Relinquishment Report of PL668

Relinquishment Report of PL668

List of figures

List of tables

1 KEY LICENSE HISTORY

Introduction

The PL668 license was awarded as an APA 2012 license covering parts of Block 7/12 (Fig. 1.1) with two identified prospects - Etta and Gang. PL668 was eventually awarded without the acreage covering the identified Gang Prospect. Centrica Resources (Norge) AS (Centrica) has been the Operator since the award. The license group and the ownership overview is listed below:

- Centrica Resources (Norge) AS: 40% (Operator)
- Faroe Petroleum Norge AS: 30%
- Tullow Oil Norge AS: 30%

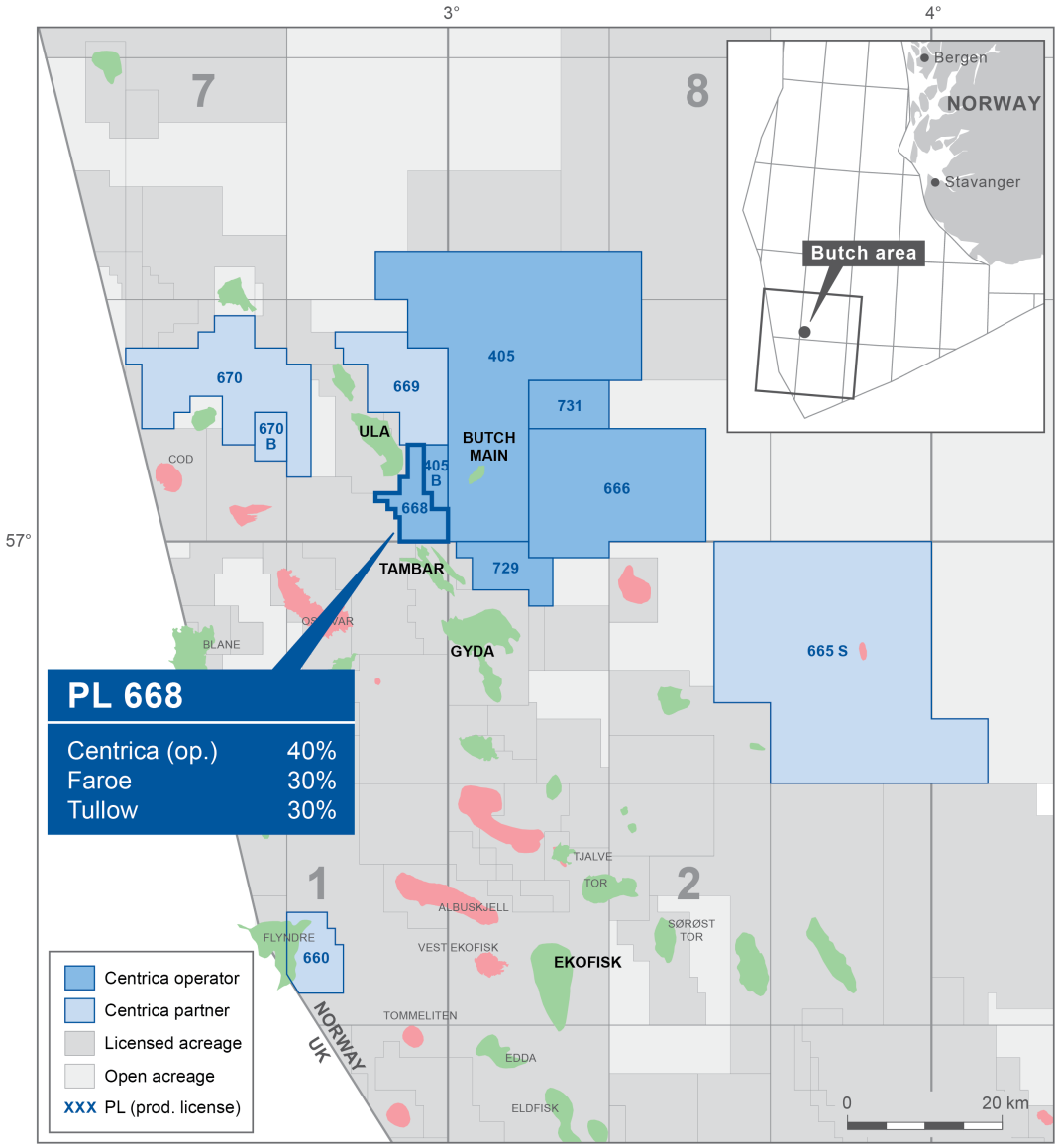

Fig. 1.1 PL668 in the Greater Butch Area

Commitments, Meetings and Conclusion

PL668 was awarded with a 7 year initial period (2+2+2+1 years). A Drill or Drop decision was set to be met by February 8th 2015. Work commitments for the license required acquisition (purchase) of 3D seismic over the license area within 2 years from award in addition to geology and geophysics (G&G) studies. The work program is fulfilled (see 2 DATABASE for details).

Centrica proposed in the first PL668 license meeting held in March 2013 to arrange two regular Management Committee Meetings (MC) each year. The proposal was also to host additional meetings when deemed appropriate by licensees and activities.

Below is an overview of license meetings held in PL668:

PL668 EC/MC Meeting #1 (Kick-off meeting) held March 23rd 2013
PL668 EC/MC Meeting #2 held December 4th 2013
PL668 EC/MC Meeting #3 held November 19th 2014

The partnership in PL668 has conducted a review of the prospectivity in the licensed acreage. The conclusion from this review is that all partners agree to and will relinquish the whole licensed acreage as it is currently considered not containing prospective opportunities. The decision is therefore unanimously to relinquish PL668.

The agreement to in the partnership is documented on License 2 Share (L2S) February 2, 2015. The Notice of Relinquishment was sent to the Ministry of Petroleum and Energy February 2, 2015.

2 DATABASE

The common license database in PL668 is part of a large semi-regional database similar to several common databases in Greater Butch Area licenses with the same partnership as in PL668: PL666, PL729, PL731.

Seismic data

The work program for the PL668 license included the purchase of 3D seismic and conduct of relevant Geology and Geophysics (G&G) studies. The seismic data purchase is fulfilled and the 3D seismic survey CE1202 was included in the common seismic database. The updated mapping of seismic horizons is conducted on the CE1202. The PL668 common seismic database consists of several 3D surveys and reprocessed surveys and was used as the main dataset for the license group prior to the APA process. During this time, the PL405 Butch wells, 8/10-5 S and 8/10-6 S, were matured to drilling based on CE1202, and this survey also covers all of PL668. The maturation of the Etta Prospect was mainly done using CE1202 dataset. See Fig. 2.1 for an overview of the PL668 database.

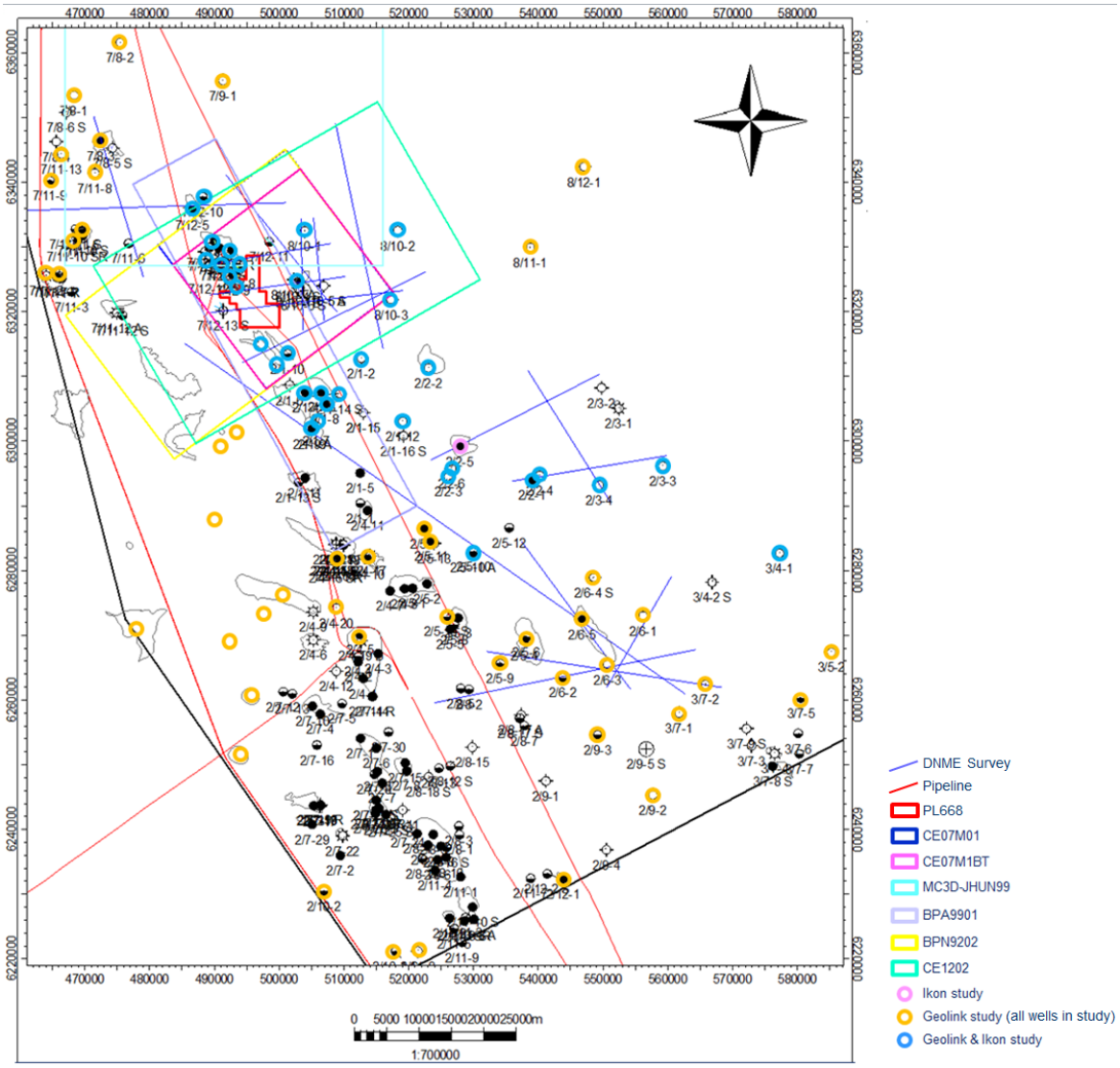

Fig. 2.1 PL668 Common Database. *The common database consists of 3D seismic surveys and the majority of the exploration wells in the Greater Butch Area.*

Seismic Survey	Type	Vintage	km²	Version
CE07M01	3D	2007	518	Full, Near, Mid, Far
CE07M1BT	3D	2009	315	Full, Near, Mid, Far, Ultrafar
MC3D-JHUN99	3D	1999	1847	Full
BPA9901	3D	1999	164	Full
BPN9202	3D	1992		Full
CE1202 PSDM (all azimuths)	3D	2012	1589	Full, Near, Mid, Far, Ultrafar

Table 2.1: PL668 common seismic database

Well data

The common well database consists of all released wells in the area at the time of license award. This database has been expanded with the most recent wells in the area, 8/10-5 S and 8/10-6 S drilled in 2013 and 2014. See Fig. 2.1 for an overview of the well database and the wells used in the different studies performed in the Greater Butch Area and utilized in the PL668 Etta Prospect evaluation process.

3 REVIEW OF GEOLOGICAL FRAMEWORK

Structural Setting

PL668 is located in the Norwegian Central Graben between the Cod Terrace and the Sørvestlandet High along the transition zone of the Ula-Gyda Fault Zone (Fig. 3.1 - PL668 is positioned between the Cod Terrace and the Sørvestlandet High along the Ula-Gyda Fault Zone), immediately west of Centrica's operated PL405 8/10-4 S (Butch Discovery, 2011). The Ula-Gyda Fault Zone is characterised by Late Jurassic to Early Cretaceous extensional and oblique slip faulting accompanied by salt tectonics. The Triassic and Jurassic geological history of the Central Graben area is strongly affected by the presence of salt which controlled thickness variations in the Triassic and Early Jurassic (Hodgson et al, 1992). Salt walls collapsed during Late Jurassic time, triggered by the rifting, and accommodation space was created for the Upper Jurassic Ula Fm sands. During rifting, and later inversion in Tertiary time, saline fluids would have percolated up faults and is the mechanism that is invoked to account for sealing faults in the Ula Field. The regional chronostratigraphy of the Central Graben area is shown in (Fig. 3.2). The main reservoir interval is the Ula Fm sandstone of mainly Kimmeridgian age. This can be correlated from the Ula Field eastwards to the 8/10-4 S well. The sand was deposited in a shallow marine shoreface environment.

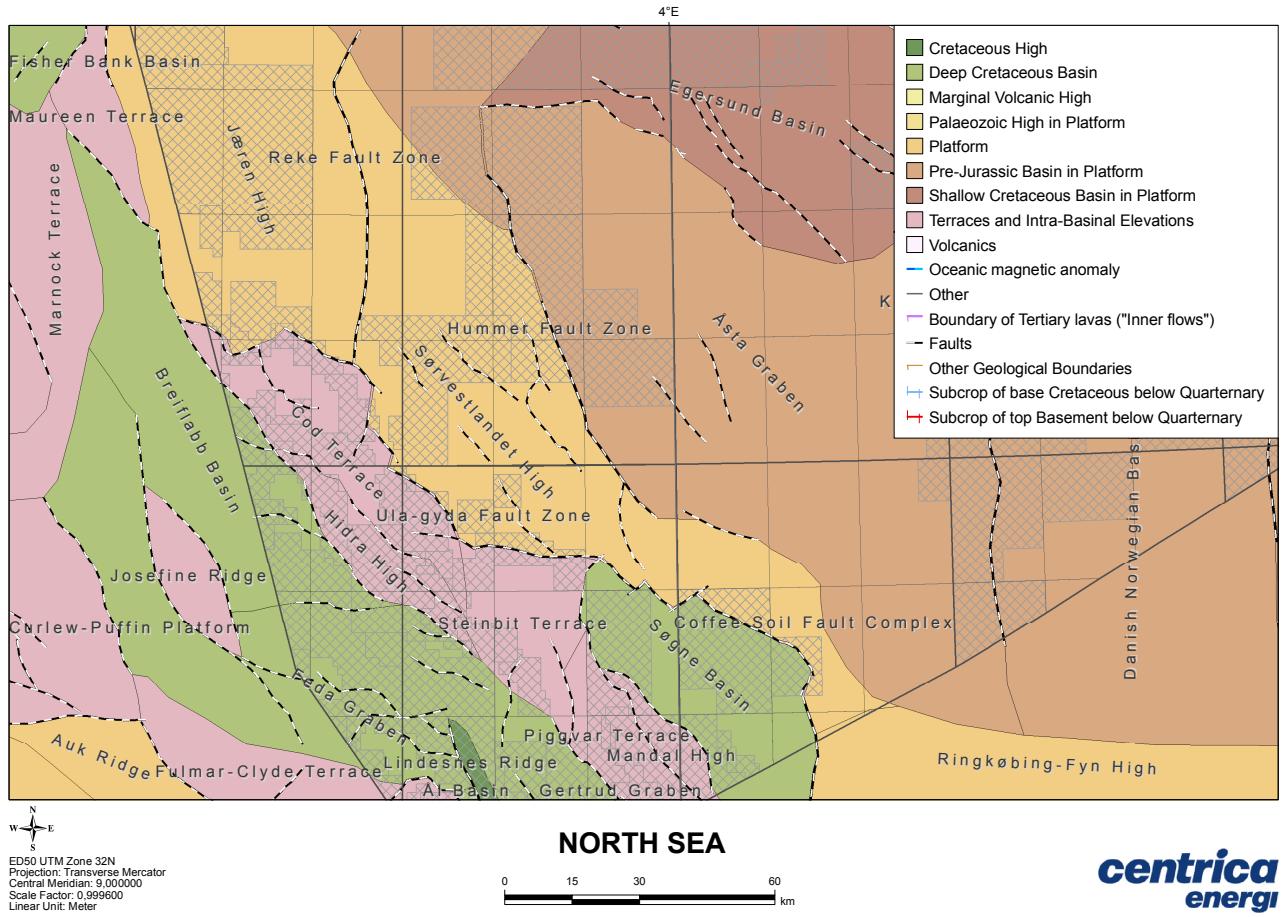

Fig. 3.1 Structural Elements - North Sea Ula-Gyda Faults Zone Sørvestlandet High. *PL668 is positioned between the Cod Terrace and the Sørvestlandet High along the Ula-Gyda Fault Zone.*

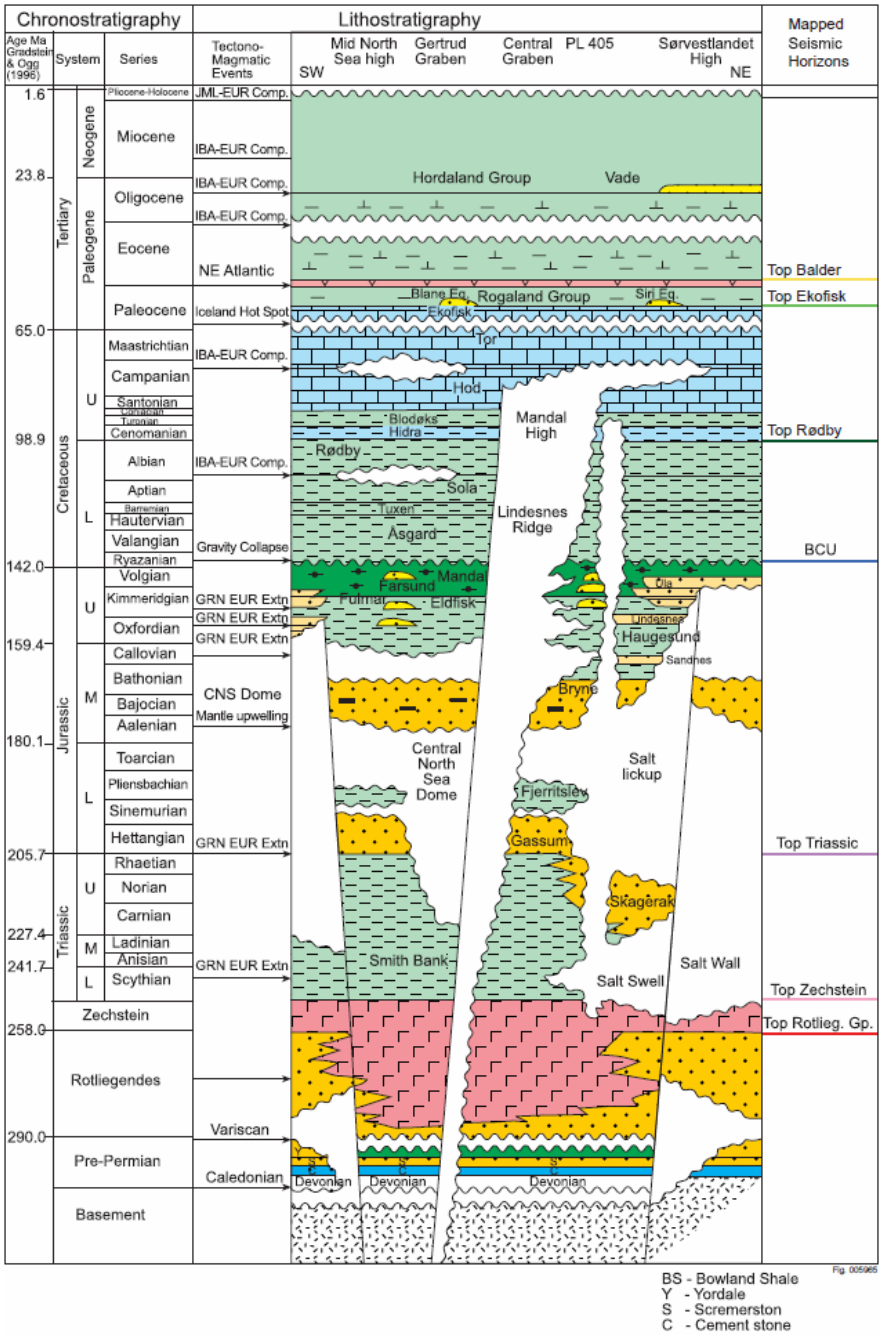

Fig. 3.2 Chrono- and Lithostratigraphic Framework in the Central Graben

PL668 Prospectivity and Challenges

The main challenge to de-risk the Etta Prospect was considered to be migration into the trap from the surrounding potentially mature kitchen areas. Also considered a challenge was the potential erosion of strata in some areas over Etta. Uncertainty was linked to the thickness of the reservoir sand and also the richness of the source rock (Mandal and Farsund Fms). These challenges are addressed in the G&G studies completed and described below.

DNME survey - Greater Butch Area

ORG Geophysical AS has carried out DNME surveys in the North Sea with a number of lines crossing prospects in the Greater Butch Area (ORG Geophysical AS, 2012 and ORG Geophysical AS, 2014 - 6 REFERENCE - see Fig. 3.3). A strong Induced Polarization (IP) anomaly was observed over the Ula Field and the Butch Discovery (8/10-4 S). In August 2013 a new DNME survey was acquired with lines crossing the Etta Prospect. The expectation from these lines was to see the same anomaly if a hydrocarbon bearing reservoir is present in Etta. From this dataset one DNME line ties the Storebjørn structure (well 7/12-13 S) to Etta (see Fig. 3.3). The line has been processed and used in Centrica`s internal evaluation of Etta. This result has not been a part of the license's common database as not all the partners in PL668 have access to this DNME line.

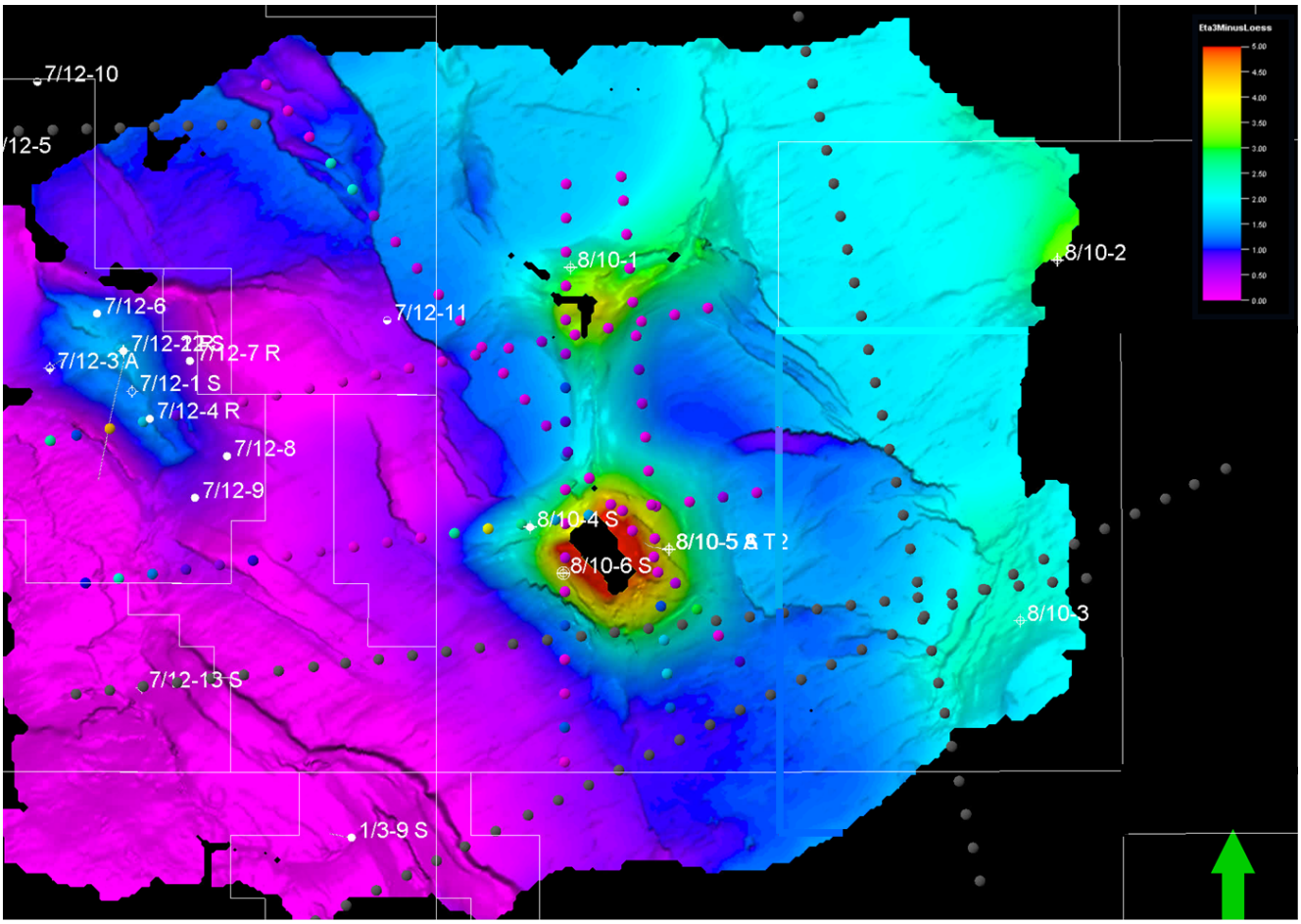

Fig. 3.3 ORG Geophysical DNME lines in the Greater Butch Area. *The colored dotted lines are DNME lines part of the common database in the Greater Butch Area licenses, also PL668.*

The grey dotted lines have been processed in-house in Centrica and are used in Centrica's internal evaluation of PL668 Etta Prospect. These lines are not part of the common database in PL668.

Geological and Geophysical Studies

In collaboration with a number of licenses in the vicinity facing similar challenges and drill or drop deadlines (Centrica operated: PL405, PL666, PL729, PL731 and Faroe Petroleum Norge AS operated: PL665 S), several G&G studies has been undertaken as part of the Etta evaluation. See Fig. 2.1 for an overview of the database utilized.

Biostrat (Geolink, Ichron)

Geolink has built on the existing PL405 2012 Geolink study (Geolink, 2012 - 6 REFERENCE) and updated the study of biostratigraphy and age dating with 27 additional selected wells (Geolink, 2014 - 6 REFERENCE). This was undertaken in license PL665 S where the biostratigraphical analysis of cuttings, core, review of historical data generation of stratigraphical framework for age determination was the aim of the study. The updated Geolink study is a part of the PL668 common database. The conclusion from this updated Geolink study is that there is evidence of a high amount of Late Jurassic sand input along the Ula-Gyda Trend as seen in the wells. The study also concludes that it is likely that some Ula Fm sandstone of upper flow regime tidal sand flat and tidal channels is present. Etta sits in vicinity of deeper salt collapse features which is in good position for creation of accommodation space.

The license partners also have access to a study preformed by Ichron (Ichron, 2015 - 6 REFERENCE) with similar conclusions as the Geolink study, but this report is not described here in any detail as it is not a part of the PL668 common database.

Pressures (Ikon)

As an extension of a pressure study from 2007 (Ikon GeoPressure, 2007 - 6 REFERENCE), Ikon has updated the study with additionally 12 wells (Ikon GeoPressure, 2014 - 6 REFERENCE, Fig. 2.1). This update was undertaken in PL665 S and the objective of this study was to evaluate regional pressure distribution, identify pressure barriers and assess possibility for hydrodynamic trapping mechanisms in the Greater Butch Area. The study is still ongoing and will be continued through license PL665 S. The preliminary conclusion is that there is strong evidence for hydrodynamic flow and in general the Jurassic reservoirs are depleted presumably due to lateral drainage, relative to adjacent Jurassic reservoirs to the south of the study area.

Fluid Inclusion (Karlsen Keros Consulting AS)

Karlsen Keros Consulting AS (Karlsen Keros) has analysed two core plugs from the dry well 7/12-13 S (Storebjørn Prospect) directly to the west from Etta (Karlsen Keros, 2014 - 6 REFERENCE). The reservoir section where the two core plugs are sampled from has contained oil (fluorescent inclusions were found present). The inclusions are of the general Ula Field type, but there is also signs of highly mature gas in the samples, and this could reflect access to a highly mature and very deep source kitchen. The conclusion from the core plug fluid inclusion study is that the 7/12-13 S core plugs show signs of highly mature gas in the samples, and this could reflect access to a highly mature and very deep source kitchen.

Karlsen Keros Consulting AS (Dag Karlsen) has also through PL665 S (also including PL666 and PL668) made a fluid inclusion study where the aim was to present a feasible model to explain why the traps in the Greater Butch Area region (extended south-eastward up on the Sørvestlandet High) have leaked oil (Karlsen Keros, 2014 - 6 REFERENCE). The motivation was to outline some detail about the API and GOR of the long lost oils. Furthermore, the maturity and the facies of the residual oil were interpreted within the context of the Ula and Gyda Fields. Attempts were also made at interpreting the migration regime and "trapping style" of the region using petroleum in traps as "proof of the pudding" as to what did really occur in these petroleum systems, down-dip of the traps, in the past, recent and present time. The broad conclusion from Dag Karlsen is that most of the "dry wells" may technically correctly have been classified as "dry". It is in terms of the petroleum system understanding crucial to examine "dry" wells with paleo-oil columns to gain an understanding of the "petroleum machinery" and the migration patterns in this region represented by the dry wells. This understanding is a key feature for improved exploration and enhancing the understanding of petroleum migration patterns in regions, thus helping to

improve the change of future oil discoveries. It is also important to establish whether or not the gas in the paleo-traps represented by these dry wells at some time in the past was either a dry gas, wet gas, condensate associated gas or even oil associated. This is done by examining of the gas liberated from inclusions in quartz overgrowths.

Petroleum System (Torena AS)

A semi regional hydrocarbon system study has been conducted by Torena AS (Torena) in the Greater Butch Area (Torena AS, 2015 - 6 REFERENCE). The aim of the Torena study was to identify mature basins and possible migration routes into the identified prospects in the Greater Butch Area. Fig. 3.4 shows the drainage areas and the migration trends in the Greater Butch Area. Torena indicates that the Etta Prospect has potential for significant hydrocarbon charge dominated by oil. Moderate GOR oil is to be expected in Etta. However, the migration effectiveness to charge Etta could be questionable. The migration route from deeper basins to the west could be deflecting and by-passing the route to feed Etta, but close proximity to mature kitchen areas is still promising.

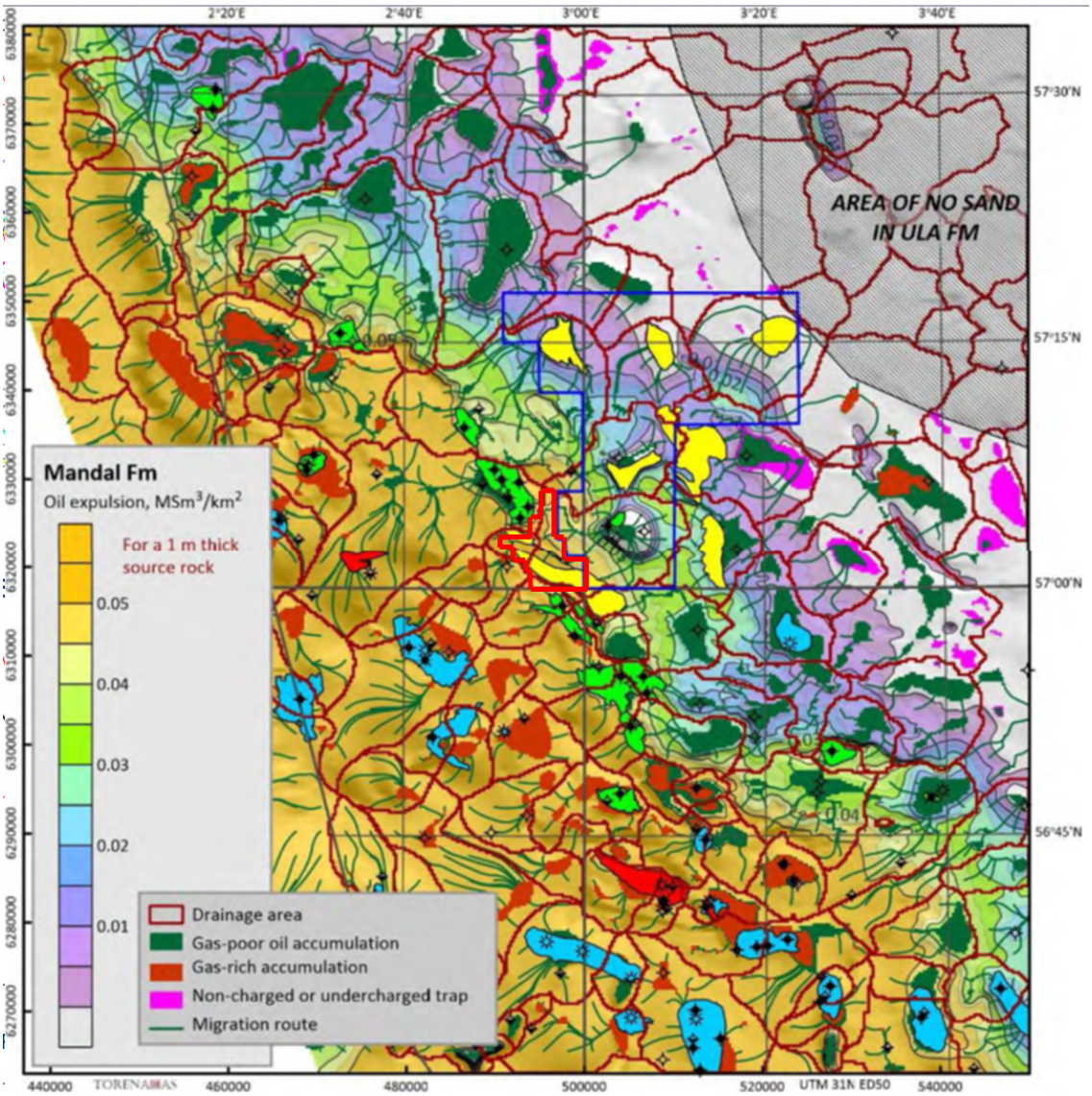

Fig. 3.4 Torena AS - Drainage areas. *Migration trends at present assuming there is a continuous carrier bed at Base Cretaceous Unconformity (except in the North-East corner of the map). The background map shows oil expulsion up to present for a 1m thick Mandal FM all over. Also shown are non-charged traps, possibly charged traps, possibly charged migration routes and drainage areas for all traps. Red outline in the middle of the figure defines PL668.*

CE1202 Seismic Inversion Study (Qeye)

Qeye Labs ApS (Qeye) has made an inversion study using the CE1202 PSDM pre-stack migrated NMO corrected seismic gathers in TWT domain with a variety of output volumes including AI, SI, Vp/Vs and fluid/lithology prediction cubes (Qeye Labs, 2014 - 6 REFERENCE). The primary objective of the inversion project was to deliver quantitative interpretation results to determine the presence of the Ula Fm sand within the licenses and if possible identify hydrocarbon presence. The 8/10-4 S Butch Discovery, in license PL405, is used as calibration for hydrocarbon presence. The seismic inversion study result suggest the presence of sand down flank in Etta. The Qeye dataset is included in the database for PL668.

4 PROSPECT UPDATE

The Etta Prospect was the main prospect identified for the APA 2012 application. The second identified prospect called Gang is after award located outside the PL668 outline (see 1 KEY LICENSE HISTORY).

In the application, Etta was mapped as a three-way dip closure with a fault seal up towards the Ula Field. The structural definition was made on Top Mandal Fm level as the top reservoir Ula Fm reflector was poorly imaged on the seismic data covering the area. The thickness of Ula Fm was thought to be greater over the Etta salt ridge collapse in a classic pod-intrapod setting created by movement of the underlying Zechstein salt. Etta was seen to be bounded by faults to the north and north-west and with a side seal mainly Farsund Fm shales. Mandal and Farsund Fms make up the vertical seal. Source rock in the area are shales of Mandal and Farsund Fms in several potential kitchen areas.

Trap and Seal

The prospect maturation of Etta was done on the 2012 vintage 3D seismic CE1202. The final data set making up the complete CE1202 3D seismic still has issues related to the imaging of the Ula Fm sand (multiple contamination), so structural definition of Etta is made on the interpretation of the Mandal and Farsund Fm shales. Seal is provided by the regional extensive Mandal and Rødby Fms, and is considered to be very robust.

Reservoir

The primary reservoir in and around Etta is the Upper Jurassic Ula Fm sandstone. This is predominantly a near-shore marine sandstone deposited in shallow water depths. It is widespread in the Central Graben area and proven oil bearing in the Ula, Gyda and Tambar Fields (see 6 REFERENCE Geolink for a detailed description of the biostratigraphical interpretation of the Greater Butch Area).

The facies distribution is controlled by the extensional faulting and the salt movement causing relative sea level and coastline variations in the Greater Butch Area. In the central Ula area, the sandstone is somewhat heterogeneous with the best parts having high net-to-gross and good porosity.

The sand in the area of Etta is trapped structurally where the Late Jurassic syn-depositional extensional faulting forms grabens or half-grabens, and also where the salt bodies collapse/are dissolved giving space for deposition of sediments from the neighboring Triassic pods (see Fig. 4.1 for a Greater Butch Area Pod-Interpod map). 6 REFERENCE Geolink confirms that the moving coastline together with the extensional tectonics have acted as the main controlling factors on the depositional pattern with salt tectonics playing an important role on a more local scale. This model predicts the sand to be distributed in a wider area not just above the collapsed salt structures, but also across the Triassic pods between the salt highs. Late Jurassic faulting within or along the margins of the Triassic pods have created depocentres for significant sand accumulations. In addition, salt movement has been essential in creating accommodation space for sediments in the areas where the salt has been uplifted and dissolved thereby creating local collapse grabens that have acted as depocenters for the Upper Jurassic sandstone. This is one of the controlling mechanisms for the trapping of the Ula Fm reservoir sands in Etta.

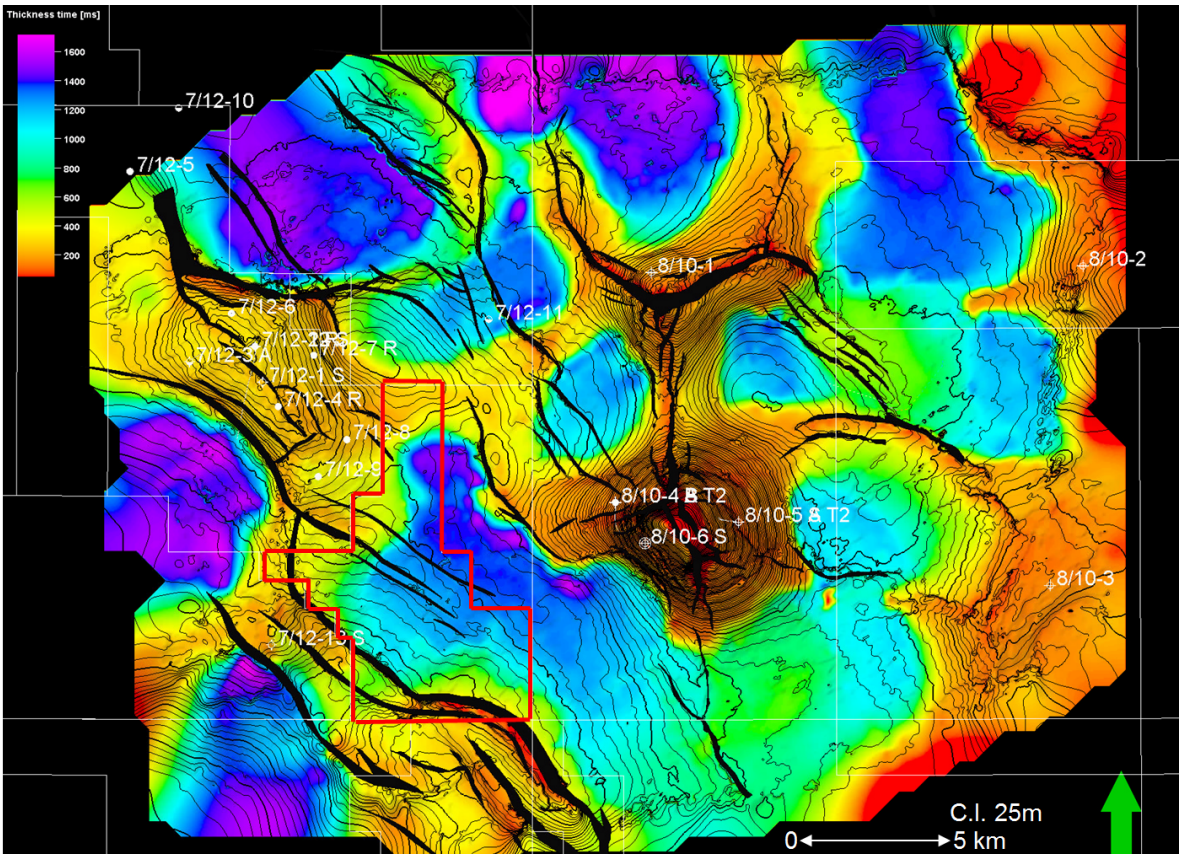

Fig. 4.1 Greater Butch Area BCU-Top salt Pod-Interpod map. *The map visualizes the accommodation space available for strata deposited on top of the salt in the Greater Butch Area. PL668 is highlighted in red. Mapping performed on 3D CE1202.*

Based on the structural expression of the Etta, the local salt collapse trap may have been followed by uplift with resulting erosion of crestal strata. The following seismic images give an overview of the possible erosion observed:

Etta Prospect - crestal erosion: Fig. 4.2

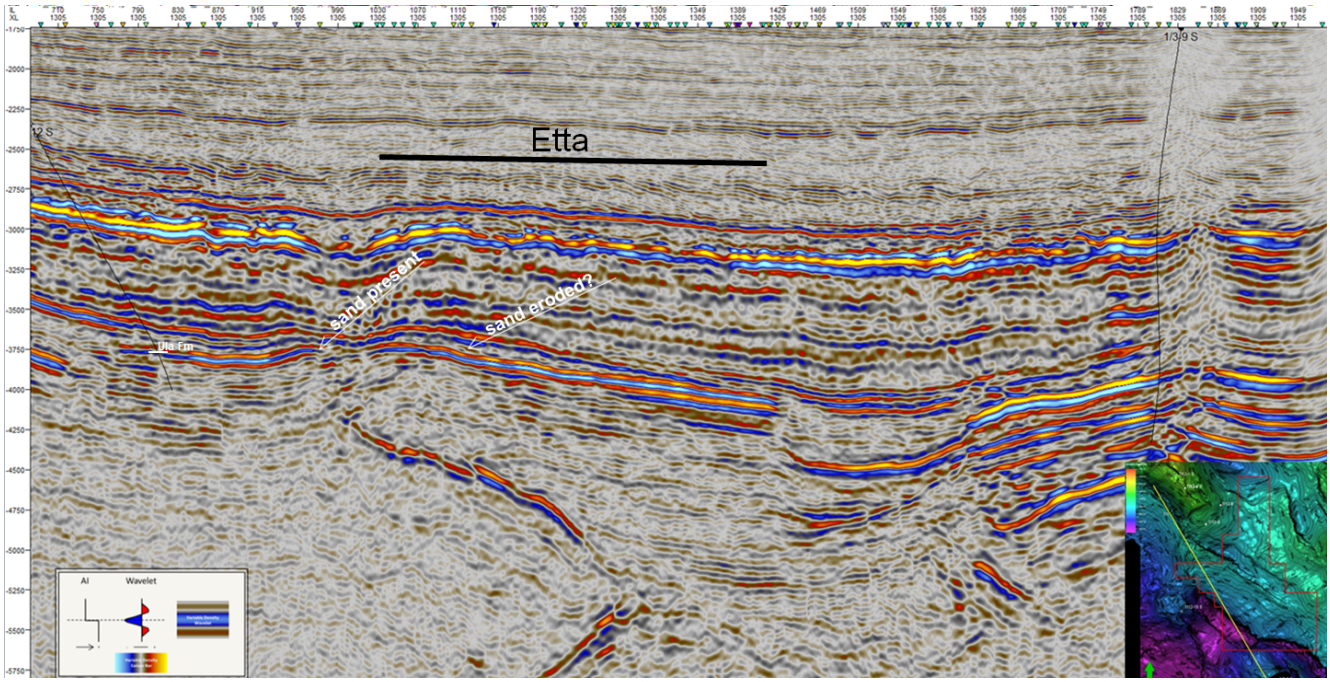

Fig. 4.2 Etta Prospect erosion?. *Seismic indications of erosion of reservoir sand from crestal parts of Etta.*

Etta Prospect - thickening of Upper Jurassic strata down-flank: Fig. 4.3

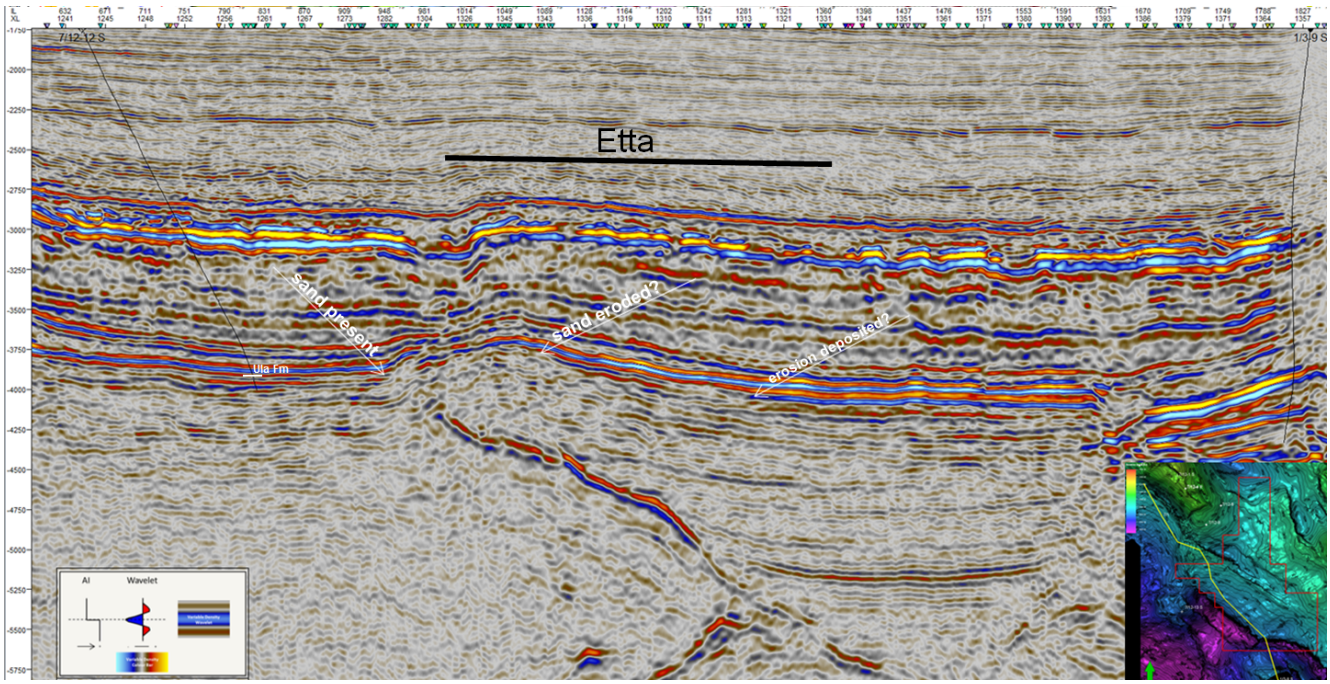

Fig. 4.3 Etta Prospect; erosion on the crest of the structure? Thicker Upper Jurassic strata down-flank. *Seismic indications of possible eroded reservoir sand from crestal part of Etta being deposited down the flank of the structure.*

Etta Prospect - thin reservoir sediments remaining on the crest: Fig. 4.4

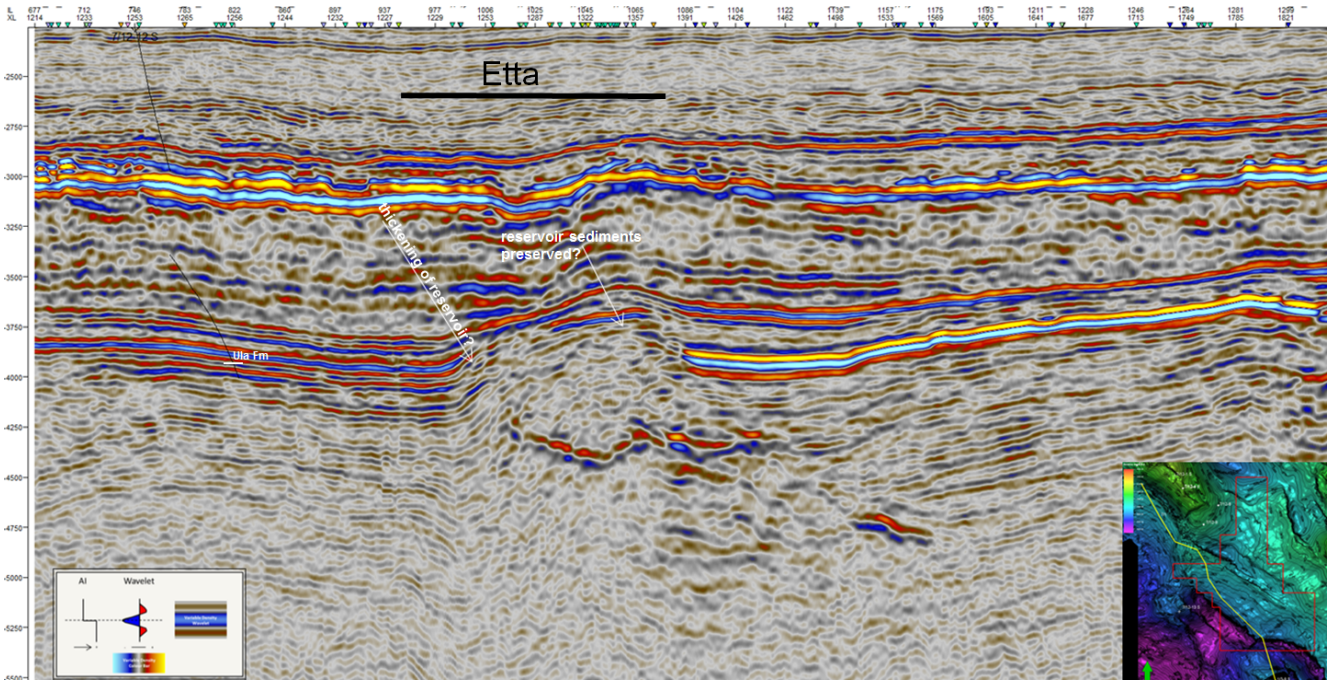

Fig. 4.4 Etta Prospect; thin reservoir on the crest?. *Seismic signature indicates that there is some preservation of reservoir sediments in some parts of crestal Etta.*

Etta Prospect - erosion and re-deposition: Fig. 4.5

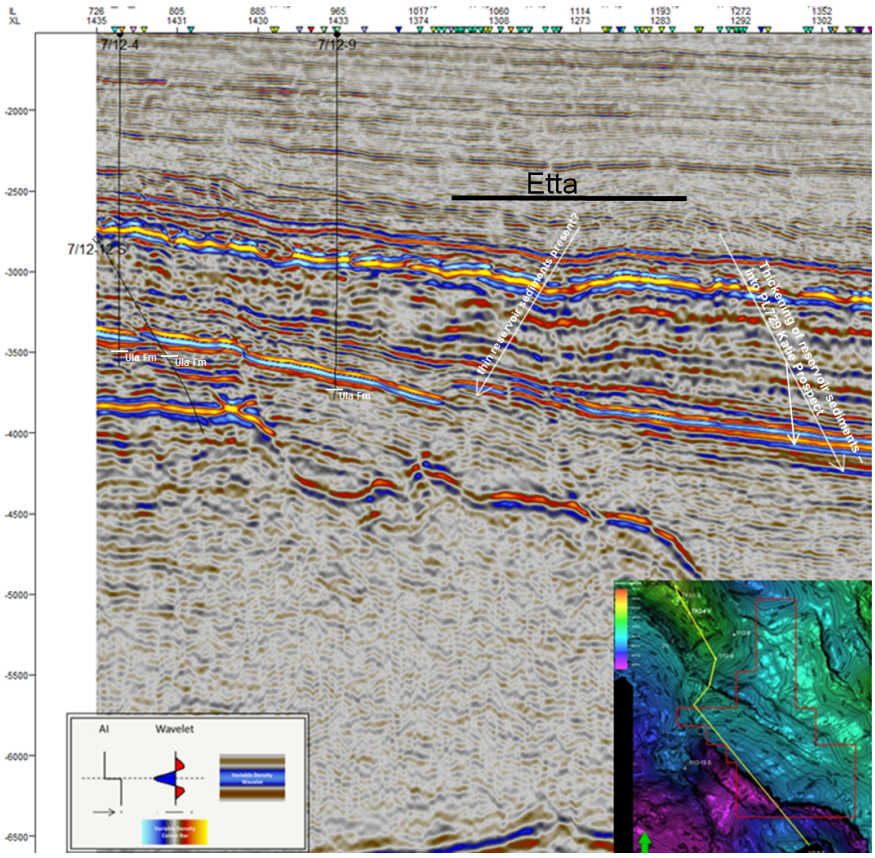

Fig. 4.5 Etta Prospect; erosion and re-deposition?. *Some seismic indication of thicker reservoir sediments present down-flank of Etta. The erosional material from Etta crest could be connected to PL729 Katie Prospect.*

Based on the above seismic interpretation, it is likely that some of the crestal Upper Jurassic sands are eroded and deposited down the flank of the Etta structure. Down-flank of Etta there are some evidence (seismic amplitude anomalies - see 6 REFERENCE QEye) of reservoir sand response. These seismic amplitude anomalies are partly sitting within the PL668 license, but they are also connected to the Katie Prospect in PL729, where the extension of the anomaly (reservoir sand) is sitting in PL729.

Hence, due to the above shown potential lack of good reservoir section remaining in the crestal part of the structure defining the Etta Prospect, the evaluation has concluded that Etta is eroded on the top of the structure. These erosion products are in fact deposited down-flank and are a actually part of Katie Prospect in PL729. Etta therefore no longer exist as a prospect in PL668.

Source and Migration

The Torena Study (described in 3 REVIEW OF GEOLOGICAL FRAMEWORK) confirms that Etta have potential for significant hydrocarbon charge, dominated by oil. Moderate GOR oil is to be expected and the charge potential for Etta seems to be better than for the proven 8/10-4 S Butch Discovery. The mature drainage area for Etta is shown in Fig. 3.7. However, the migration effectiveness to charge Etta could be questionable. The migration route from deeper basins to the west could be deflecting and by-passing the route to feed Etta, but close proximity to mature kitchen areas is still promising.

Risking and Uncertainty

As the conclusion for the Etta Prospect is that this prospect is a part of the PL729 Katie Prospect, the risking and uncertainty evaluation is no longer applicable.

Volumetrics

As the conclusion for the Etta Prospect is that this prospect is a part of the PL729 Katie Prospect, the risking and uncertainty evaluation is no longer applicable.

The updated NPD Table 5: Prospect Data is included here Fig. 4.6.

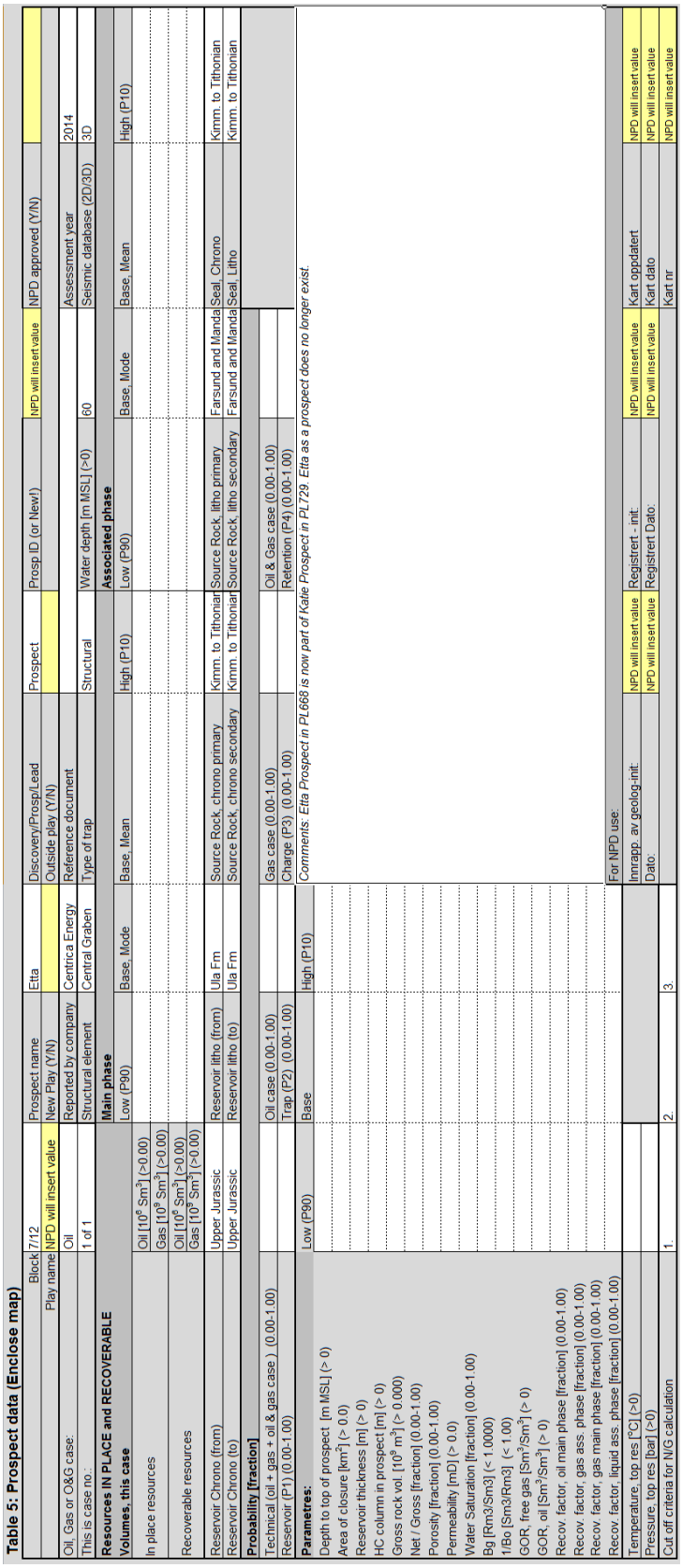

Table 5: Prospect data (Enclose map)									
Block 7/12	Prospect name	Etta	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)		
Play name	New Play (Y/N)		Outside play (Y/N)						
Oil, Gas or O&G case:	Oil	Reported by company	Centrica Energy	Reference document			Assessment year	2014	
This is case no.:	1 of 1	Structural element	Central Graben	Type of trap	Structural	Water depth [m MSL] (>0)	60	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)	
In place resources	Oil [10^6 Sm^3] (>0.00)								
	Gas [10^9 Sm^3] (<0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)								
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Upper Jurassic	Reservoir litho (from)	Ula Fm	Source Rock, chrono primary	Kimm. to Tithonian	Source Rock, litho primary	Farsund and Manda	Seal, Chrono	Kimm. to Tithonian
Reservoir Chrono (to)	Upper Jurassic	Reservoir litho (to)	Ula Fm	Source Rock, chrono secondary	Kimm. to Tithonian	Source Rock, litho secondary	Farsund and Manda	Seal, Litho	Kimm. to Tithonian
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)		Oil case (0.00-1.00)		Gas case (0.00-1.00)		Oil & Gas case (0.00-1.00)			
Reservoir (P1) (0.00-1.00)		Trap (P2) (0.00-1.00)		Charge (P3) (0.00-1.00)		Retention (P4) (0.00-1.00)			
Parametres:		Low (P90)	Base	High (P10)	*Comments: Etta Prospect in PL668 is now part of Kalle Prospect in PL729. Etta as a prospect does no longer exist.*				
Depth to top of prospect [m MSL] (> 0)									
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)									
Net / Gross [fraction] (0.00-1.00)									
Porosity [fraction] (0.00-1.00)									
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)									
Bg [Rm3/Sm3] (< 1.0000)									
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)									
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)					For NPD use:				
Temperature, top res [°C] (≥0)					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)					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

Fig. 4.6 PL668 Etta Prospect updated NPD Talbe 5 Prospect Data

5 CONCLUSIONS

Etta was the main prospect identified by the partnership for the APA 2012 application round in block 7/12. 4 PROSPECT UPDATE shows that Etta prospectivity is considered to be limited:

- Etta structure salt collapse may have been followed by uplift again followed by erosion of crestal strata.
- Etta structure with potentially some Upper Jurassic sandstone on the crest of the structure, but erosion has removed most of the prospective reservoir strata from crestal parts of Etta.
- More Upper Jurassic sediments are believed to be found down the flank of Etta into PL729 as part of this license's Katie Prospect.
- Down flank sediments with an amplitude anomaly is what today makes up the Katie Prospect only partly sitting within the PL668 license and mostly sitting within the PL729 license.

For the above described reasons, is was decided by the PL668 partners to relinquish the license to the authorities on the date of expiry of the initial period (8 February 2015).

6 REFERENCE

ORG Geophysical AS, 2012 - DNME Survey Report ORG1201-2

ORG Geophysical AS, 2014 - DNME Survey Report ORG1302

Ikon GeoPressure, 2007 - Butch Cassidy Study. A hydrodynamic study of the Norwegian blocks 1&2 in the East of the CNC

Geolink, 2012 - PL405 The Ula Trend - Regional Stratigraphic Correlation and Depositional Environments. Proprietary license report

Geolink, 2014 - The Ula Trend

APA2012 - Application for Production License - Block 7/12 (Partnership APA document)

Ikon GeoPressure, 2014 - Semi-Regional Pore Pressure Study of the PL668, PL666 and PL665S Blocks Study in the Central North Sea

Karlsen Keros Consulting, 2014 - Report of core extracts and fluid inclusions in some dry wells from the Greater Ula Region and the more proximal acreage. 7/12-13 S Storebjørn and the PL668 Etta Prospect - Towards a tentative petroleum system model for the Greater Ula Region, May 2014

Karlsen Keros Consulting, 2014 - REPORT ON CORE EXTRACTS AND FLUID INCLUSIONS IN SOME DRY WELLS FROM THE GREATER ULA REGION AND THE MORE PROXIMAL ACERAGE. TOWARDS A TENTATIV PETROLEUM SYSTEM MODEL FOR THE GREATER ULA REGION

Qeye Labs, 2014 - Centrica Energi Butch - 3D seismic simultaneous AVO and rock physics inversion. Results of a 3D seismic simultaneous AVO inversion, rock physics modeling and inversion of data covering the production licenses PL405, PL666, PL668, PL729 and PL731. This project is requested by Centrica Energi and carried out by Qeye Labs

Ichron, 2015 - Core description, depositional modeling and gross depositional environment mapping of the Butch Discovery (PL405) and adjacent blocks. A sedimentology, depositional modelling and gross depositional environment (GDE) mapping study on wells located adjacent to the Butch prospect

Karlsen Keros Consulting, 2015 - CORE EXTRACTS & FLUID INCLUSIONS FROM WELL 8/10-4 S BUTCH & THE DRY WELL 8/10-5 S. Was there ever oil in the dry well 8/10-5 S? How does the data from 8/10-4 S fit in with the findings from 8/10-5 S and the petroleum systems of the region?

Torena AS, 2015 - PL668, PL666, PL731, PL729 - Petroleum system analysis of PL405/405 B and adjacent areas in the Norwegian Central Graben. Petroleum system analysis of PL405/405B and nearby adjacent areas on the eastern flank of the Norwegian Central Graben