Relinquishment Report

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1 Summary of license history

The PL 391 licence block 6506/1, was awarded in the 19th licensing round, April 28th 2006, to BG Norge as operator (40%), with Idemitsu (20%) , Hess (20%) and Noreco (20%) as partners. The initial work program was to acquire minimum 400km² of 3D seismic data, and by April 28th 2009 decide to drill or drop the licence.

The seismic commitment was achieved by the acquisition of the BG07m01 3D seismic dataset

The voting rules in the PL391 licence were majority by three companies and minimum 50%.

The licence applied for one extension of the Drill or Drop decision:

- April 3rd 2009 MPE accepted the licence's application of a 9 month extension of the Drill or Drop. The new Drill or Drop date is Jaunary 28th 2010.

The PL391 has been collaborating with BG Norge operated PL382 and PL390 licences regarding the regional geology and geophysical work.

The main prospective level identified is the Lysing Fm. Secondary play models which have beeen evaluated, are the Eocene/Paleocene play and Nise Fm. play (Fig. 1.1).

- Reservoirs
  - Main
    - Lysing Fm
  - Secondary
    - Eocene/Paleocene
    - Nise Fm
    - Lange
- Seals
  - Kvitnos Fm
  - Late Cretaceous and Tertiary shales
- Source rocks
  - Spekk Fm
  - Lange Fm

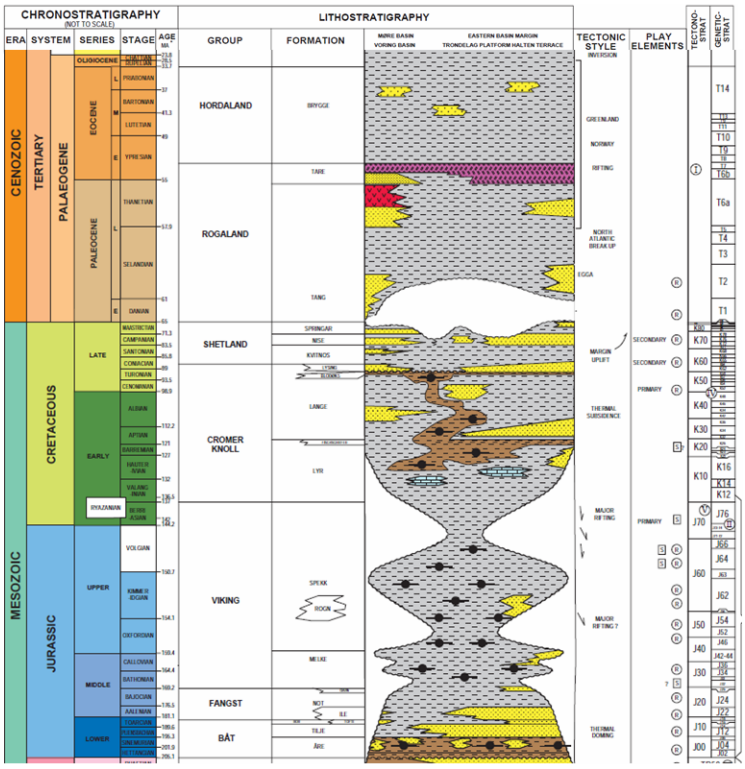


Fig. 1.1 Stratigraphy. Evaluated Plays: Lysing Fm. play Nise Fm. play and Eocene/Paleocene Play

In the the 19th round application three Lysing Fm. leads were identified, the Gresskar lead being the largest (Fig. 1.2 and Fig. 1.3). Five leads were identified on the new BG07m01 3D seismic dataset, Lysing North and Lysing South (Fig. 1.4) and three Nise leads (Fig. 1.5). The main uncetainties of the leads are:

Lysing N and S leads

- Moderate to high risk on effective reservoir
  - No seismic amplitudes or AVO anomalies supporting high quality reservoir with HC accumulations
- High risk on trap
  - Fault seal dependant traps
- High to moderate risk on source
  - Spekk Fm. overmature at the time of trap formation
  - Cretaceous source rock not properly proven

Nise Fm. leads

- High risk on presence of reservoir
  - No seismic indications of Nise Fm. sandstones
  - Neighbouring wells have not penetrated Nise Fm. sandstones
- High to moderate risk on source
  - Spekk Fm. overmature at the time of trap formation
  - Cretaceous source rock not properly proven

Figure Fig. 1.2 and Fig. 1.3 show the identified leads in the 19th licensing round application. Figures Fig. 1.4 and Fig. 1.5 the show the identified leads based on the new 3D seismic data

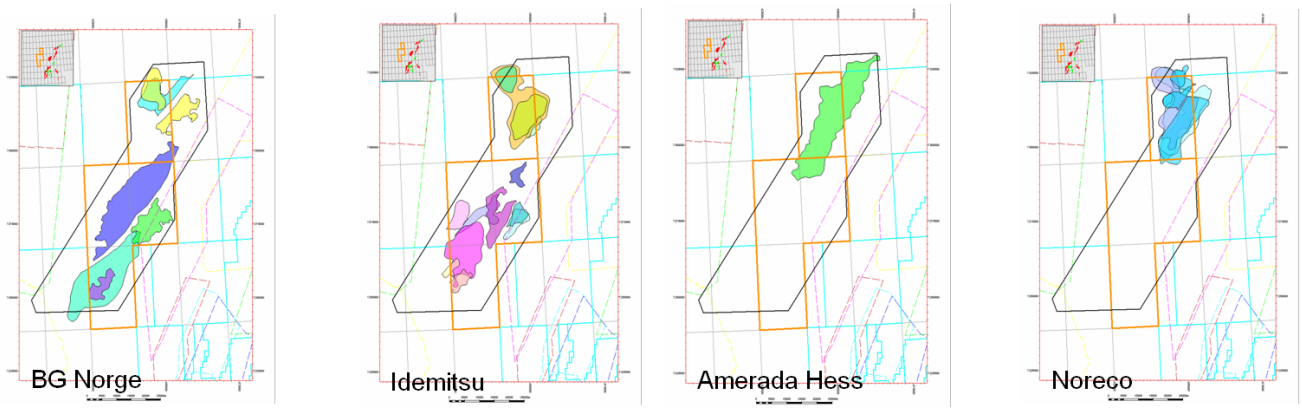
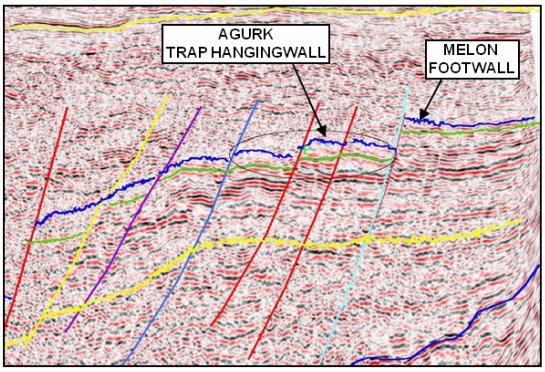


Fig. 1.2 Defined leads in the 19th licencing round application

- Multi prospects & leads
- 2D only at present
- WP: 400+1200 sq km 3D with DoD in two licenses
- Suggest approximately 2250 sq km 3D



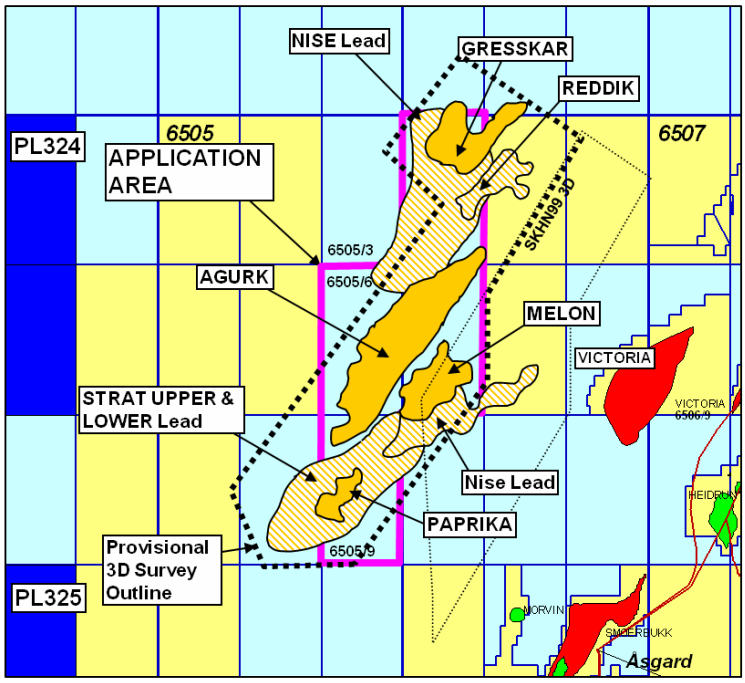


Fig. 1.3 19th round application summary

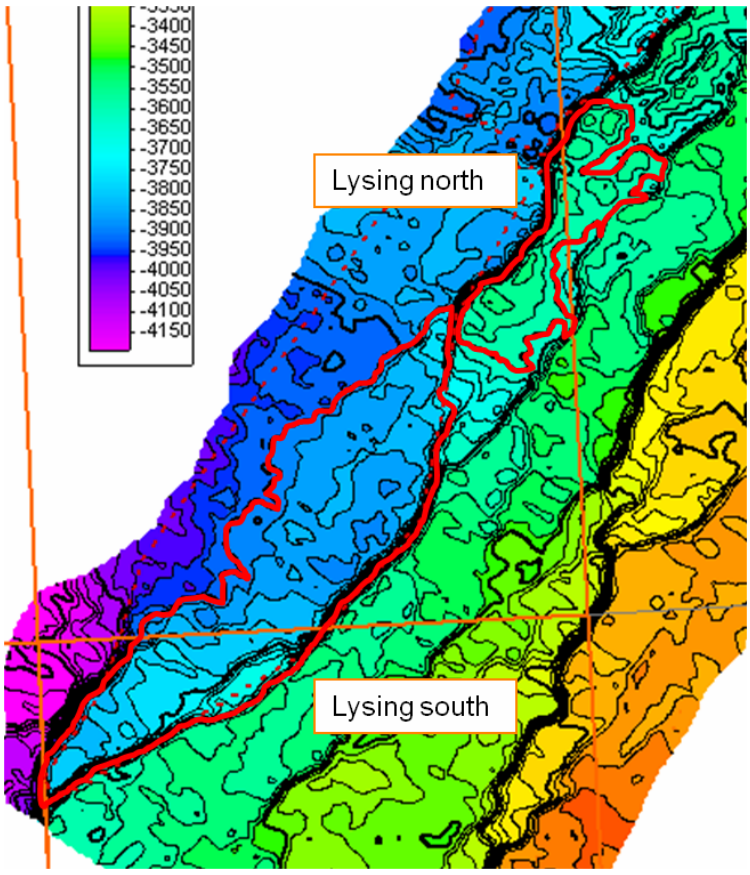


Fig. 1.4 Structural depth map Lysing Fm.. Outline of the Lysing N and Lysing South leads.

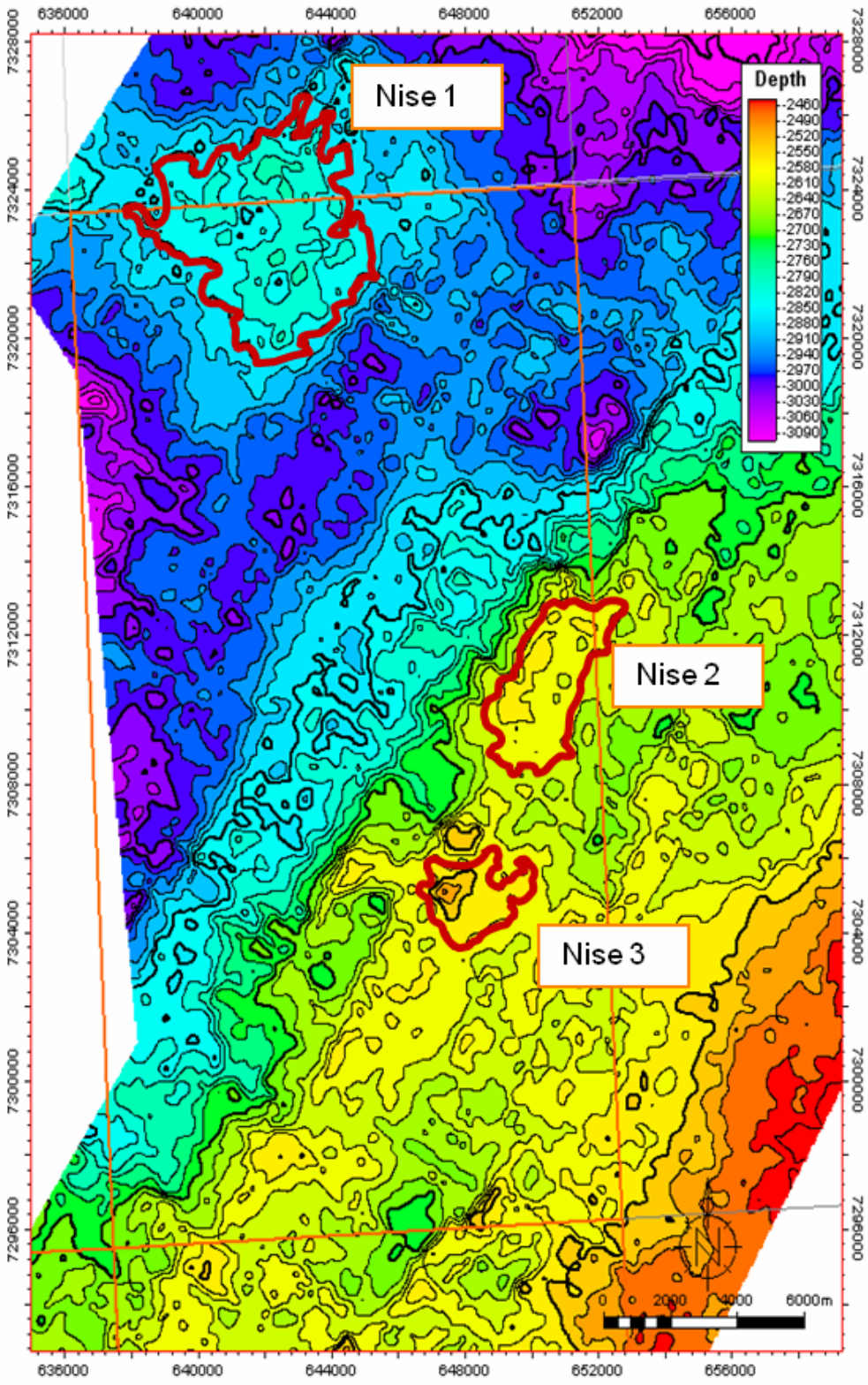


***Fig. 1.5 Structural depth map Nise Fm.**. Outline of the Nise fm. leads*

The resource potential and associated chance of sucess for the Lysing Fm. leads and Nise Fm. leads are listed in Fig. 1.6, Fig. 1.7 and Fig. 1.8.

	Risk	In Place GSm³			Recoverable GSm³		
		P90	Mean	P10	P90	Mean	P10
Lysing N	0.12	0.3	1.3	2.6	0.2	0.8	1.4
Lysing S	0.07	0.4	1.3	6.2	0.2	0.8	3.5
Nise 1	0.04	0.5	2.9	6.3	0.4	1.4	4.3
Nise 2	0.025	0.8	1.8	3.2	0.5	1.3	2.2
Nise 3	0.025	0.1	0.4	0.8	0.1	0.2	0.6

Fig. 1.6 Volumes and risk for the Lysing and Nise leads

	Lysing S	Lysing N	
Risk Element	COS	COS	Comments
Tp	0.40	0.70	Tp is a fundamental issue for South which is highly dependant on fault seal. North is a small 4-way dip closure with low relief
Te	0.80	0.8	Based on the basin modelling study results and knowledge from the Kvitnos shale we are optimistic.
Sp	1.0	1.0	HC source is assumed proven with Spekk Fm. and Cretaceous source rocks
Se	0.8	0.8	If source is present, we are optimistic that it will generate HC to the traps based on the modelling study
Rp	0.65	0.65	Incline to optimism. Support from wlls, seismic and depositional models for the area. However 6506/3-1 well result is not positive
Re	0.4	0.4	If reservoir is present, we are inclined to pessimism for the quality. It will be more silty than wells in the east and the depth of burial will reduce the quality
COS	**0.07**	**0.12**	

Fig. 1.7 Chance of success for the Lysing Fm. leads

	Nise 1	Nise 2	Nise 3	
Risk Element	COS	COS	COS	Comments
Tp	1.0	0.6	0.6	We are certain or inclined to optimism on the existence of traps. However, the seismic imaging is poor and two of the leads have low relief
Te	0.4	0.4	0.4	Trap formation very late and top seal capacity not present when Spekk Fm. has maximum expulsion
Sp	1.0	1.0	1.0	HC source is assumed proven with Spekk Fm. and Cretaceous source rocks
Se	0.45	0.45	0.45	We are inclined to pessimism. Kvitnos shales might be sealing and prevent vertical migration from older source rocks. Lysing Fm. will act as a horizontal migration path towards east.
Rp	0.3	0.3	0.3	Pessimism. No support for reservoir in offset wells, structural restoration and seismic and inversion data
Re	0.8	0.8	0.8	If reservoir is present, we are poptimistic that it should be of sufficient quality even if it may be distal
COS	**0.04**	**0.025**	**0.025**	

Fig. 1.8 Chanceof success for the Nise Fm. leads

The PL391 licence recommended to drop the license based on:

- Limited resource potential with low chance of sucess.
- No new relevant geological or geophysical data are known to be aquired in the near future that can bring adequte information to the licence area.
- No wells are known to be drilled in near future that can bring new knowledge to the licence area.

2 Database

Seismic Database
All released 2D seismic data and the 3D BG07m01 are in the common database.

The BG07m01 3D survey was acquired during the summer of 2007 and 2008. The acquisition was done in collaboration with the PL390 and PL382 licences. BG hosted a meeting with all partners in PL382, PL390 and PL391 and agreed upon a common strategy for acquiring and processing the BG07m01 and BG0801 3D seismic including streamer towing depth, streamer separation and and time window targets for processing.

Totally aquired 3D seismic in the licence is 850 km^2 including the surveys BG0701 and BG0803 (Fig. 2.1)

Geotrace was chosen as the processing contracter for the entire BG07m01 3D seismic (PL390 and PL391). A PTSM processing sequence was chosen, see Fig. 2.2 for further details

Table 2.1 lists the available data in Petrobank.

Well database
All released wells are in the common database.

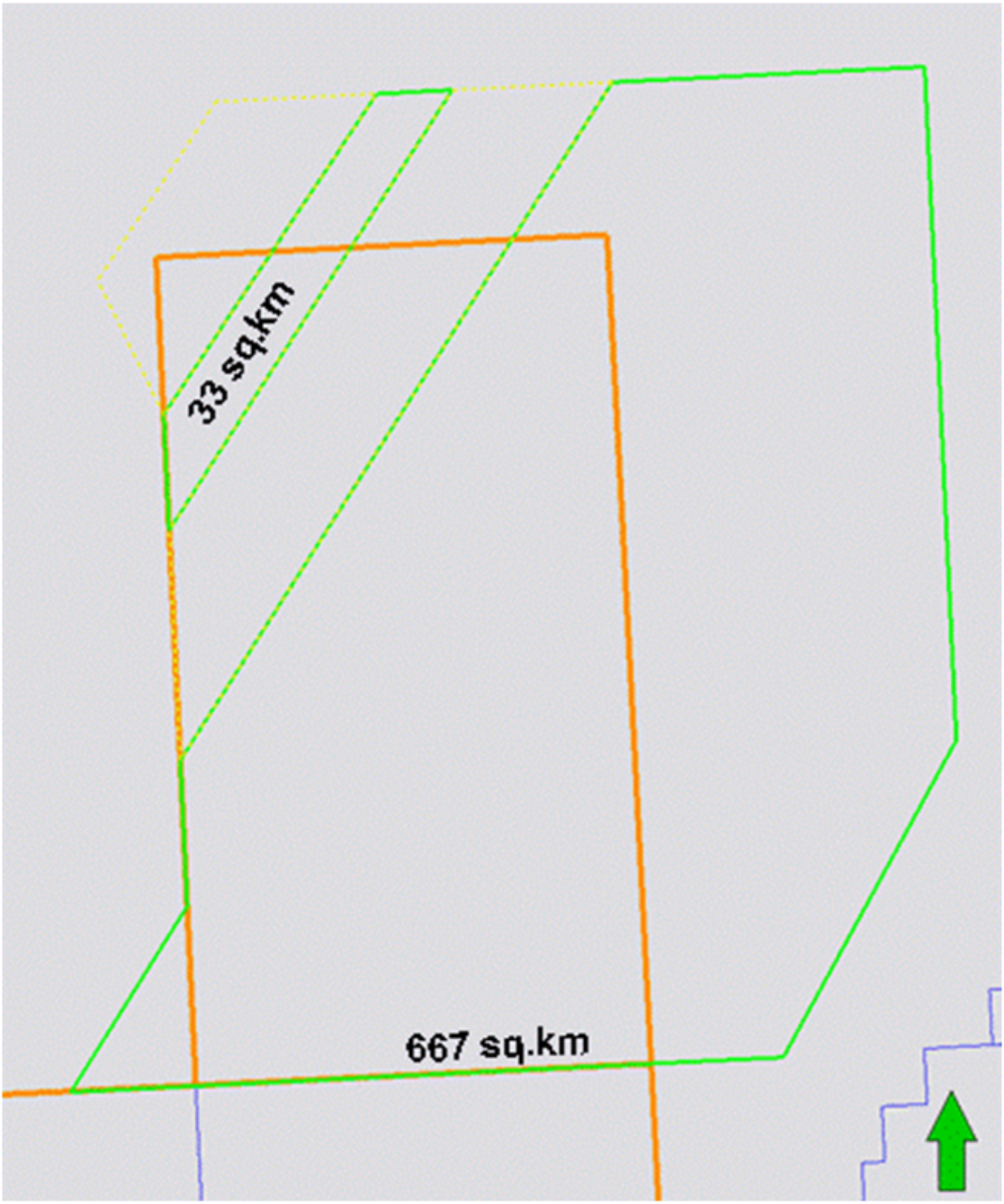


Fig. 2.1 BG07m01*. Green outline: 2007 aquisition. Yellow outline: 2008 aqusition. Orange outline: PL 391 acreage*

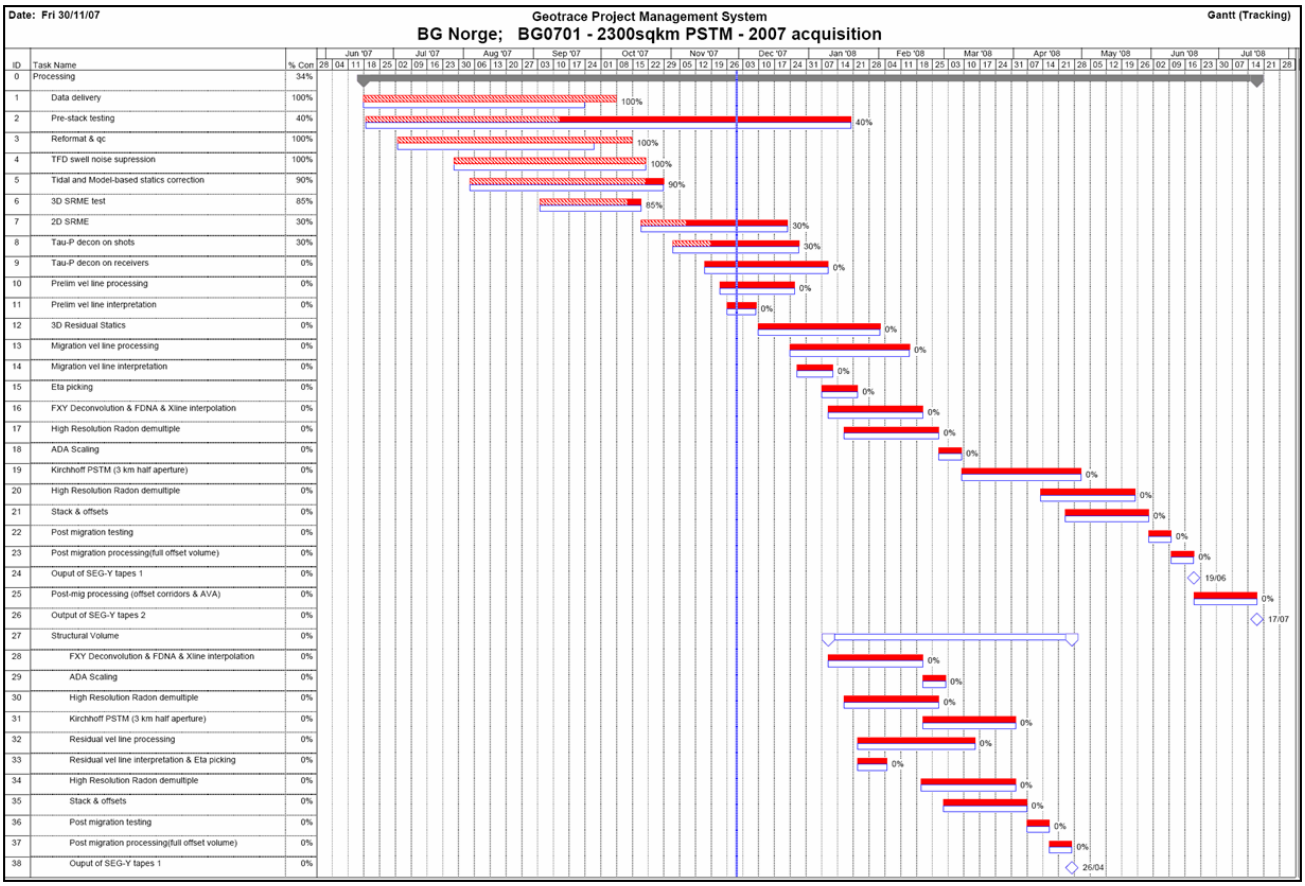


Fig. 2.2 BG07m01 Processing Sequence

Table 2.1 BG07m01 Seismic cubes

Seismic project	Project processing type	Survey name	Owner
BG07M01-PSTM-10-20-ANGLE	MIG FIN	BG07M01	PGS
BG07M01-PSTM-15-30-ANGLE	MIG FIN	BG07M01	PGS
BG07M01-PSTM-20-30-ANGLE	MIG FIN	BG07M01	PGS
BG07M01-PSTM-30-40-ANGLE	MIG FIN	BG07M01	PGS
BG07M01-PSTM-CDP-GATHERS	PRESTACK	BG07M01	PGS
BG07M01-PSTM-COLORED-INVERSION	MIG FIN	BG07M01	PGS
BG07M01-PSTM-FULL-OFFSET	MIG FIN	BG07M01	PGS
BG07M01-PSTM-FULL-OFFSET-AGC	MIG FIN	BG07M01	PGS

3 Review of geological and geophysical framework

Multiple sub-surface studies have been carried out during the licence period. The main conclusions from the key studies are:

Play Analysis

The following plays (Fig. 1.1) have been evaluated:

- Lyr Fm. Hauterivian - Barremian (Fig. 3.1)
  - Erosion of the Nordland Ridge and proximal highs
  - High probability of finding reservoir in the licence area.
  - Low probability of finding effective reservoir

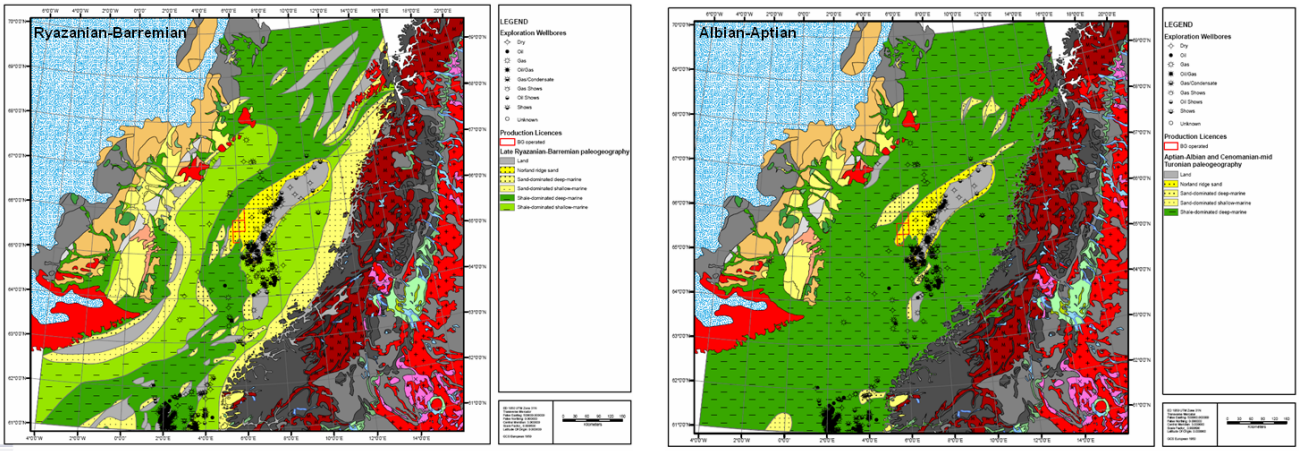


Fig. 3.1 Lower Cretaceous Paleogeography. Left: Lyr Fm. Barremian - Hauterivian. Right: Lange Fm. Albian - Aptian

- Lange Fm. Albian/Aptian - Cenomanian/Turonian (Fig. 3.1 and Fig. 3.2)
  - High probability of finding reservoir of Albia/Aptian age in the licence area. Documented in well 6507/7-12
  - Low probability of finding effective reservoir
  - Low probability of finding reservoir of Cenomanian - Turonian age

- Lysing Fm Turonian-Coniacian Fig. 3.3
  - High probability of finding reservoir in the licence area, proven play in the Halten/Rås area
  - Moderate probability of finding effective reservoir in the licence area

- Nise Fm Campanian (Fig. 3.4)
  - Low probability of finding reservoir in the licence area. Nise Fm. sandstones not penetrated in neighbouring wells.

- Egga Fm Late Maastrichtian - Danian (Fig. 3.5)
  - Low probability of finding reservoir in the licence area. Egga Fm. sandstones not penetrated in neighbouring well

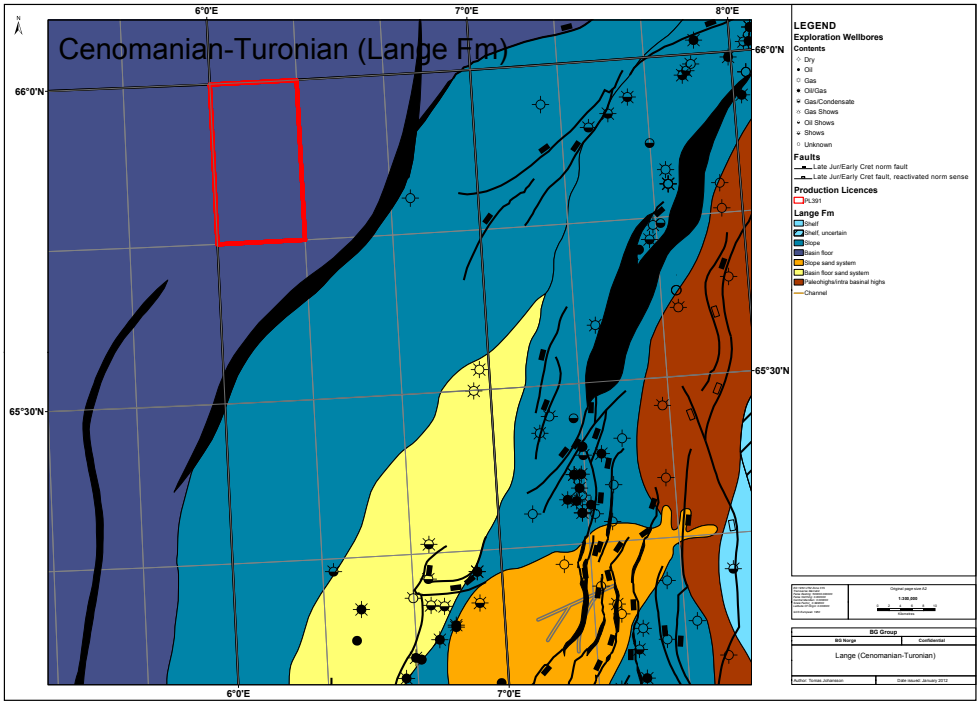


Fig. 3.2 Lange Fm. Cenomanian - Turonian Paleogeography

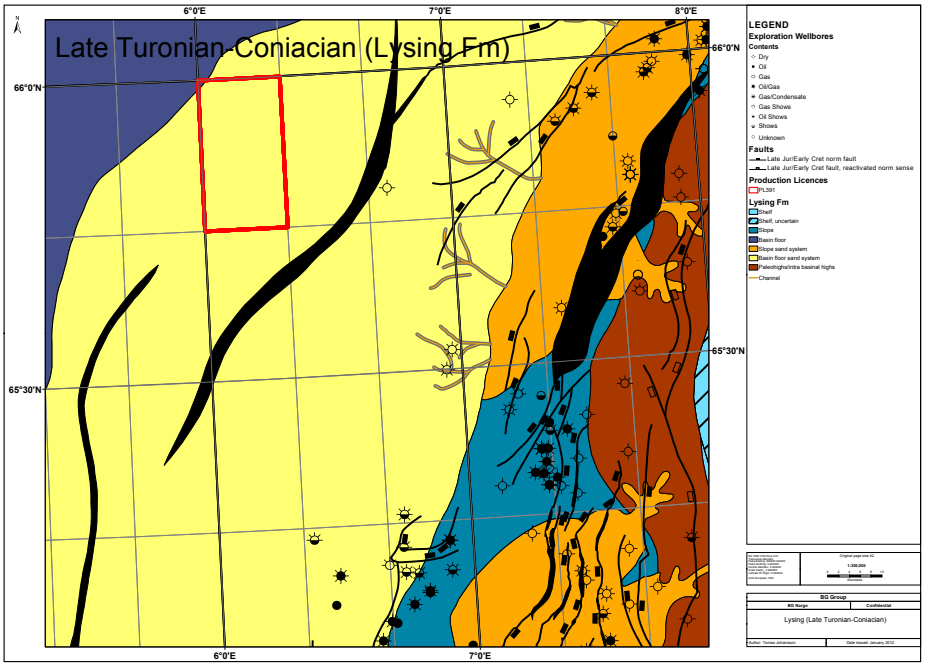


Fig. 3.3 Lysing Fm. Turonian - Coniacian Paleogeography

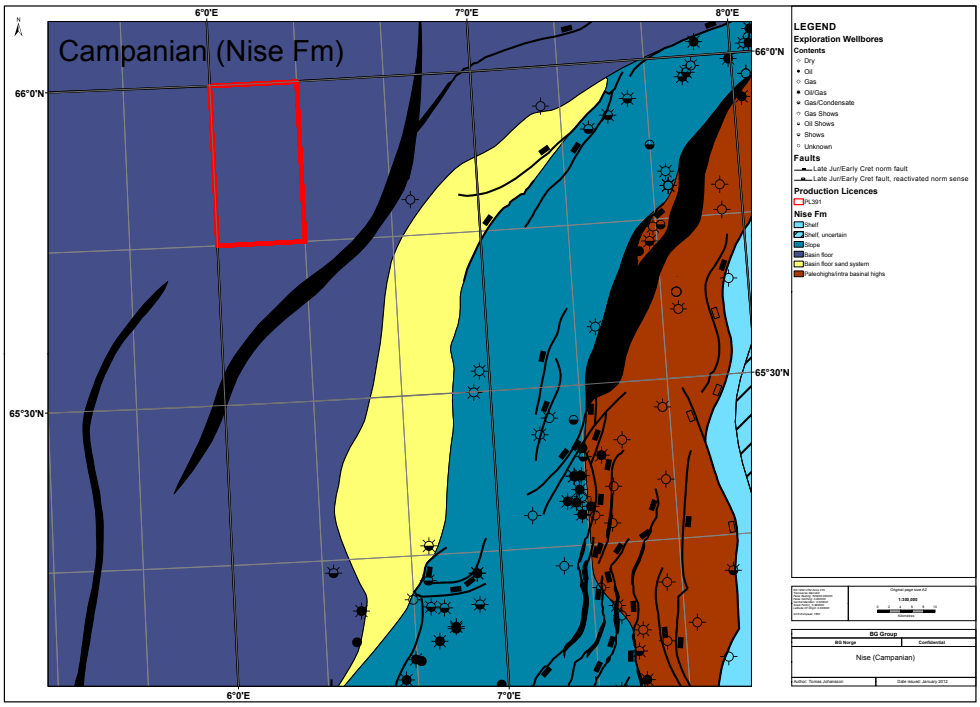


Fig. 3.4 Nise Fm. Campanian Paleogeography

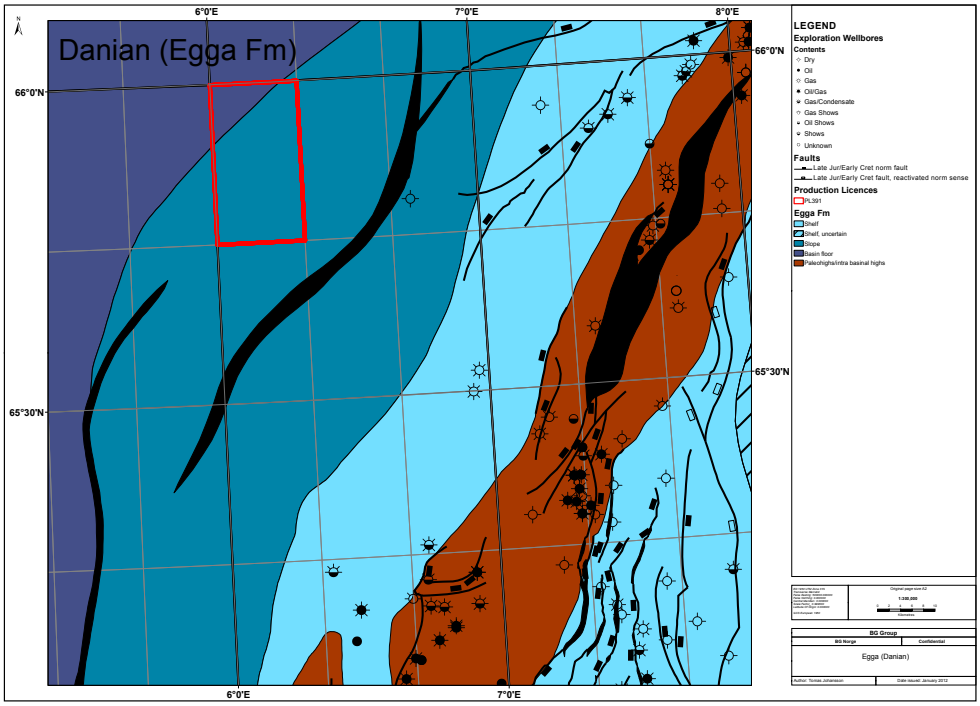


Fig. 3.5 Egga Fm. Late Maastrichtian - Danian Paleogeography

Biostratigraphic studies

PetroStrat has carried out biostratragraphic studies for the Nise Fm., Lysing Fm. and Lange Fm. (Fig. 3.6) in the following wells: 6406/1-2, 6406/2-1, 6406/3-2, 6406/2-6, 6505/10-1, 6506/11-1, 6506/11-2, 6506/11-3, 6506/11-6, 6506/12-4, 6506/12-5, 6506/12-6, 6506/12-8, 6506/12-10, 6506/3-1, 6506/6-1, 6507/2-2, 6507/5-1, 6507/5-3, 6507/5-4, 6507/7-1, 6607/5-1, 6608/10-5, 6610/3-1 & 6610/3-1R.

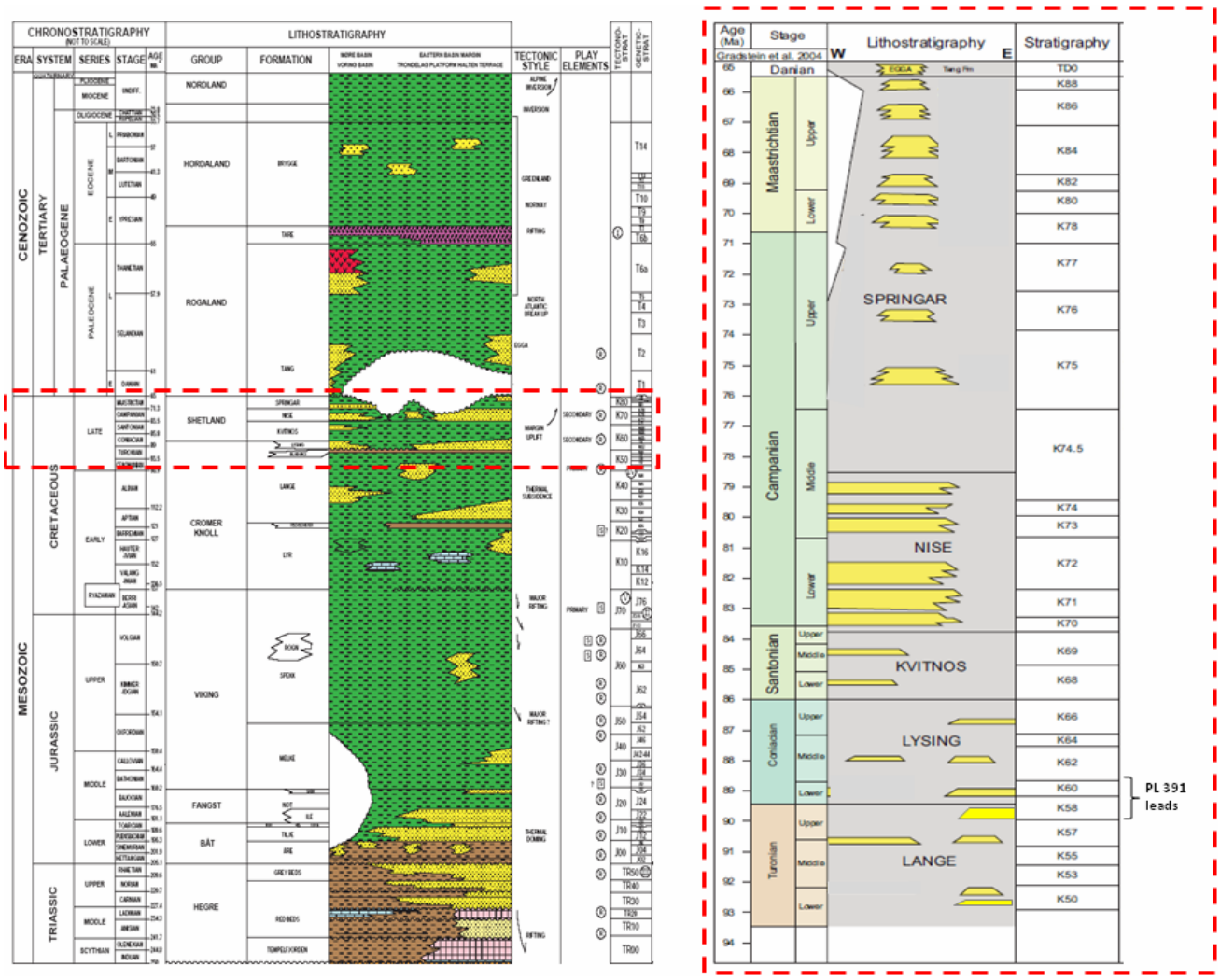


Fig. 3.6 Norwegian Sea/Halten Terrace Stratigraphy

Regional Evaluation of the Lange Formation

A regional evaluation based on wells and seismic interpretation was carried out for the Lange Fm. The conclusions from this study are:

- The Lange Fm sandstone generally seems to be concentrated along the Nordland Ridge
- Most prospective levels are K50 and K53 sequences
- The K50 sandstones seem to be present where K53 is sandprone and vice versa due to compensation cycles. In the Smørbukk area both sandstones seem to be present.
- Amplitude maps indicate that the Lange Fm. sandstones (K50 sequence) may have a source area to the north (Fig. 3.7)
- Lange Fm is not considered as a prospective sequencel in PL391

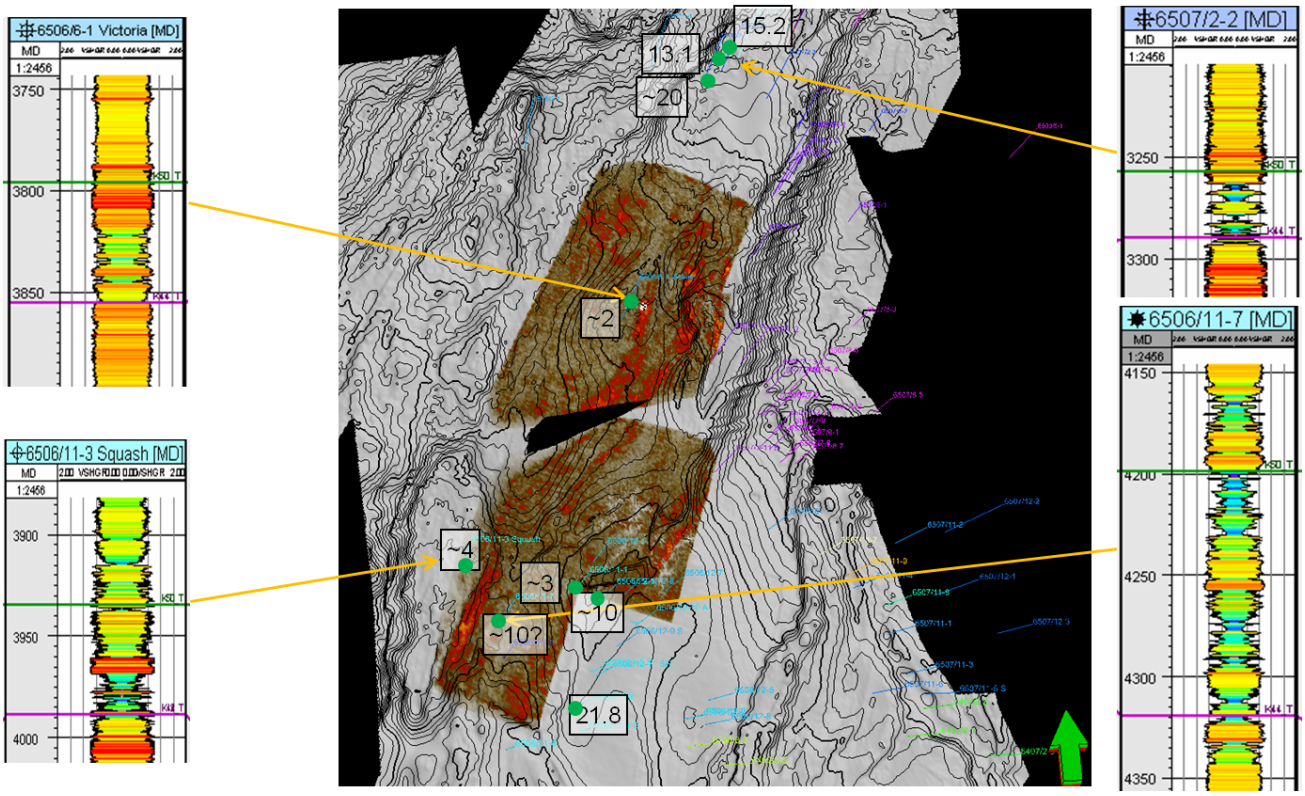


Fig. 3.7 Lange Fm. K 50 seismic amplitude RMS map draped over the depth map with Lange Fm. sandstone thickness annotations

Lysing Fm. reservoir

The main reservoir target is the Turonian-Coniacian Lysing Formation (Fig. 3.6). The Lysing formation is a deep-water turbiditic system encountered by a number of wells on the Halten Terrace with variable thickness and quality (Fig. 3.8). A regional study based on wells, cores, biostratigraphy and seismic interpretation concludes that Lysing formation sandstones are shed from the Nordland Ridge and deposited as slope channels and basin floor fans. The slope and basin floor topography had a large impact on the distribution of the reservoir sandstones (Fig. 3.9).

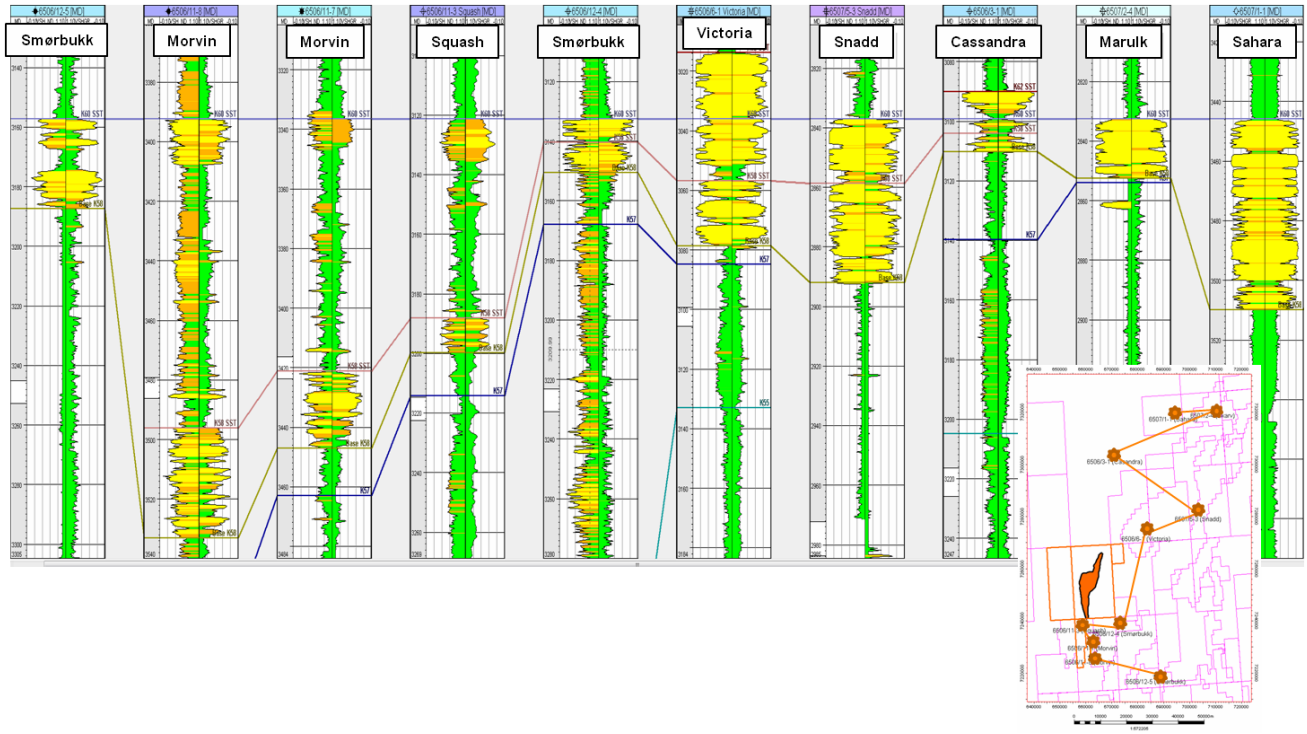


Fig. 3.8 Well correlation of Lysing Fm. at the Halten Terrace

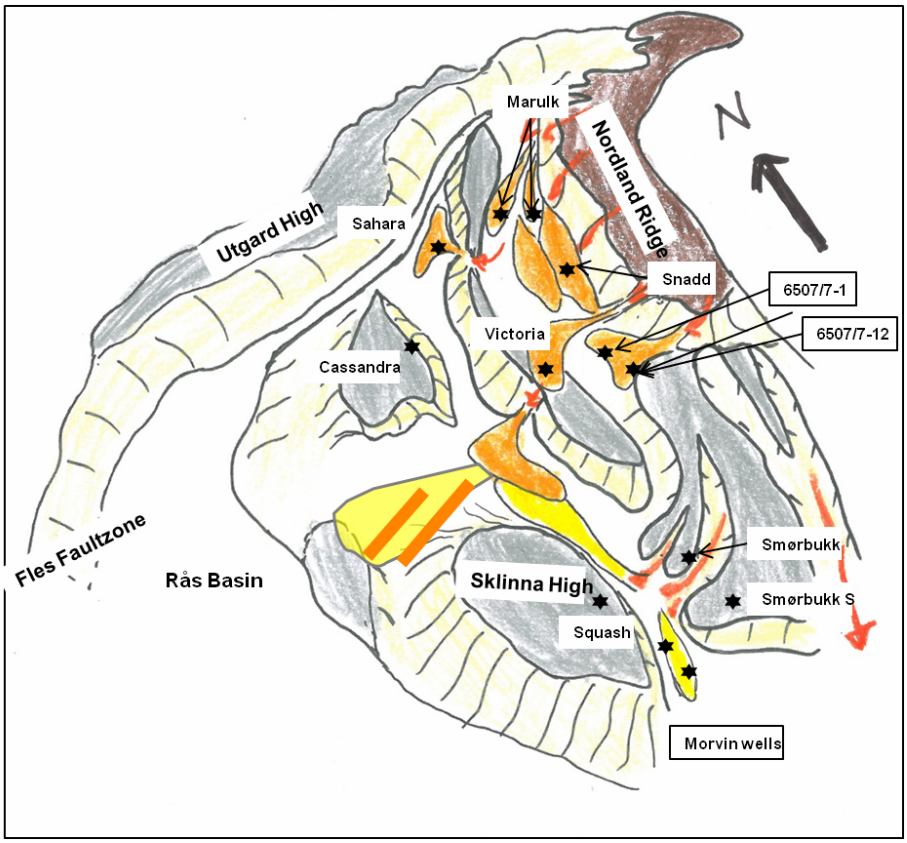


Fig. 3.9 Regional review of Lysing fan

Palaeocene and Campanian Clastic distribution from seismic interpretation and well data

- In the Vestfjorden Basin to the north east, well 6610/3-1 penetrated a complete record of clastic input from Paleocene to early Jurassic. Sandstone sequences were recorded in the early Paleocene, early and Late Cretaceous and middle - early Jurassic
- There are no clear indications from well data that sandy deep marine turbidite systems have reached the PL391 area in Campanian to Paleocene times (Nise and Egga Fm) from the Lofoten area. The full stack seismic reflection data show low impedance contrasts, with transparent sections, and provids little support for clastic prograding wedges.
- Conclusions
    - The Upper Cretaceous Nise Fm. and the Lower Paleocene Egga Fm. is not considered to be sandprone in the PL 391 area.

3D structural reconstruction

The objective of the study was to assess palaeobathymetry and basin topography through time in the Rås Basin for input to 3D basin modelling and possible accomodation space for coarse clastic deposition. Palaeobathymetry restorations reveal the presence of a NE-SW trending palaeo-high during Upper Cretaceous in the westernmost part of the studied area creating a depositional low and a thickening of the sequence east of the paleo-high. The sediment isochores show a general thickening of the Upper Cretaceous sequence from east to west in the licence area (Fig. 3.10).

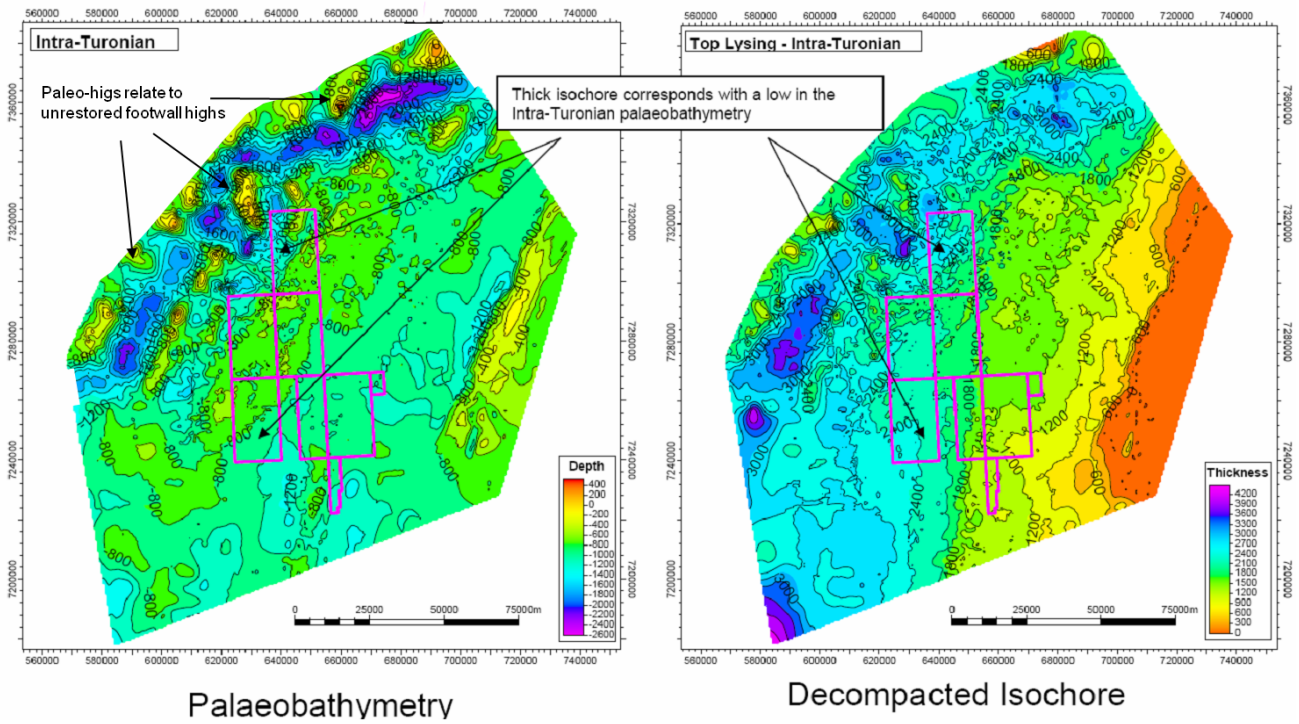


Fig. 3.10 Results from the structural reconstruction. Left: Intra Turonian paleobathymetry Right: Lysing Fm. decompacted isochore

Cretaceous Source Rock Potential and Basin Modeling

The main source rock in the area is the Spekk Fm. Geochemical studies of the well 6506/11-3 provide support for a possible source rock of Cenomanian - Turonian age. The extent and quality of this source is unknown. Provided that the Cretaceous source rock is present and the seal for the Lysing Fm sandstone is sufficient, a 50-100m thick Cenomanian-Turonian source rock having a TOC of 2-3% is able to charge large volumes. Consequently the leads will be charged from the Cretaceous source rock (Fig. 3.11). The contribution from an Upper Jurassic source rock might be limited since this source is late mature to overmature during the development of the traps (Fig. 3.12). Fig. 3.13 shows the petroleum system for the Lysing Fm.

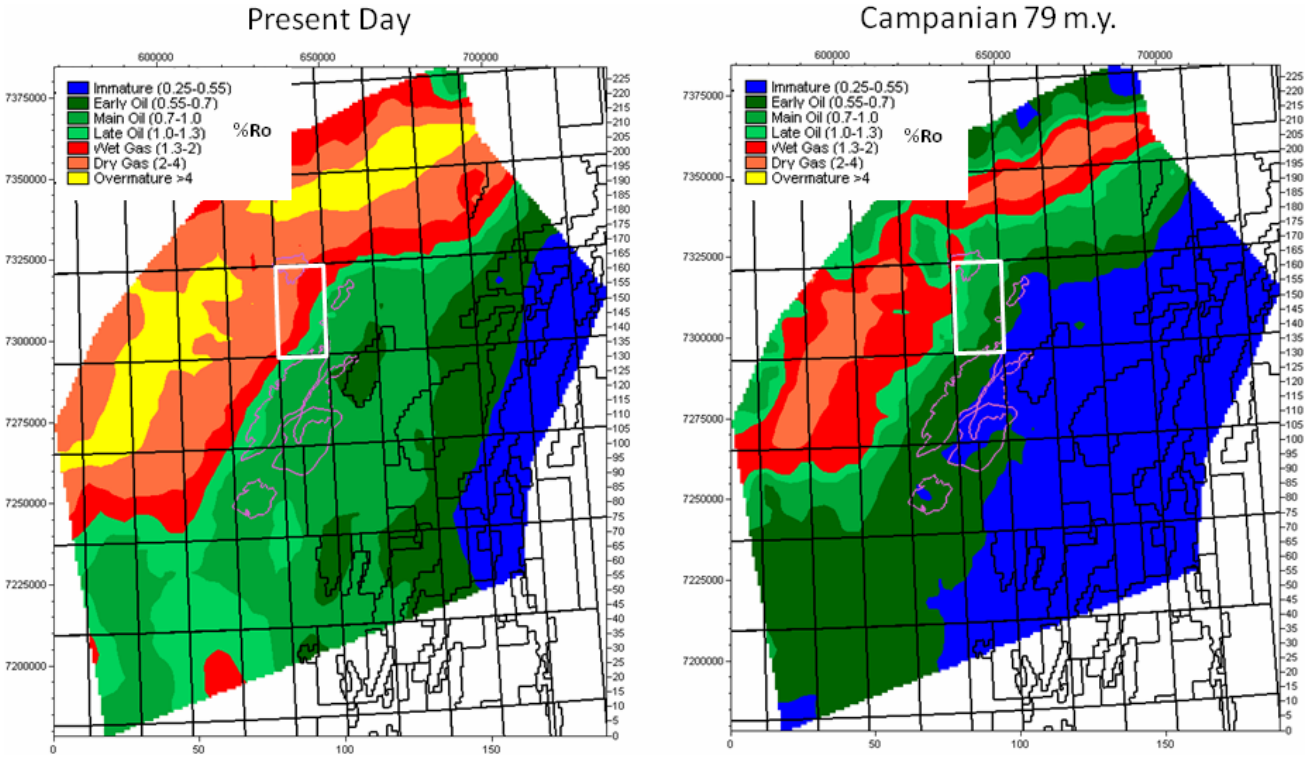


Fig. 3.11 Cenomanian - Turonian source rock maturity

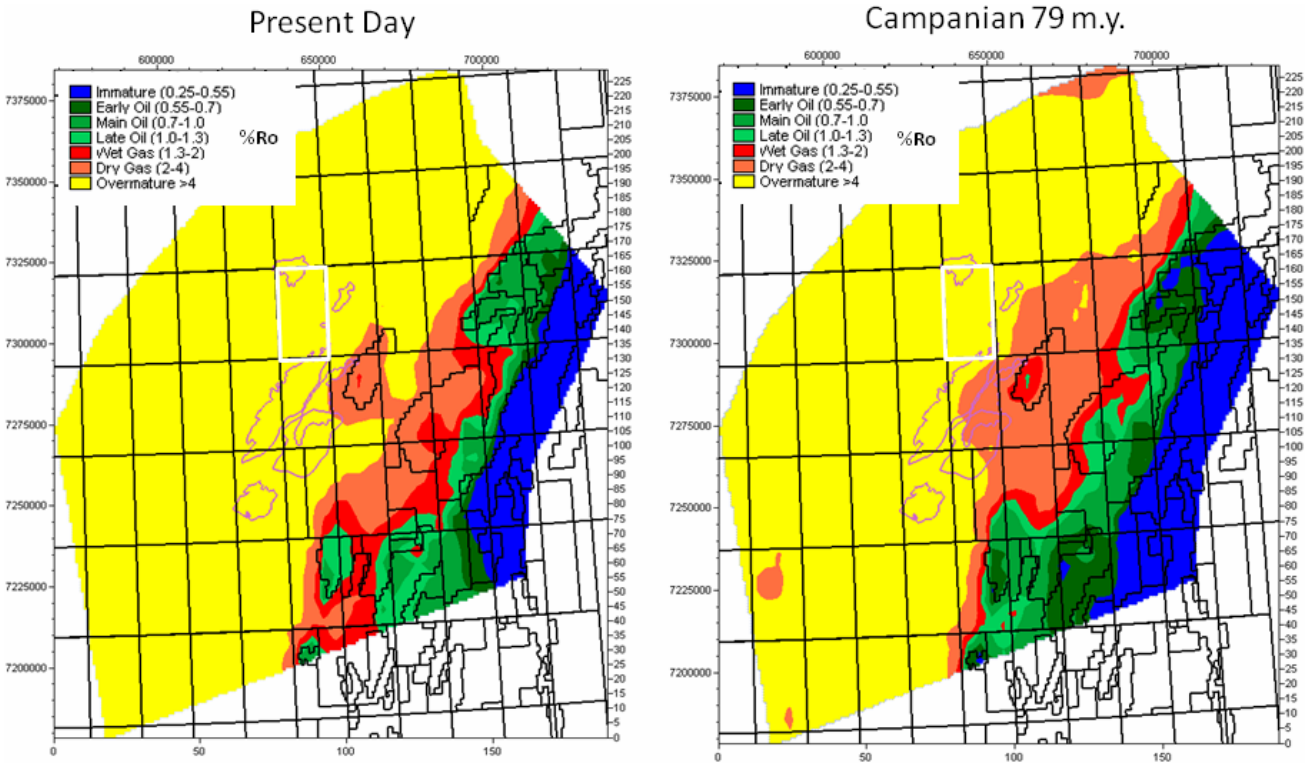


Fig. 3.12 Spekk Fm. source rock maturity

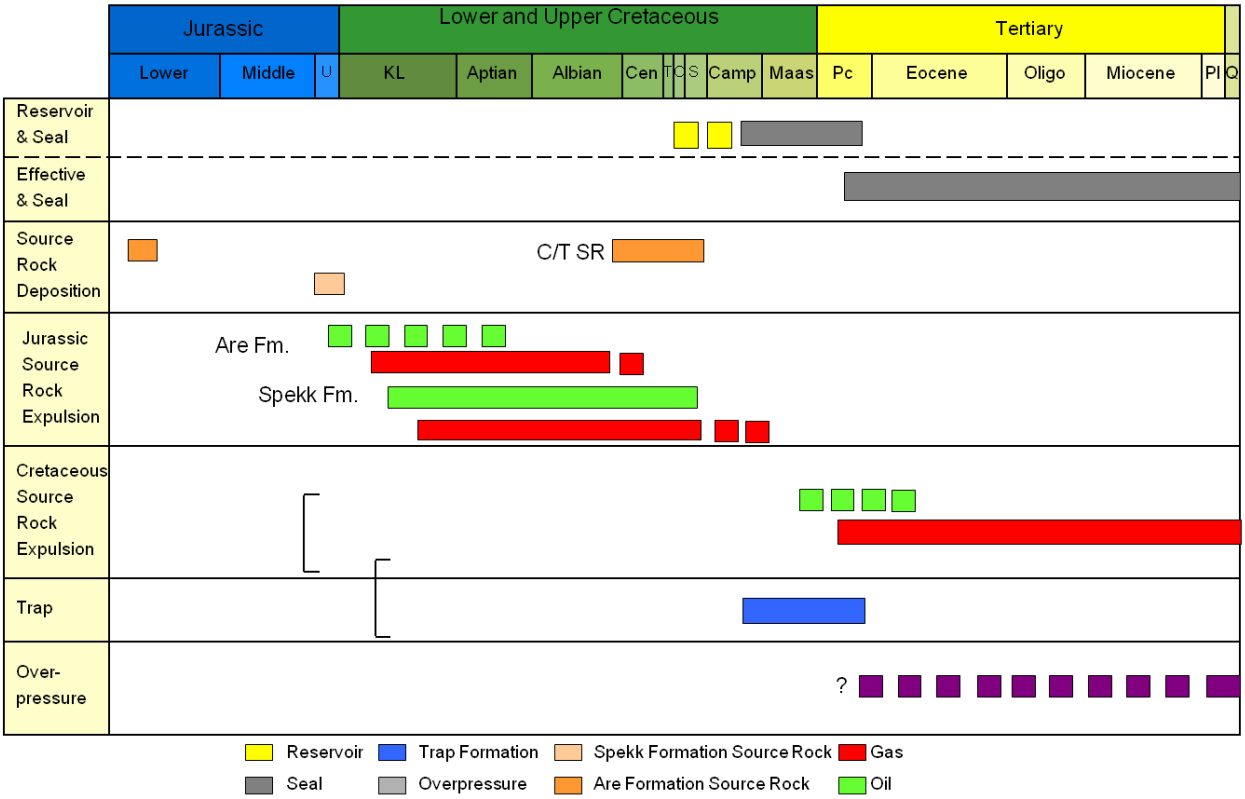


Fig. 3.13 Petroleum System Lysing Fm.

Regional Rock Physics

A regional rock physics study was initiated for the Lysing and Lange Fm. in order to address the following:

- Rock Properties
- Seismic response (AVO modelling)
  - Porosity changes (compaction)
  - Fluid fill
  - Shale effect
  - Sand classification
- Feasibility for Pre-stack Inversion

The following wells were included in the study: 6505/8-1, 6507/7-12, 6507/5-4, 6507/5-3, 6506/6-1, 6506/3-1, 6506/12-3, 6506/11-7, 6506/11-3 and 6505/10-1, 6506/11-8, 6506/11-3 and 6507/2-4

The conclusions from the seismic AVO Modelling are:

- Porosity variations are expected to have a large impact on the seismic response
- Expected AVO anomalies are: AVO class II, AVO class IIP and AVO class III depending on porosity and fluid fill (Fig. 3.14).
- Gas filled sandstones result in negative amplitudes (SEG polarity data) and AVO class III (Fig. 3.15 and (Fig. 3.16).
- The AVO response for low gas saturated, low quality sandstones shows an AVO dimming (Fig. 3.17).
- Inversion Feasibility
  - Rock property cross plots (Fig. 3.14) and AVO studies suggest that higher porosity sandstones can be distinguished from lower porosity sandstones and inversion can add information although final results will depend on seismic quality.

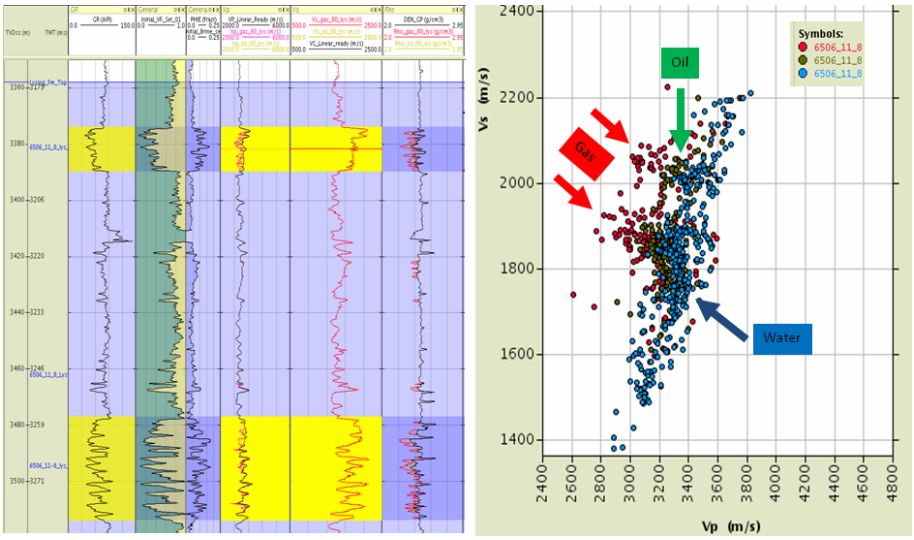


Fig. 3.14 Well 6506/11-8 Substitution effect of oil and gas in Lysing Fm.

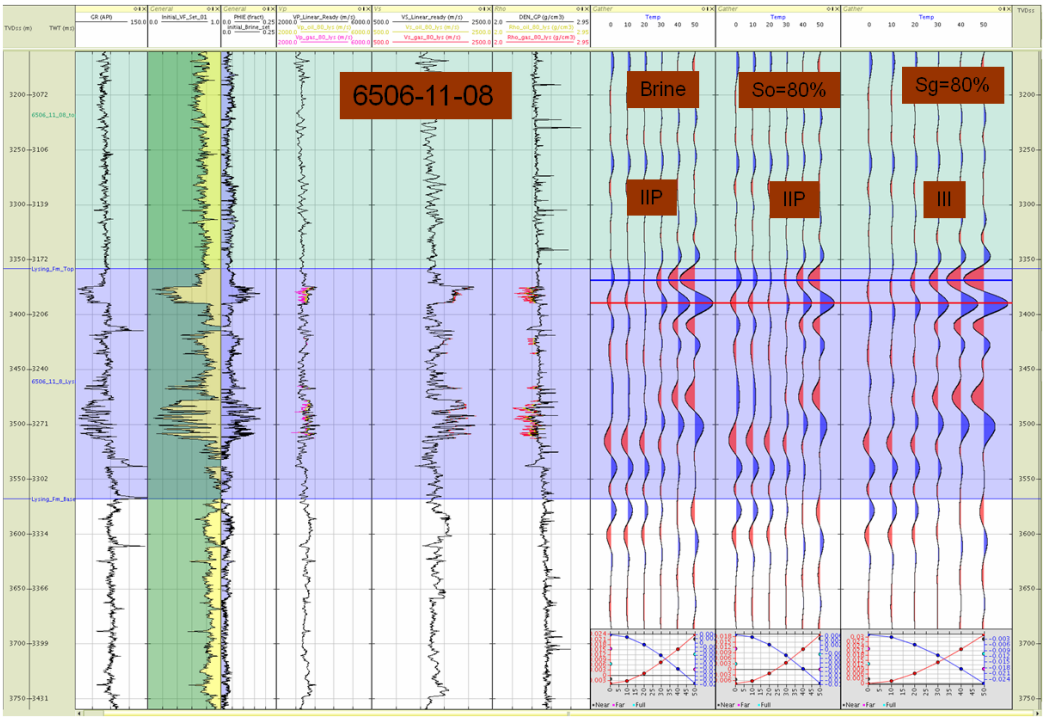


Fig. 3.15 6506/11-8 AVO effect of fluid fill (Lysing Fm.)

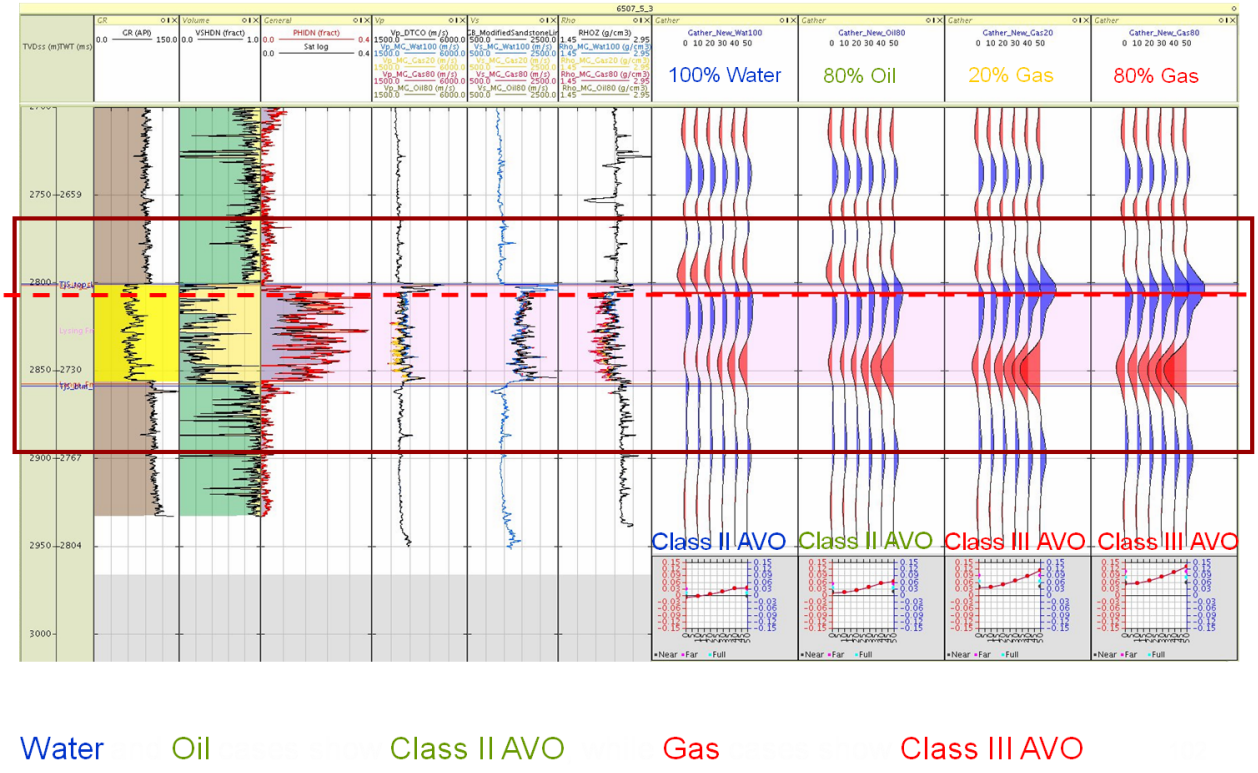


Fig. 3.16 Synthetic gathers 6507/5-3 Lysing Fm.. Note: Diffigult to distinguish between 20% gas saturated sandstone and 80% gas saturated sandstone

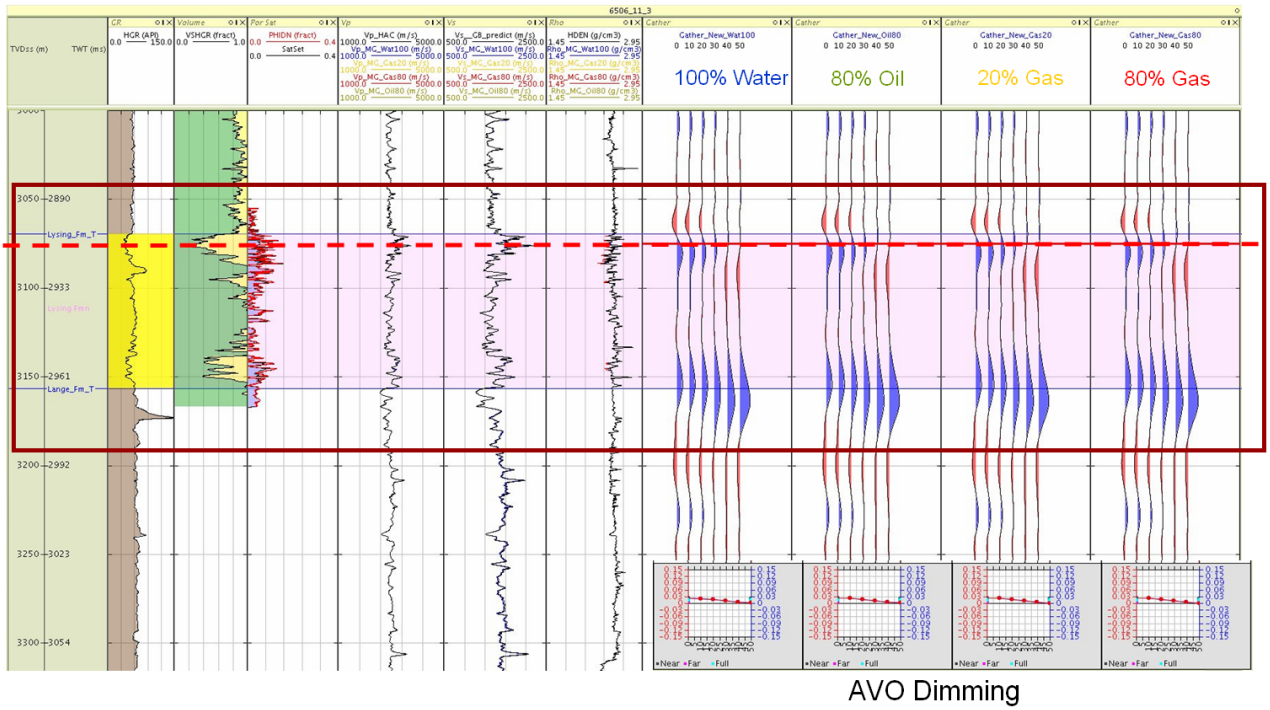


Fig. 3.17 Synthetic gathers 6506/11-3 Lysing Fm.*. Well 6506/11-3 shows an AVO dimming due to low porosity and low gas saturated sandstone*

CSEM 1D Modelling Feasibility Study

- Two wells were used in the modelling:
  - 6505/10-1 as reference case
  - 6707/10-1 for gas resistivities (from Springar Fm).
- The modelling was carried out varying the thickness of the Nise reservoir from 100 to 200m and also investigated the effect of depth on the magnitude of the observed anomaly.
- Conclusions:
  - An oil case is not likely to cause an EM anomaly
  - A gas filled sandstone exceeding 100m is likely to cause an EM anomaly
  - A gas filled sandstone thinner than 100m might cause an EM anomaly

Depth conversion

The depth conversion was done in Petrel and based on stacking velocities. Seismic velocities are derived from BG07m01, BG0801, MC3D-Halten and SH9602_aker, The following horizons are used as input:

- Top Model (0ms),
- Seabed (Fig. 3.18)
- Mid Miocene Unconformity
- Base Tertiary
- Top Lysing (Fig. 3.19).
- Base Model (6000ms)

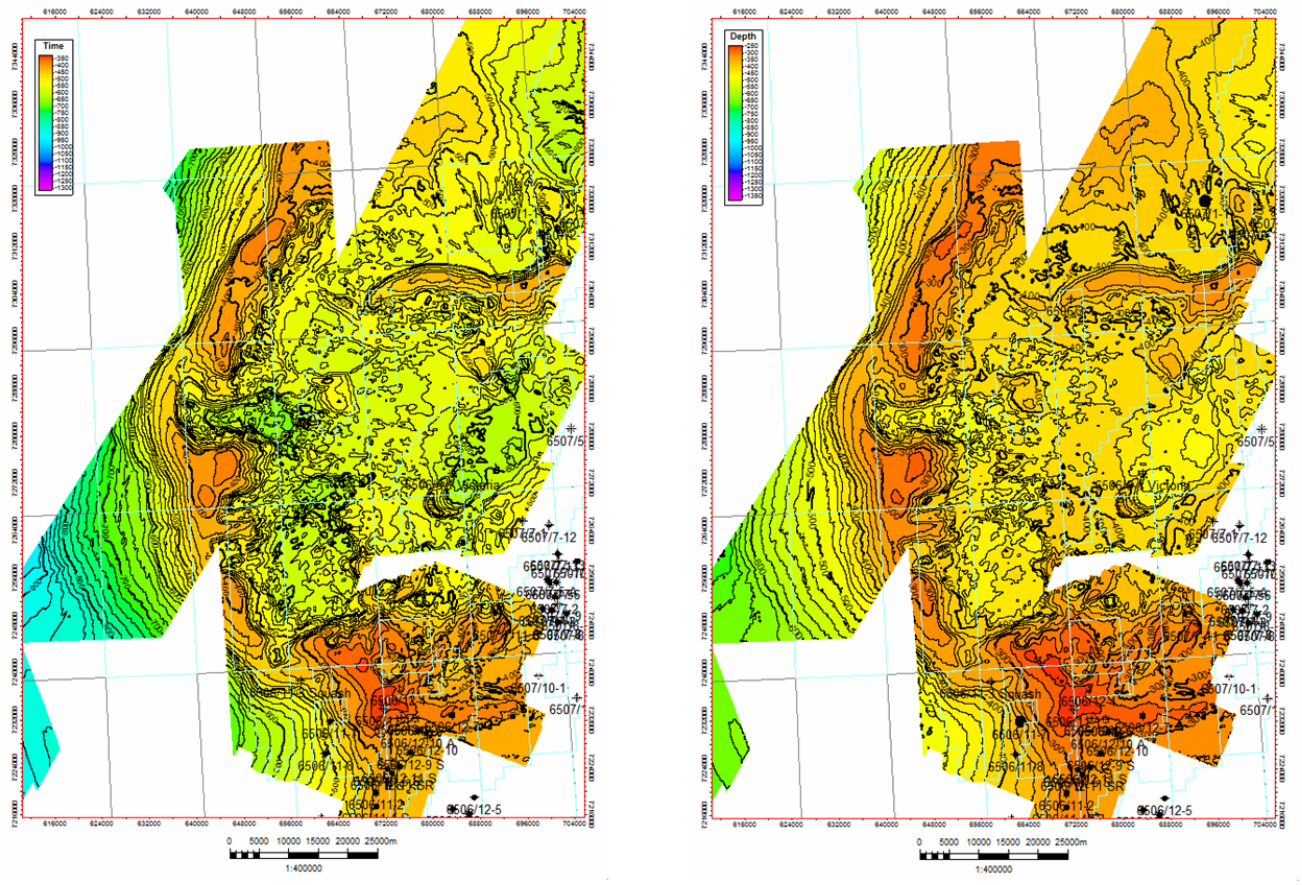


Fig. 3.18 Structural map Seabed. Left: Time Right: Depth

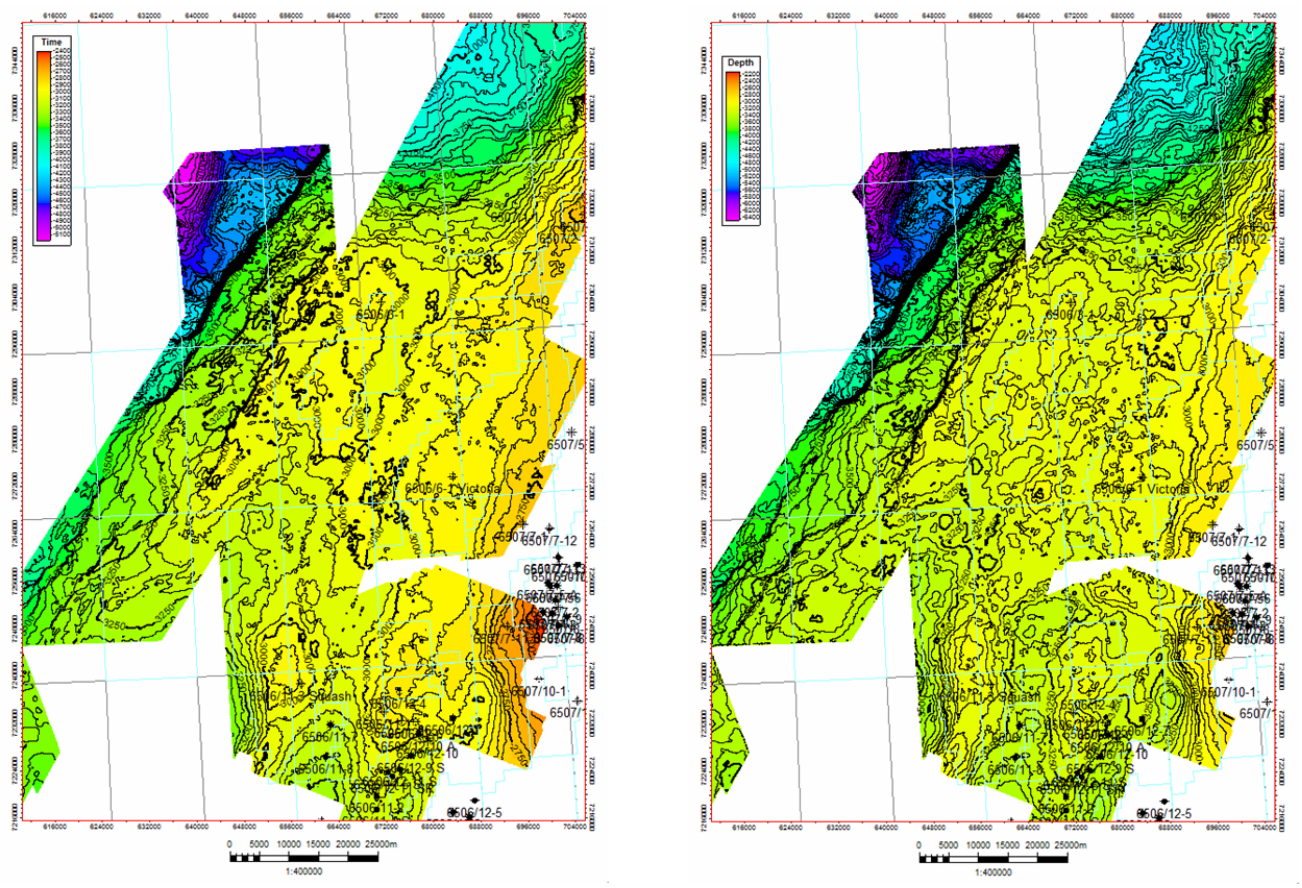


Fig. 3.19 Structural map Top Lysing Fm.*. Left: Time Right: Depth*

The velocity model was built using the following steps:

- Cleaned the input data by removing spikes etc.
- Generated interval velocity cube .Smoothed the interval velocity cube within each zone.
- Calibrated the interval velocity cube from Base Tertiary to Base model to reduce misties:
  - Base Tertiary - Top Lysing : 0.88
  - Top Lysing - Base Model : 0.83
- Converted the interval velocity cube to a average velocity cube
- A velocity model was created and tied the input horizons (model) to wells

4 Update of resource potential

In the the 19th round application three leads were defined at Lysing Fm. level with the Gresskar lead being the largest (Fig. 4.1). Interpretation of the new BG07m01 3D seismic data changed the understanding of the area and the Gresskar lead as mapped in the application, disappeared. The new mapping identified two new leads Lysing North and Lysing South. Additionall three leads were defined at Nise Fm. level

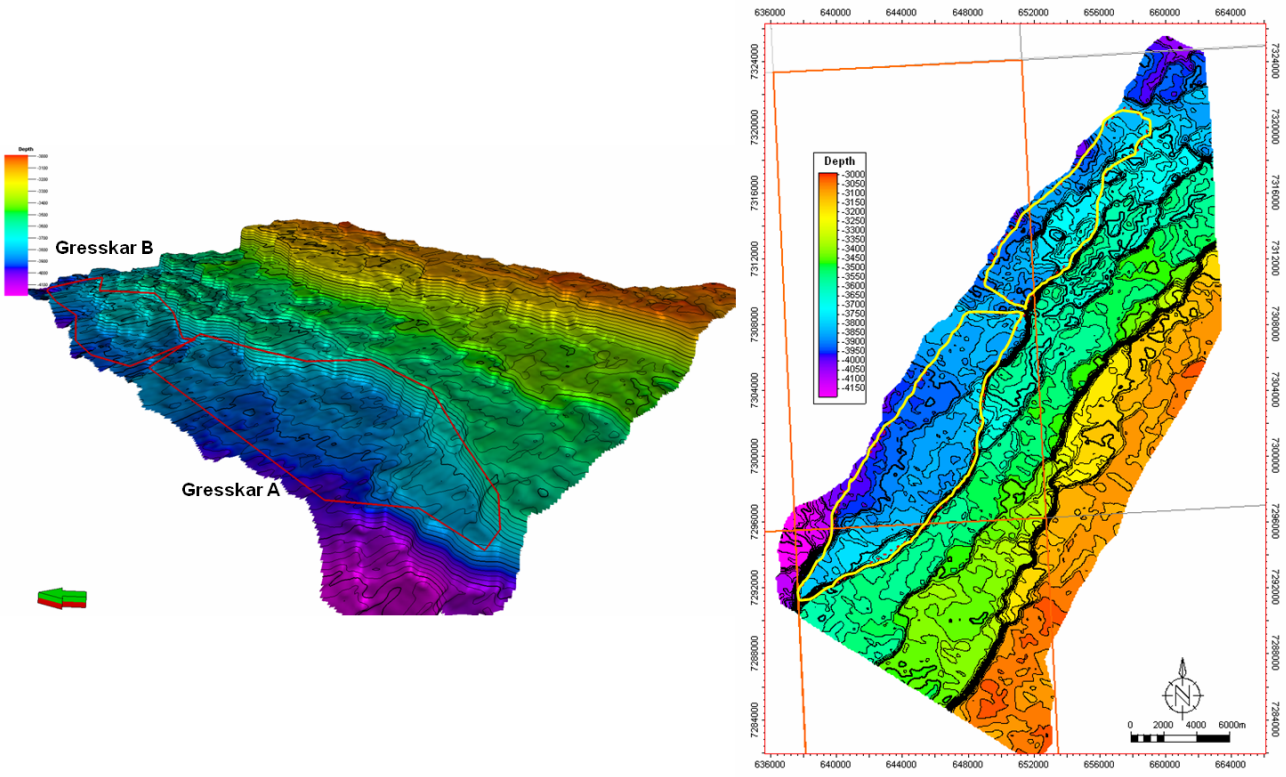


Fig. 4.1 Gresskar lead evaluation

Lysing Fm. leads

The Lysing North and South leads are both low relief fault bounded structures dependant of sealing faults to the east (Fig. 4.2 and Fig. 4.3). The leads have limited resource potential. The main risks for the leads are:

- Moderate to high risk on effective reservoir
  - No seismic amplitudes or AVO anomalies supporting high quality reservoir and HC accumulations

- High risk on trap
  - Fault seal dependant traps

- High to moderate risk on source and migration
  - Cretaceous source rock not properly proven
  - Spekk Fm. overmature at the time of trap formation

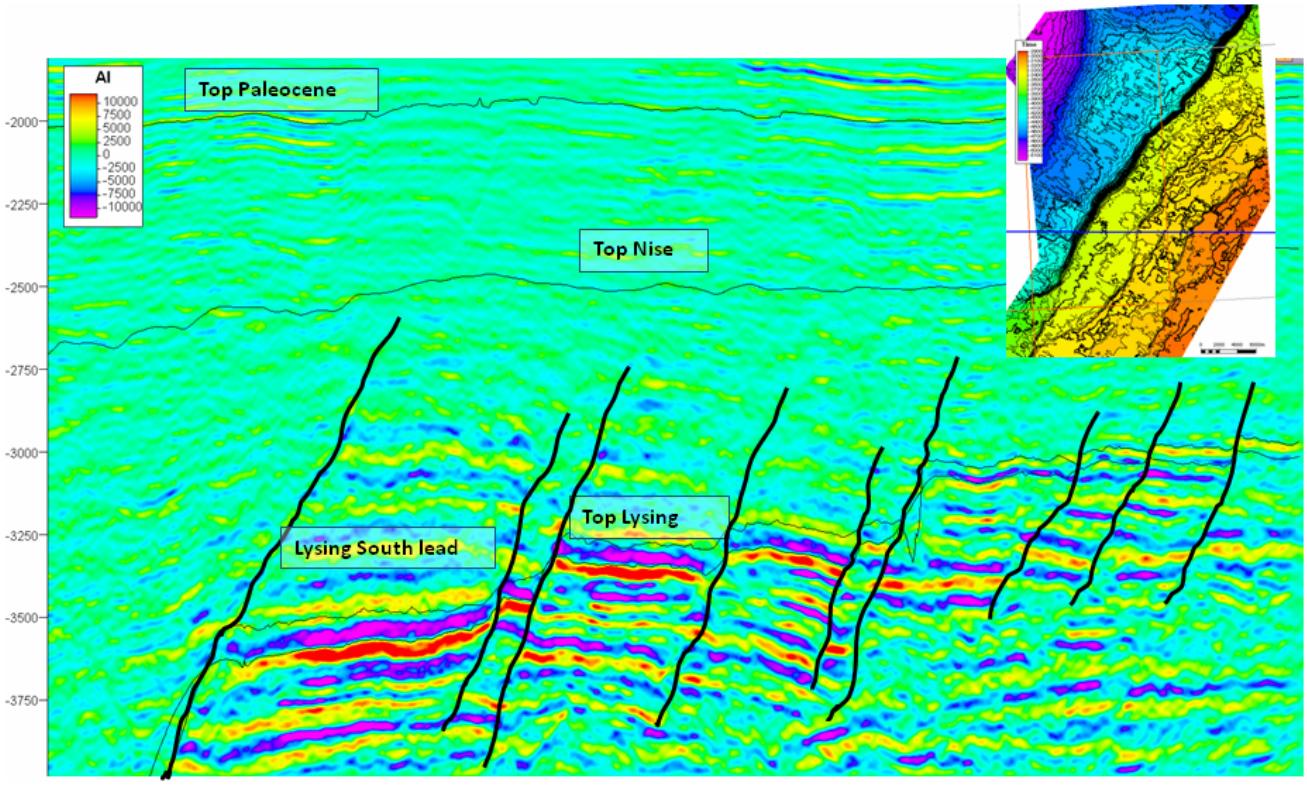


Fig. 4.2 Coloured inversion sesimic Lysing South lead. Note: The Lysing South lead is dependant on a sealing fault to the east

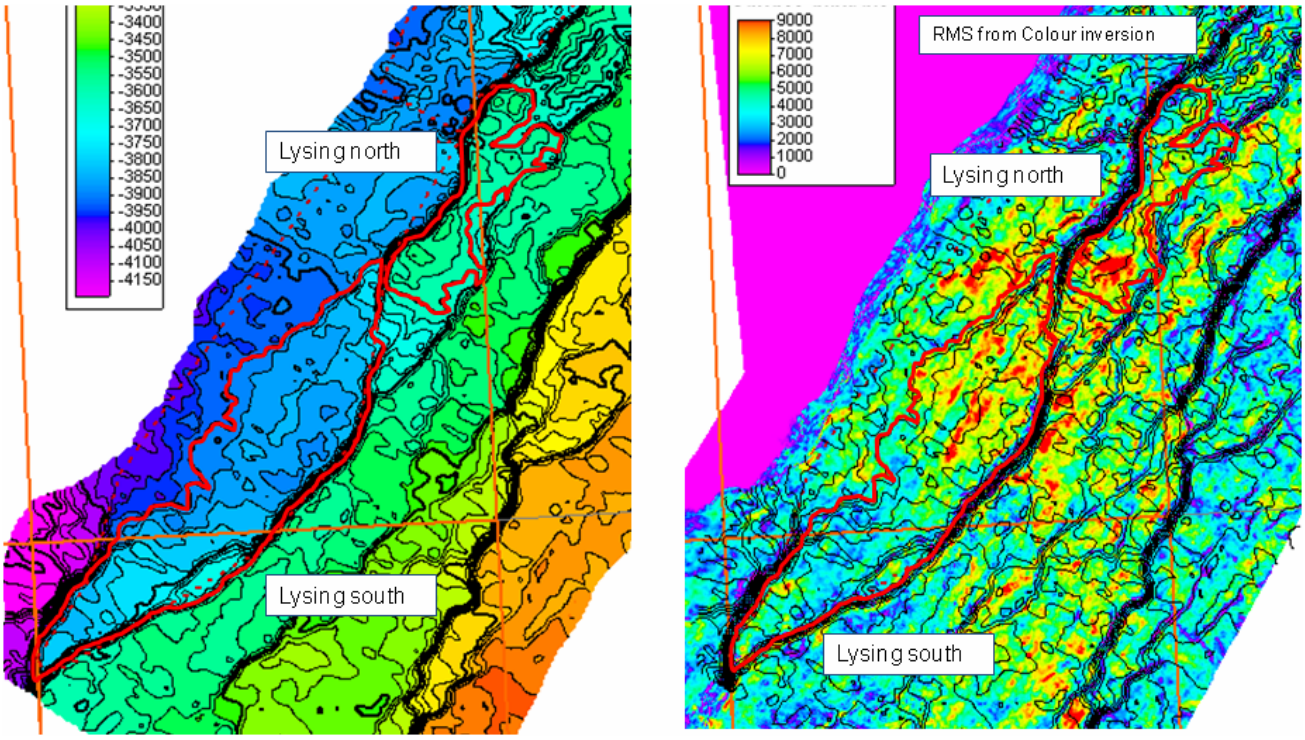


Fig. 4.3 Lysing North and South leads. *Left: Lysing Fm. strctural depth map Rigth: RMS attribute from coloured inversion seismic draped over Lysing Fm. structural depth map.*

Nise Fm. leads

Three leads have been identified at the Nise Fm. level (Fig. 4.4 and Fig. 4.5). The main risks for the leads are:

- High risk on presence of reservoir
  - No seismic indication of Nise Fm. reservoir

- High to moderate risk on source and migration
  - Cretaceous source rock not properly proven
  - Spekk Fm. overmature at the time of trap formation

Volumes and chance of success are summerized in Fig. 4.6, Fig. 4.7 and Fig. 4.8.

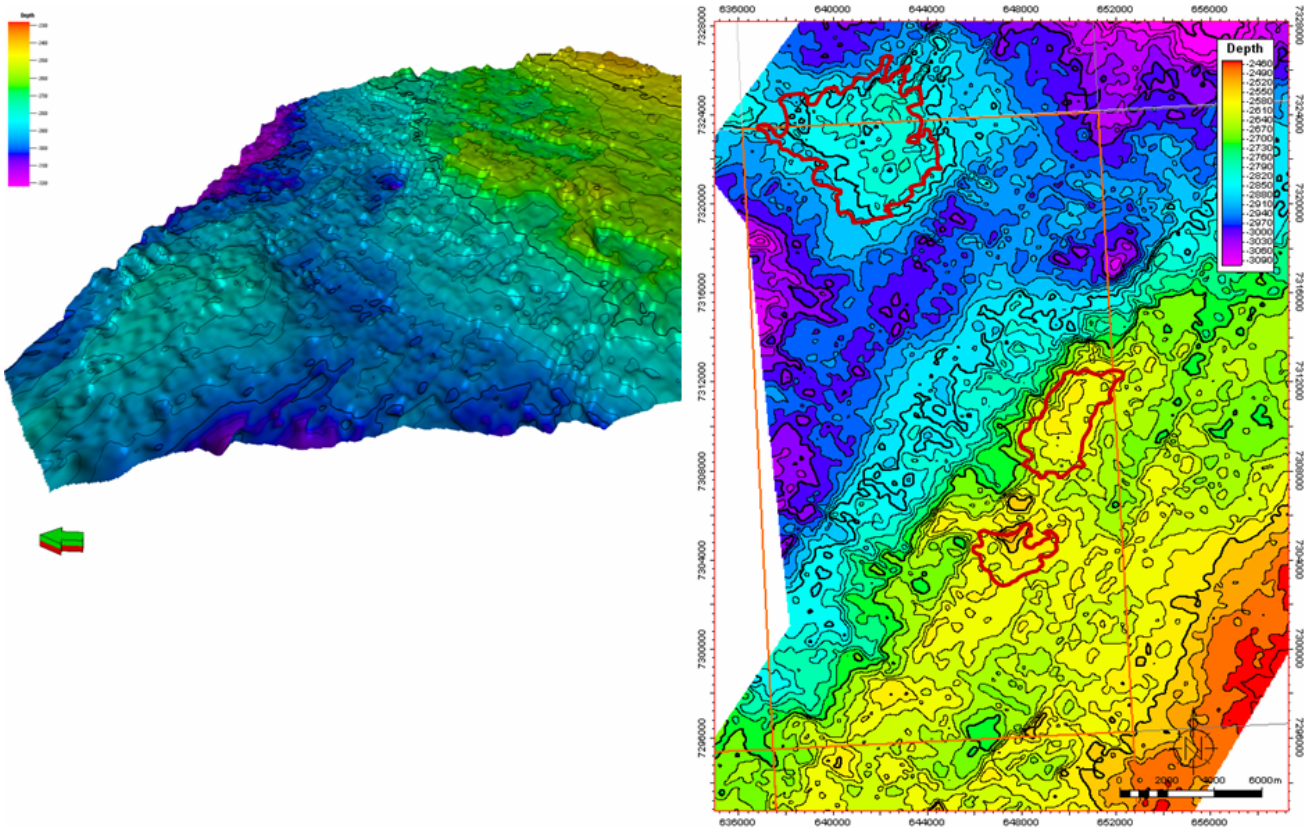


Fig. 4.4 Nise Fm. leads

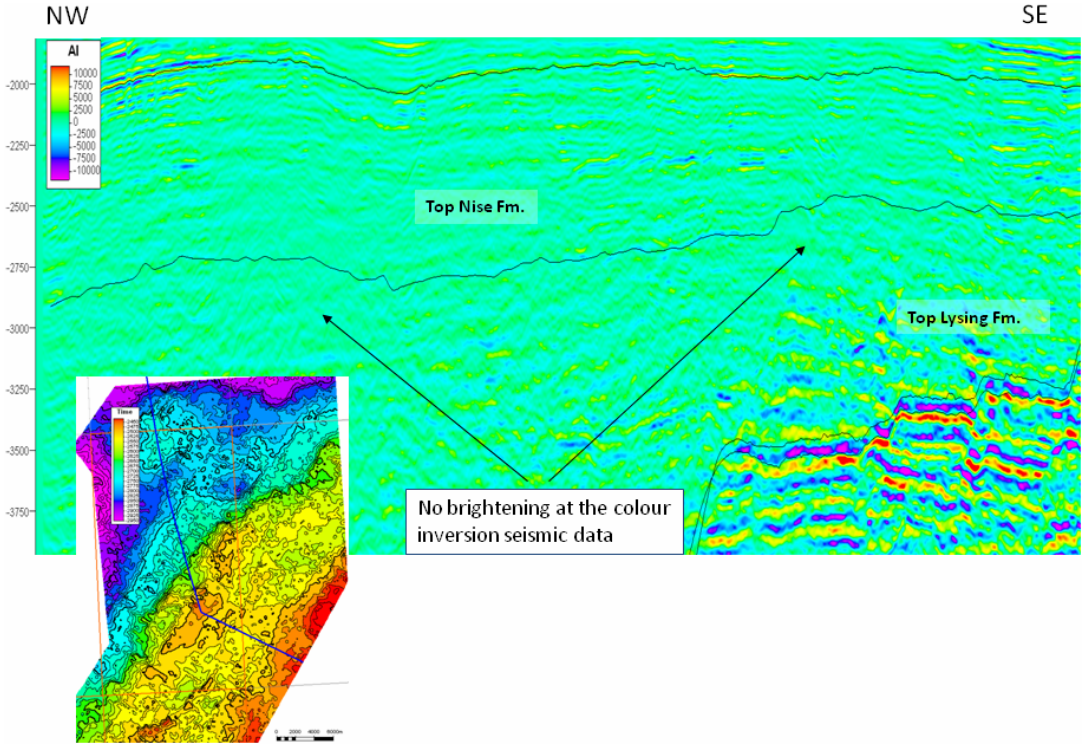


Fig. 4.5 Coloured inversion sesimic Nise Fm. leads

	Risk	In Place GSm³			Recoverable GSm³		
		P90	Mean	P10	P90	Mean	P10
Lysing N	0.12	0.3	1.3	2.6	0.2	0.8	1.4
Lysing S	0.07	0.4	1.3	6.2	0.2	0.8	3.5
Nise 1	0.04	0.5	2.9	6.3	0.4	1.4	4.3
Nise 2	0.025	0.8	1.8	3.2	0.5	1.3	2.2
Nise 3	0.025	0.1	0.4	0.8	0.1	0.2	0.6

Fig. 4.6 Volumes for the Lysing Fm. and Nise Fm. leads

	Lysing S	Lysing N	
Risk Element	COS	COS	Comments
Tp	0.40	0.70	Tp is a fundamental issue for South which is highly dependant on fault seal. North is a small 4-way dip closure with low relief
Te	0.80	0.8	Based on the basin modelling study results and knowledge from the Kvitnos shale we are optimistic.
Sp	1.0	1.0	HC source is assumed proven with Spekk Fm. and Cretaceous source rocks
Se	0.8	0.8	If source is present, we are optimistic that it will generate HC to the traps based on the modelling study
Rp	0.65	0.65	Incline to optimism. Support from wlls, seismic and depositional models for the area. However 6506/3-1 well result is not positive
Re	0.4	0.4	If reservoir is present, we are inclined to pessimism for the quality. It will be more silty than wells in the east and the depth of burial will reduce the quality
COS	**0.07**	**0.12**	

Fig. 4.7 Chance of success for the Lysing Fm. leads

	Nise 1	Nise 2	Nise 3	
Risk Element	COS	COS	COS	Comments
Tp	1.0	0.6	0.6	We are certain or inclined to optimism on the existence of traps. However, the seismic imaging is poor and two of the leads have low relief
Te	0.4	0.4	0.4	Trap formation very late and top seal capacity not present when Spekk Fm. has maximum expulsion
Sp	1.0	1.0	1.0	HC source is assumed proven with Spekk Fm. and Cretaceous source rocks
Se	0.45	0.45	0.45	We are inclined to pessimism. Kvitnos shales might be sealing and prevent vertical migration from older source rocks. Lysing Fm. will act as a horizontal migration path towards east.
Rp	0.3	0.3	0.3	Pessimism. No support for reservoir in offset wells, structural restoration and seismic and inversion data
Re	0.8	0.8	0.8	If reservoir is present, we are poptimistic that it should be of sufficient quality even if it may be distal
COS	**0.04**	**0.025**	**0.025**	

Fig. 4.8 Chanceof success for the Nise Fm. leads

5 Conclusions

All work commitments in the licence have been fulfilled and through extensive sub-surface studies BG has concluded that prospectivity is challenged and the chance of finding hydrocarbons in the licence is very low. BG recommended therefore to relinquish the license due to:

- Limited resource potential with low chance of success.
- No new relevant geological or geophysical data are known to be aquired in the near future that can bring adequate information to the licene area.
- No wells are planned to be drilled in near future that can bring new knowledge to the licence area.