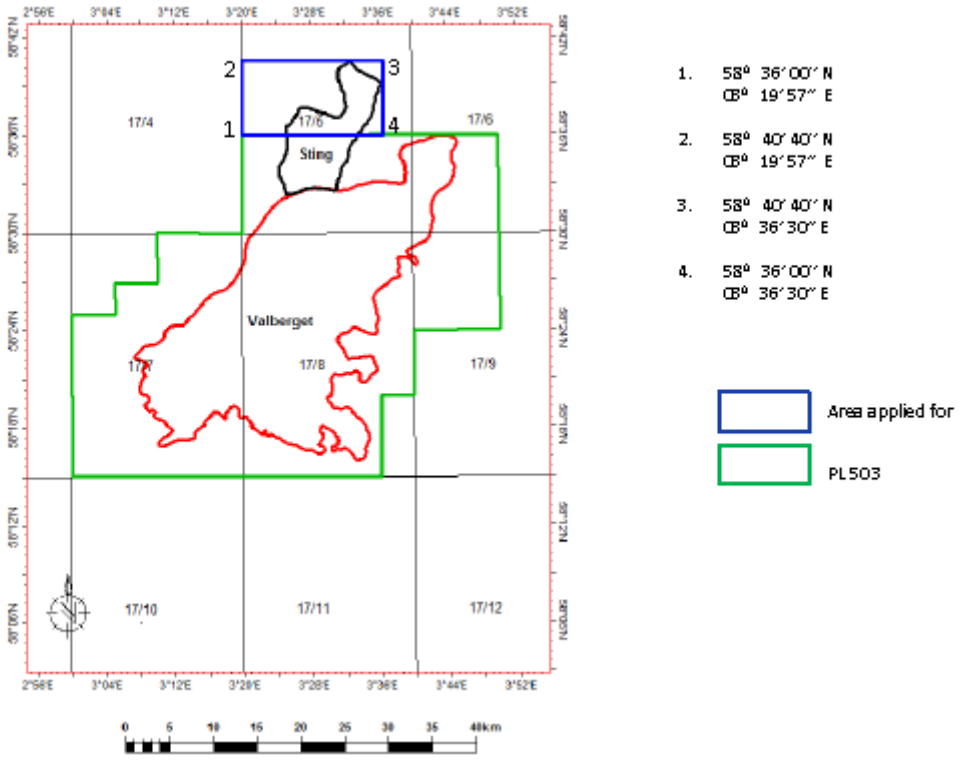


Figure 13 Second Add on Area applied with corner coordinates (2013)

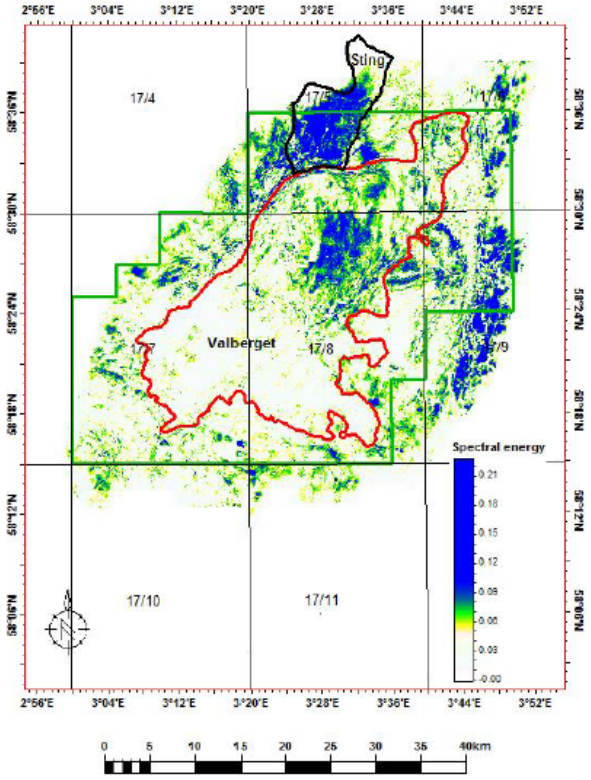


Figure 14 Second Add on Area applied with distribution of low frequency data in Rotliegendes sandstones.

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Table 5: Prospect data (Enclose map)

Block	17/5	Prospect name	Sting	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	LOTOS	Reference document				Assessment year	2014
This is case no.:	1 of 1	Structural element	Sele High	Type of trap	Structural/Stratigr	Water depth [m MSL] (>0)	90	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE Volumes, this case		**Main phase** Low (P90)	Base, Mode	Base, Mean	High (P10)	**Associated phase** Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm³] (>0.00)					3,90	10,20	12,90	24,30
	Gas [10^9 Sm³] (>0.00)	60,80	82,40	85,80	114,50				
Recoverable resources	Oil [10^6 Sm³] (>0.00)					2,08	5,35	6,68	13,10
	Gas [10^9 Sm³] (>0.00)	30,90	41,90	43,80	58,60				
Reservoir Chrono (from)	Upper Permian	Reservoir litho (from)	Rotliegendes GR	Source Rock, chrono primary	Upper Permian	Source Rock, litho primary	Kupferschiefer FM	Seal, Chrono	Lower Triassic
Reservoir Chrono (to)	Upper Permian	Reservoir litho (to)	Rotliegendes GR	Source Rock, chrono secondary	Upper Permian	Source Rock, litho secondary	Kupferschiefer FM	Seal, Litho	Zechstein GR
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0,11	Oil case (0.00-1.00)	0,10	Gas case (0.00-1.00)	0,90	Oil & Gas case (0.00-1.00)			
Reservoir (P1) (0.00-1.00)	0,59	Trap (P2) (0.00-1.00)	0,48	Charge (P3) (0.00-1.00)	0,40	Retention (P4) (0.00-1.00)	1,00		
Parametres:	Low (P90)	Base	High (P10)	*Comments: Trap fill is set to 50%-75%-100%*					
Depth to top of prospect [m MSL] (> 0)	3590	3600	3610						
Area of closure [km²] (> 0.0)	76,0	84,0	87,0						
Reservoir thickness [m] (> 0)									
HC column in prospect [m] (> 0)	500	540	560						
Gross rock vol. [10^9 m³] (> 0.000)	8,400	8,900	9,300						
Net / Gross [fraction] (0.00-1.00)	0,45	0,51	0,58						
Porosity [fraction] (0.00-1.00)	0,13	0,14	0,15						
Permeability [mD] (> 0.0)	10,0	50,0	100,0						
Water Saturation [fraction] (0.00-1.00)	0,28	0,30	0,35						
Bg [Rm3/Sm3] (< 1.0000)	0,0027	0,0029	0,0032						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm³/Sm³] (> 0)									
GOR, oil [Sm³/Sm³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0,45	0,50	0,60						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)				For NPD use:					
Temperature, top res [°C] (>0)	130			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	460			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

Table 4 Prospect data for the Sting prospect

Post award interpretation using 3D seismic data:

The three most profound prospects, defined after 3D seismic interpretations are; the main Barlind prospect with the Paleozoic secondary prospect and the Sting prospect. The main risk for all prospects is the source and migration, whereas reservoir, seal and retention is generally regarded lower risk.

The Sting Prospect

The Sting prospect was awarded in the APA 2013 based on the Add On application. The target was the Rotliegendes reservoir. The main definition of the prospect was based on low frequency reflection attributes generated from the L01101 3D seismic survey. The high level of low frequent reflectivity is concentrated in the main Valberget prospect, but extends to the northwest into open areas. The Sting prospect has an Upper Rotliegendes Group sandstone reservoir. The dry Lupin well (16/8-3S) reduced the probability of discovery in the prospect below 10%.

The Initial Vaberget Paleozoic Prospect / The new secondary prospect in Paleozoic

The big Valberget closure was defined in the application in 2008 and extended in 2010 based on 2D seismic data. The interpretation of the new 3D in 2011 gave a better image of the fault geometry and stratigraphy on the Sele High. The faults definition was improved and the possible ADI described in Devonian/Carbon level on 2D seismic was no longer observed. However, multiples are identified in the section on the new 3D data. The 4-way closure from the 2008 application at Permian and Carboniferous /Devonian level are considerable reduced in size on the new 3D seismic.

The outlines of the Permian and the Carboniferous/Devonian four way closure are shown in the following figure 15 and 16. The prospect evaluation of the two levels are presented in Table 5 and 6. The result of Well 16/8-3 S, the Lupin prospect southwest of the Sele High, with primary target in Rotliegendes sandstones, was dry with poor reservoir quality.

Our main focus after this well was the Jurassic section.

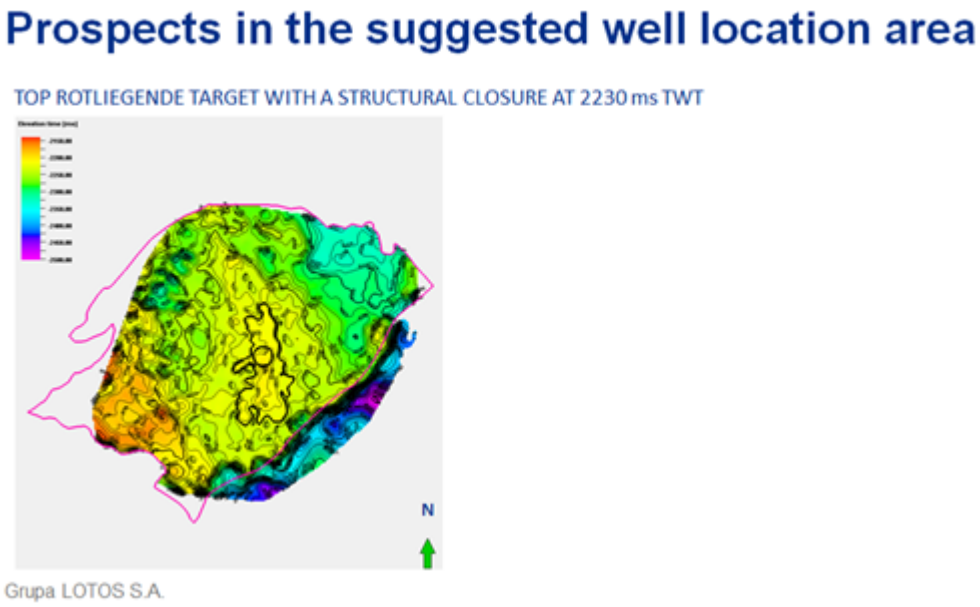

Figure 15 Top Rotliegendes depth map with polygon showing the 4 way closure.

Table 5: Prospect data (Enclose map)

Block	17/8	Prospect name	Rotliegendes Cantr	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	LOTOS	Reference document				Assessment year	2015
This is case no.:		Structural element	Sele High	Type of trap	Structural/Stratigr	Water depth [m MSL] (>0)	90	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm^3] (>0.00)					0,34	0,98	1,10	2,04
	Gas [10^9 Sm^3] (>0.00)	2,65	6,24	6,96	12,58				
Recoverable resources	Oil [10^6 Sm^3] (>0.00)					0,20	0,60	0,66	1,22
	Gas [10^9 Sm^3] (>0.00)	1,56	3,85	4,18	7,49				
Reservoir Chrono (from)	Early Permian	Reservoir litho (from)	Rotliegendes	Source Rock, chrono primary	Late Permian	Source Rock, litho primary	Kupferschifer	Seal, Chrono	Late Permian
Reservoir Chrono (to)	Late Permian	Reservoir litho (to)	Rotliegendes	Source Rock, chrono secondary	Early Carbonifero	Source Rock, litho secondary	Mississipian coal	Seal, Litho	Kupferschifer
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0,09	Oil case (0.00-1.00)	0,10	Gas case (0.00-1.00)	0,90	Oil & Gas case (0.00-1.00)	0,00		
Reservoir (P1) (0.00-1.00)	0,30	Trap (P2) (0.00-1.00)	0,80	Charge (P3) (0.00-1.00)	0,40	Retention (P4) (0.00-1.00)	1,00		
Parametres:	Low (P90)	Base	High (P10)	*Trap fill is set to 1% - 50% - 99%*					
Depth to top of prospect [m MSL] (> 0)	2660	2660	2660						
Area of closure [km^2] (> 0.0)	12,0	12,0	12,0						
Reservoir thickness [m] (> 0)	20	20	20						
HC column in prospect [m] (> 0)	70	70	70						
Gross rock vol. [10^9 m^3] (> 0.000)	0,375	0,986	2,303						
Net / Gross [fraction] (0.00-1.00)	0,45	0,51	0,58						
Porosity [fraction] (0.00-1.00)	0,13	0,14	0,15						
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)	0,45	0,40	0,35						
Bg [Rm3/Sm3] (< 1.0000)	0,0032	0,0034	0,0036						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0,55	0,60	0,65						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0,55	0,60	0,65	For NPD use:					
Temperature, top res [°C] (>0)	106			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	266			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

Table 5 Prospect data for the Permian secondary prospect

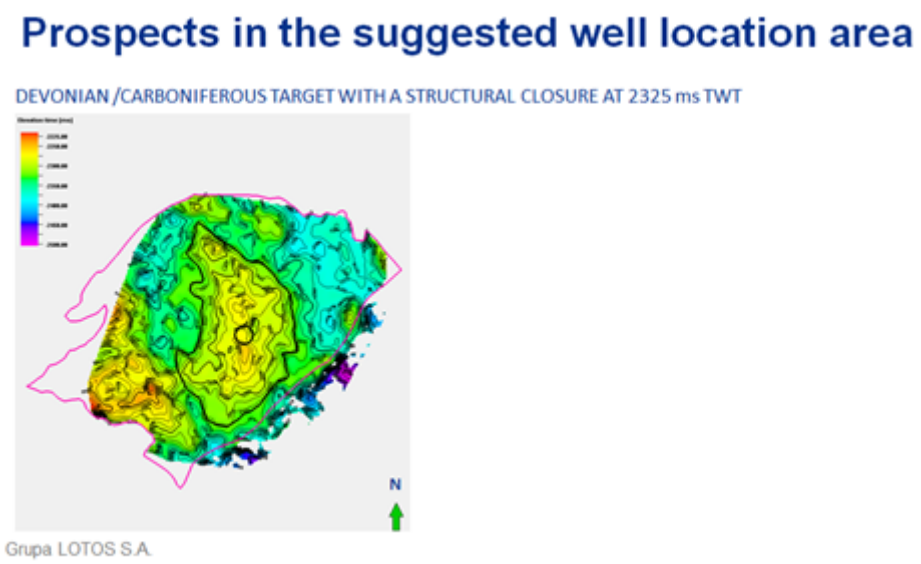

Figure 16 Top Carboniferous depth map with polygon showing the 4 way closure.

Carboniferous/Devon reservoir parameters

Table 5: Prospect data (Enclose map)

Block		Prospect name	Carboniferous pros	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Oil	Reported by company	LOTOS	Reference document				Assessment year	2015
This is case no.:	1 of 1	Structural element	Sele High	Type of trap	Structural/Stratigr	Water depth [m MSL] (>0)	90	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm^3] (>0.00)					0,41	1,33	1,52	2,94
	Gas [10^9 Sm^3] (>0.00)	1,74	5,41	6,10	11,40				
Recoverable resources	Oil [10^6 Sm^3] (>0.00)					0,17	0,55	0,64	1,22
	Gas [10^9 Sm^3] (>0.00)	0,86	2,67	3,08	6,24				
Reservoir Chrono (from)	Carboniferous	Reservoir litho (from)	Pensylvanian ss.	Source Rock, chrono primary	Carboniferous	Source Rock, litho primary	Mississipian coal	Seal, Chrono	Carboniferous
Reservoir Chrono (to)	Devonian	Reservoir litho (to)	Mississipian ss.	Source Rock, chrono secondary	Devonian	Source Rock, litho secondary	Devonian shales	Seal, Litho	Pensylvanian shales
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0,08	Oil case (0.00-1.00)	0,10	Gas case (0.00-1.00)	0,90	Oil & Gas case (0.00-1.00)	0,00		
Reservoir (P1) (0.00-1.00)	0,25	Trap (P2) (0.00-1.00)	0,80	Charge (P3) (0.00-1.00)	0,40	Retention (P4) (0.00-1.00)	1,00		
Parametres:	Low (P90)	Base	High (P10)	*Trap fill is set to 1% - 50% - 99%*					
Depth to top of prospect [m MSL] (> 0)	2800	2800	2800						
Area of closure [km^2] (> 0.0)									
Reservoir thickness [m] (> 0)									
HC column in prospect [m] (> 0)									
Gross rock vol. [10^9 m^3] (> 0.000)	0,290	0,792	1,693						
Net / Gross [fraction] (0.00-1.00)	0,35	0,41	0,50						
Porosity [fraction] (0.00-1.00)	0,12	0,15	0,18						
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)	0,45	0,40	0,35						
Bg [Rm3/Sm3] (< 1.0000)	0,0032	0,0034	0,0036						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0,40	0,50	0,60						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0,35	0,41	0,50	For NPD use:					
Temperature, top res [°C] (>0)	112			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	280			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

Table 6 Prospect data for the Carboniferous/Devonian secondary prospect

Barlind Upper Middle Jurassic Prospect

The Barlind prospect is defined as a combined structural and stratigraphic trap of Upper Middle Jurassic Prospect age, interpreted to be an equivalent to the shallow marine Sandnes Formation. (Figure17). The Barlind prospect reservoir is interpreted to be deposited as part of a shallow marine tidal environment, locally sourced from salt induced uplifted Triassic sediments on the Sele High to the east (Figure18) Transgression onto the Sele High drowned these shallow marine deposits and a more deep marine sequence was deposited. The Jurassic Barlind prospect is the main prospect on the Sele High with a probability of discovery of 20%, and is situated in the central area of the Sele High closure. The prospect evaluation of the Barlind prospect is presented in Table 7.

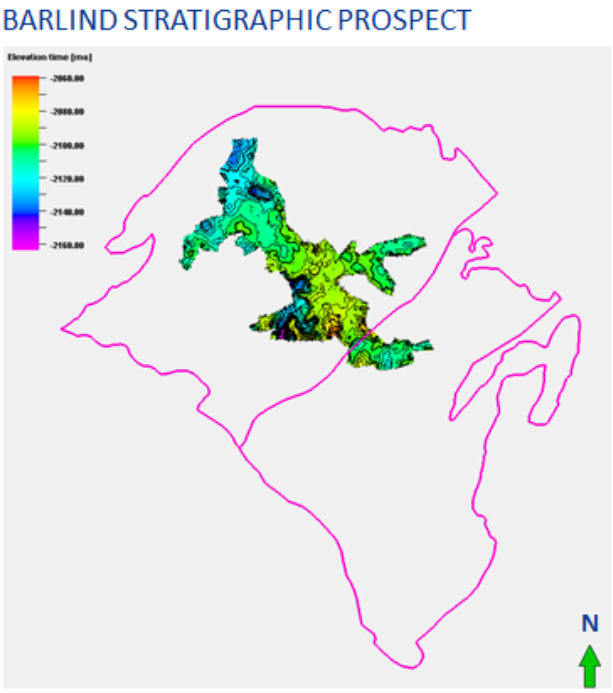

Figure 17 Outlines of the Barlind prospect.

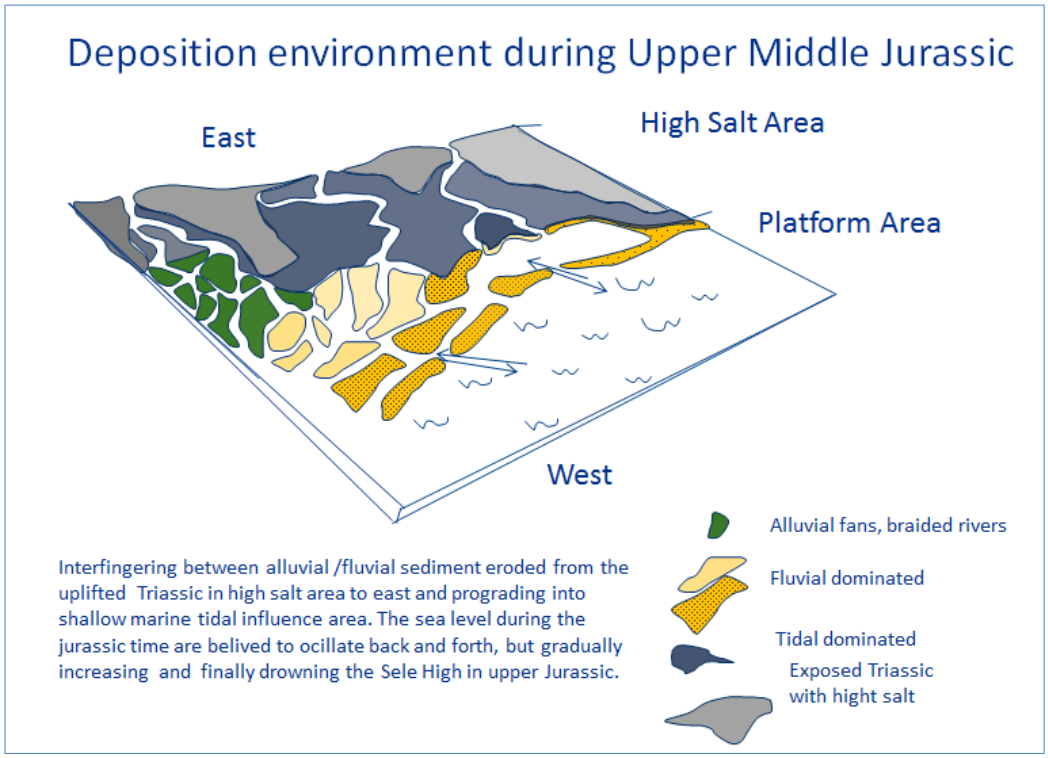

Figure 18 Deposition environments during Upper Middle Jurassic time

Table 5: Prospect data (Enclose map)

Block	17/8	Prospect name	Barlind New	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Oil	Reported by company	Lotos	Reference document				Assessment year	2015
This is case no.:		Structural element	Sele High	Type of trap	Structural/Stratigr	Water depth [m MSL] (>0)	90	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm^3] (>0.00)	31,00	59,50	59,50	87,00				
	Gas [10^9 Sm^3] (>0.00)					1,32	2,42	2,47	3,66
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	12,60	23,30	23,80	34,90				
	Gas [10^9 Sm^3] (>0.00)					0,54	0,97	0,99	1,49
Reservoir Chrono (from)	Callovian	Reservoir litho (from)	Sandnes Fm.	Source Rock, chrono primary	Kimmeridgian	Source Rock, litho primary	Tau Fm.	Seal, Chrono	Kimmeridgian
Reservoir Chrono (to)	Bathonian	Reservoir litho (to)	Bryne Fm.	Source Rock, chrono secondary	Bathonian	Source Rock, litho secondary	Bryne Fm.	Seal, Litho	Tau Fm.
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0,20	Oil case (0.00-1.00)	0,90	Gas case (0.00-1.00)	0,10	Oil & Gas case (0.00-1.00)	0,00		
Reservoir (P1) (0.00-1.00)	0,72	Trap (P2) (0.00-1.00)	0,70	Charge (P3) (0.00-1.00)	0,40	Retention (P4) (0.00-1.00)	1,00		
Parametres:	Low (P90)	Base	High (P10)	*Trap fill has been set to 1% - 65% - 99% in the Geox calculations*					
Depth to top of prospect [m MSL] (> 0)	2428	2428	2428						
Area of closure [km^2] (> 0.0)	40,0	50,0	60,0						
Reservoir thickness [m] (> 0)	40	40	40						
HC column in prospect [m] (> 0)	40	40	40						
Gross rock vol. [10^9 m^3] (> 0.000)	1,590	1,987	2,365						
Net / Gross [fraction] (0.00-1.00)	0,40	0,60	0,75						
Porosity [fraction] (0.00-1.00)	0,18	0,24	0,26						
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)	0,35	0,45	0,55						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0,72	0,69	0,67						
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)	36	44	52						
Recov. factor, oil main phase [fraction] (0.00-1.00)	0,32	0,40	0,50						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0,32	0,40	0,50						
Recov. factor, gas main phase [fraction] (0.00-1.00)									
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)				For NPD use:					
Temperature, top res [°C] (>0)	96			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	240			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

Table 7 Prospect data for the Barlind prospect

Enhanced understanding post award:

Enhanced knowledge through the technical work of the structural, sedimentological and depositional and stratigraphic parts; has led to the definition of the Barlind prospect. The 3D seismic data has matured the interpretation compared to the 2D seismic lines used during the pre award studies. The Barlind prospect was not defined in the early APA application from 2008. More semi-regional understanding has been gained through the technical work performed and through information from more wells in the wider area (among others the Johan Sverdrup wells).

Nevertheless, the main risk/uncertainty is still the source and migration. Thus, the most significant study for the understanding and risking of PL503 area prospects has been the basin modeling and the source and migration studies. These studies conclude that the Jurassic source rocks in the Sleipner Terrace might be the source to the Sele High through long distance migration in the Ling Graben. The Stord Basin to the north may be another possible source area, but so far this play fairway model is not proven. Migration from the Egersund basing is a proven concept in this area, as being source to the Markell, Vette and Yme, however the current understanding is that the source from Egersund Basin kitchen is limited, and the prospects in the Egesund basin are all under filled, indicating limited migration distance. A sourcing from Paleozoic sequence is a possibility, but not yet proven.

This leaves the Sele High with a lot of possibilities but with a significant risk. Recent dry wells in the region and extensive basin modelling work support this view (unproven source, complex migration route, likely under-filled).

5. Technical evaluations

The operator proposed a well on the Sele High with Barlind prospect as the primary target and the Permian and Carboniferous / Devonian as secondary targets. From the mapping and evaluation the well location shown in figure 19, is in an optimal position for all three targets.

Based on a discovery with a size of the mean volume, this prospect is from an engineering and technical economic evaluations point of view, a robust prospect with a break-even oil price of 45 USD/bbl (at the time). The project is considered as a high risk/high reward project internally. The technical documentation supporting this work is outlined below in Figure 20. The partners in the license did not support LEPN recommendation to drill the well.

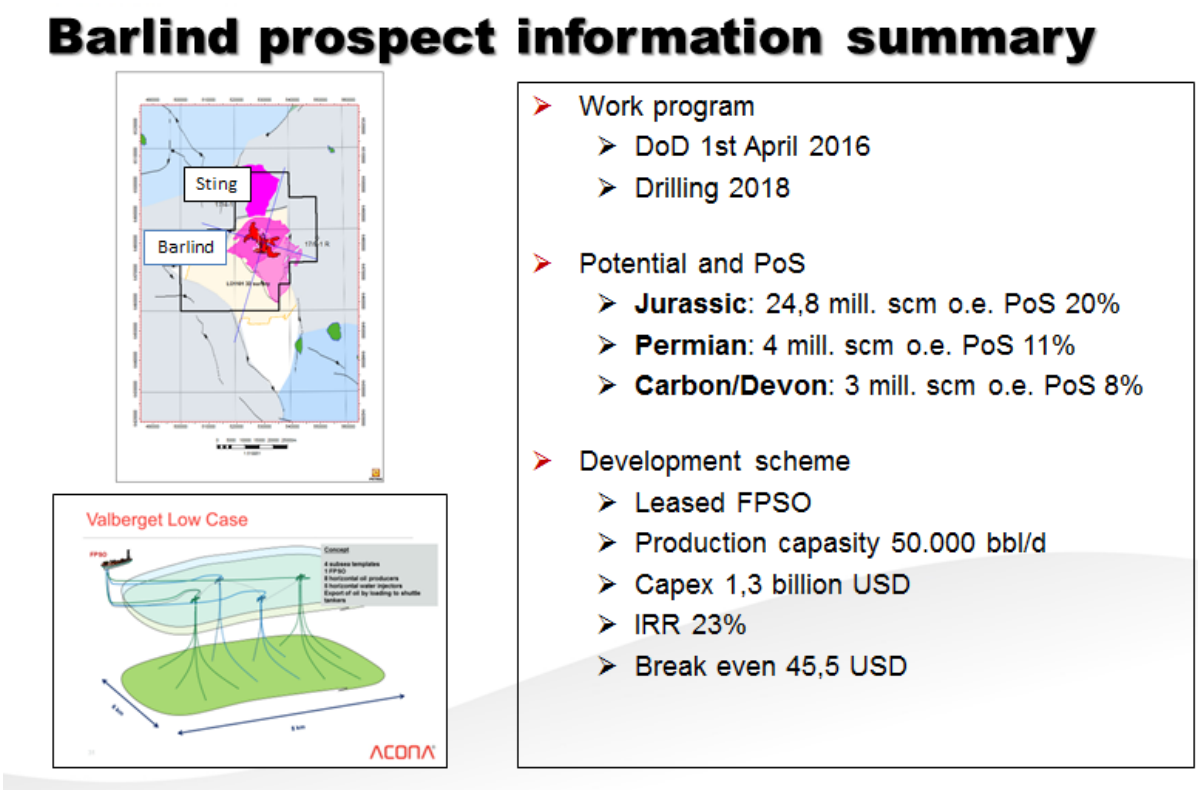

Figure 19 Information summary of the Barlind Prospect.

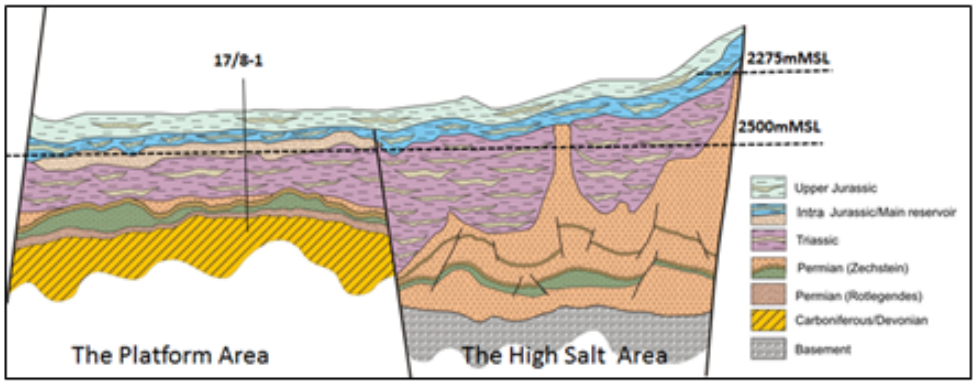

Figure 20 Position of the proposed well

6. Conclusions

The prospectively on the Sele High is attractive to LEPN. With the new 3D survey geometries, faults and events are better defined. Several prospect levels have been evaluated and mapped. The lack of well information on the Sele High reduces the quality for evaluation tools such as AVO and other ADI evaluations. The probability for a success is 20% -and considered as a high risk project. The size of the prospect and the fact that PL503 is situated in an analogue to the Sverdrup Field on the Utsira High is encouraging. The structural development and the deposition environment in these two areas have a lot in common. Source and migration have been identified as the key risk within the area. The prospect risk remains high but the project economics are good.

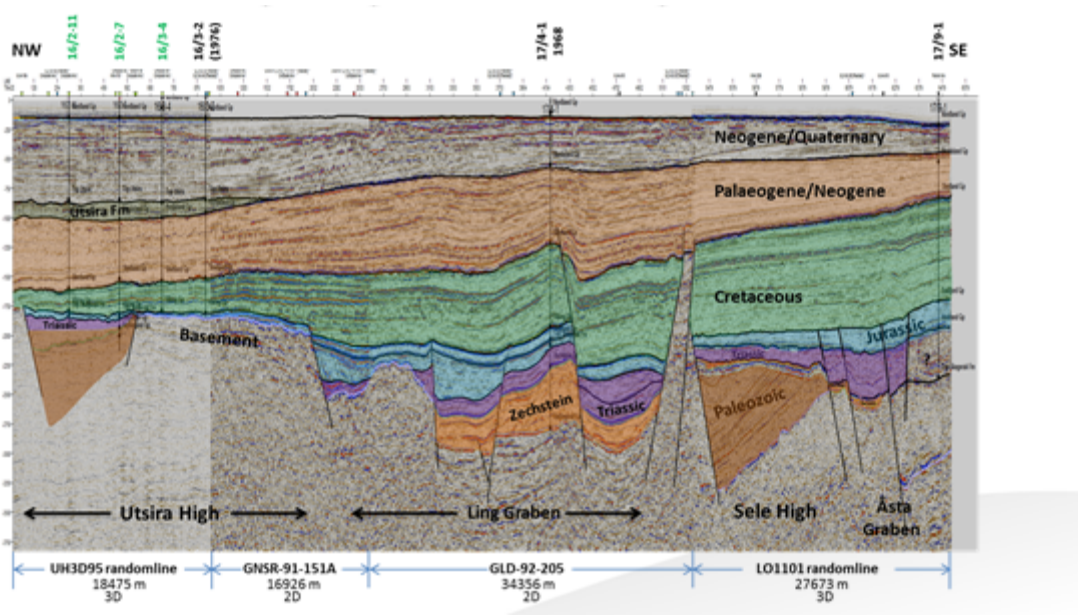

Figure 21 Seismic correlations from the Utsira High, Sverdrup Field into the Sele High.