PL688 Relinquishment Report

Fig. 1

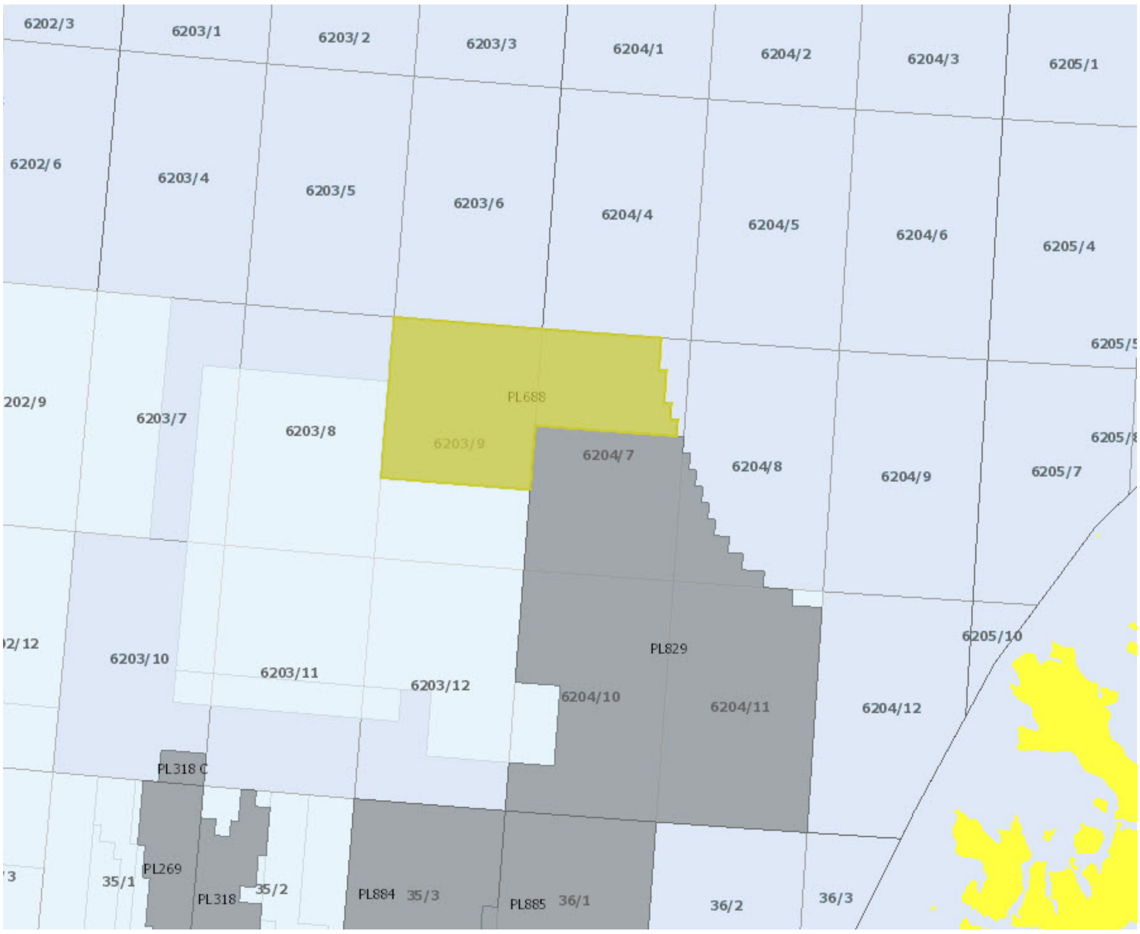

Fig. 1 License Area Map

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1 Key Licence History

License PL688 is located on the western edge of the Slørebotn Sub-Basin, east of the Møre Basin and approximately 70km west of the Norwegian coast (Fig. 1.1). The license was awarded in February 2013 (APA 2012) to E.ON E&P Norge AS, now DEA Norge AS, with BG Norge AS (now Norske Shell) as partner. The partnership's equity distribution is as follows: DEA Norge AS is Operator with 50%, Norske Shell is partner with 50%. The main focus has been to evaluate the Jurassic prospectivity.

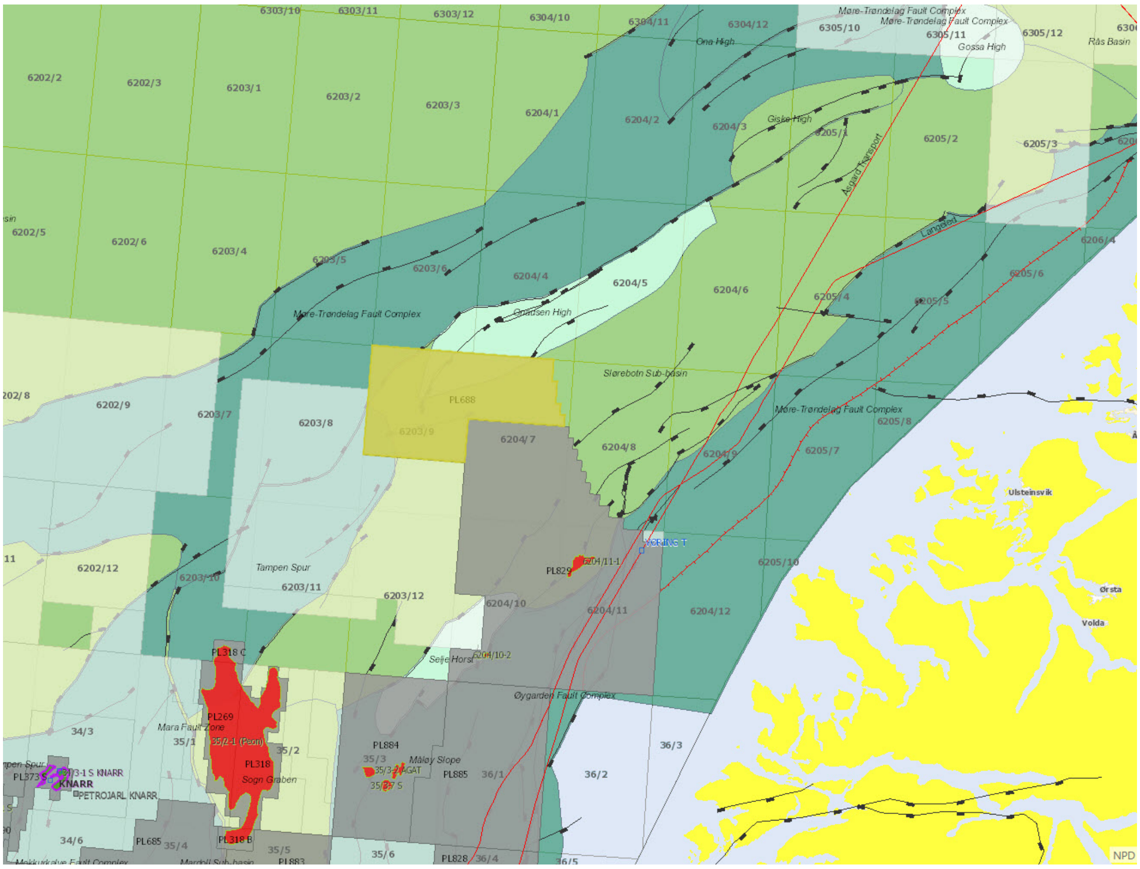


Fig. 1.1 Regional location of PL688

The voting rules are:

- Decisions require a minimum of 2 companies and at least 50% equity.
- Relinquishment of part or whole of the license requires unanimity.

DEA Norge, as operator of PL688, and its partner Norske Shell have decided to relinquish the license before the DoD deadline 08.08.2017.

Initial work obligations and work periods

Table 1.1 Initial work obligations and work periods

Within 3 years from award (by 08.02.2016)	Within 6 years from the award (by 08.02.2019)	Within 8 years from the award (by 08.02.2021)	Within 9 years from the award (by 08.02.2022)
• Acquire 2D and 3D seismic data over the prospective area. • Perform relevant geological and geophysical studies. • Drill or Drop.	• Drill exploration well. • BoK or Drop.	• Conceptual studies. • BoV or drop.	• Prepare development plan • PDO or drop.

In October, 2015, on behalf of the partnership, DEA Norge applied for, and was granted, an 18-month extension of the first phase. The reason for the extension was to complete the 3D Prestack Depth Migration and evaluate HPHT drilling risks associated with the prospects. The revised deadline for Drill or Drop is 08.08.2017.

Overview of meetings held
The table below contains the list of meetings held during the license period:

Table 1.2 Overview of held meetings

Combined EC/ MC #1 12/03/2013	Established the licence, built the common database, discussed plans for 3D seismic, shared the views on prospectivity, budget and work program for 2013.
Combined EC/ MC #2 07/11/2013	Status of the the geological and peophysical work including the seismic data acquisition and processing. Budget and work program for 2014
Combined EC/ MC #3 04/11/2014	Status of seismic time processing and special studies. Budget and work program for 2015.
Combined EC/ MC #4 27/11/2015	Status of seismic interpretation, special studies and preliminary volumetrics. Budget and work program for 2016. Application for extension of initial phase (DoD) by 18 months
Combined EC/ MC #5 17/11/2016	Status of seismic depth processing, seismic interpretation and special studies. Budget and work program for 2017.
Combined EC/ MC #6 22/06/2017	Presented volumes and final risking, upside potential and discussed budget and work program, the operator proposed to relinquish the license.

Reasons for relinquishment
The main prospect in the license is the Ritland prospect. It has been thoroughly evaluated and it has been concluded that the partnership deems the prospect to have geological high risk (17%) with medium reward resources (26 Mean mmSm^{3}oe recoverable gas resources). The partnership considers the Play to be proven.

At the prospect level the main risks are:

- Prospect reservoir presence / preservation (0.5): Challenging to map specific reservoir formation due to well proximity and depth of structure.
- Prospect trap validity/retention of charge (0.6): Robust 4-way dip structure but could be compromised by blown seal due to high pressure.
- Reservoir quality (0.7): Fair chance of poor reservoir quality due to depth.
- Access to charge (0.8): Large kitchen with good mature source rock surrounds Ritland.

Overall Possibility of Finding Hydrocarbons: 17%.

The operator's Minimum Economic Field Size (MEFS) for this area is estimated to be 21.9 Mean mmSm^{3}oe with a small TLP, two subsea templates and a leased storage tanker. The Ritland prospect's Mean recoverable resources is estimated to be 26 Mean mmSm3oe. This yields a low Chance of Commercial Success of 8%. This Chance of Commercial Success is considered by the partnership to be too low to justify exploration drilling.

The partnership has therefore agreed to drop the license.

2 Database

2.1 Well Database

The common well database contain wells that have penetrated the Middle and Lower Jurassic reservoir sections and the Upper Jurassic source/seal sections at depths greater than 4km. Most of the wells have been drilled far from the PL688 license. Hence the wells in the common well database are primarily to the south and in the north (Fig. 2.1 and Table 2.1). There are no proximal analogous wells. The Knarr and Kristin fields and Lavrans and Linnorm discovery wells have been used for reservoir parameters. Wells to the southwest, east and northeast (Gossa High) have been used for structural interpretation analogues and seismic tie of the overburden.

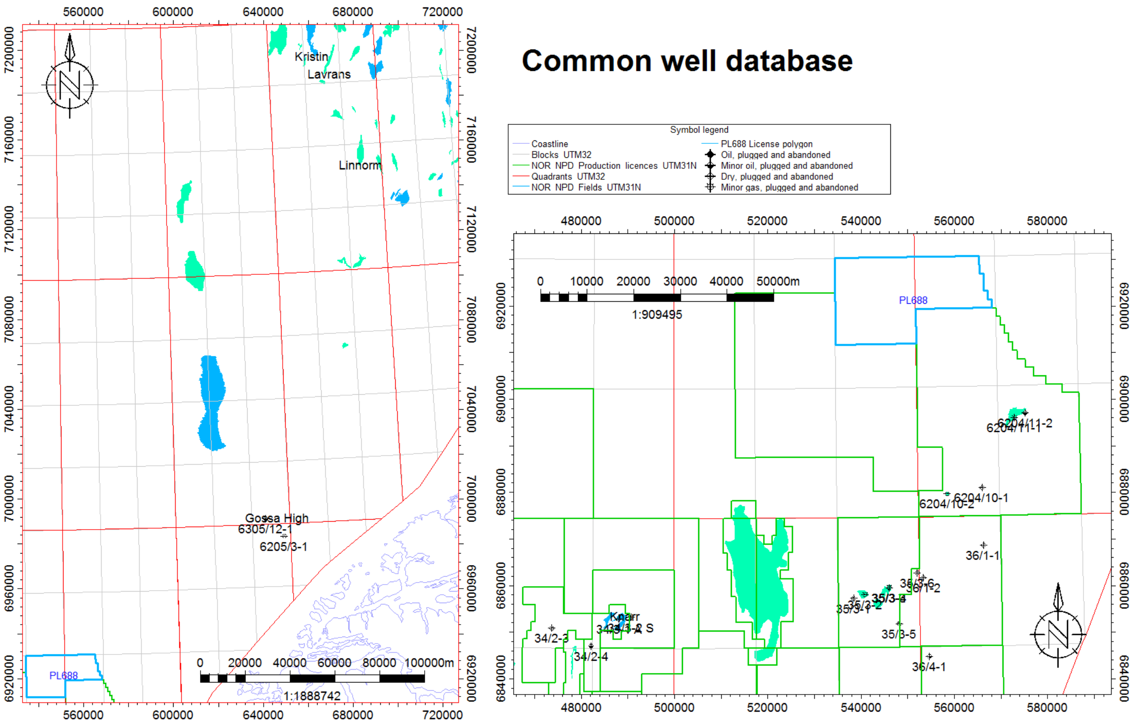


Fig. 2.1 Database overview map

Table 2.1 PL688 Common well database

Name	Content	Completion date	License	Total depth (mRKB)	Oldest penetrated age	Oldest penetrated formation
34/2-3	SHOWS	13.08.1981	056	3741	LATE TRIASSIC	LUNDE FM
34/2-4	OIL SHOWS	11.06.1985	056	4107	EARLY JURASSIC	STATFJORD FM
34/3-1	OIL	10.09.2008	373S	4221	LATE TRIASSIC	STATFJORD FM
34/3-2S	SHOWS	30.12.2009	373S	4331	TRIASSIC	STATFJORD FM
35/3-1	DRY	26.10.1976	041	4475	MIDDLE JURASSIC	DRAKE FM
35/3-2	GAS/ CONDENSATE	26.10.1980	041	4400	PRE-DEVONIAN	BASEMENT

Name	Content	Completion date	License	Total depth (mRKB)	Oldest penetrated age	Oldest penetrated formation
35/3-3	DRY (JUNKED)	28.11.1980	041	900	OLIGOCENE	HORDALAND GP
35/3-4	GAS/ CONDENSATE	06.06.1981	041	4089	PRE-DEVONIAN	BASEMENT
35/3-5	DRY	31.03.1982	041	4114	PRE-DEVONIAN	BASEMENT
35/3-6	DRY	02.04.2002	270	3366	LATE JURASSIC	HEATHER FM
36/1-1	DRY	14.06.1975	042	1596	PRE-DEVONIAN	BASEMENT
36/1-2	SHOWS	27.10.1975	042	3256	PRE-DEVONIAN	BASEMENT
36/4-1	DRY	01.10.1996	196	2717	PRE-DEVONIAN	BASEMENT
6204/10-1	DRY	23.11.1995	175	2709	PRE-DEVONIAN	BASEMENT
6204/10-2R	GAS	21.11.1997	157	2095	PRE-DEVONIAN	BASEMENT
6204/11-1	GAS	14.11.1994	175	2966	TRIASSIC	GREY BEDS
6204/11-2	OIL SHOWS	28.12.1997	175	2920	LATE JURASSIC	SOGNEFJORD FM
6205/3-1	DRY	11.01.1990	154	4300	EARLY CRETACEOUS	ÅSGARD FM
6205/3-1R	SHOWS	30.11.1990	154	5264	LATE JURASSIC	SPEKK FM
6305/12-1	SHOWS	18.09.1991	154	4302	LATE TRIASSIC	RED BEDS

2.2 Seismic Database

Mapping of the prospects in PL688 was based on the EO13003 (NPDID:7855) data set. EO13003 was acquired in 2013 by the partnership, time processing finished in 2014 and depth processing was completed in 2016. No well tie was possible within the EO13003 survey boundary, while 2D lines and vintage 3D were used to tie the main seismic events. Numerous 2D surveys were also utilized for regional interpretation and special studies (basin modeling, gravity/magnetic modeling and effective pore pressure estimation from seismic)Fig. 2.2 . Table 2.2 provides the overview of the seismic data.

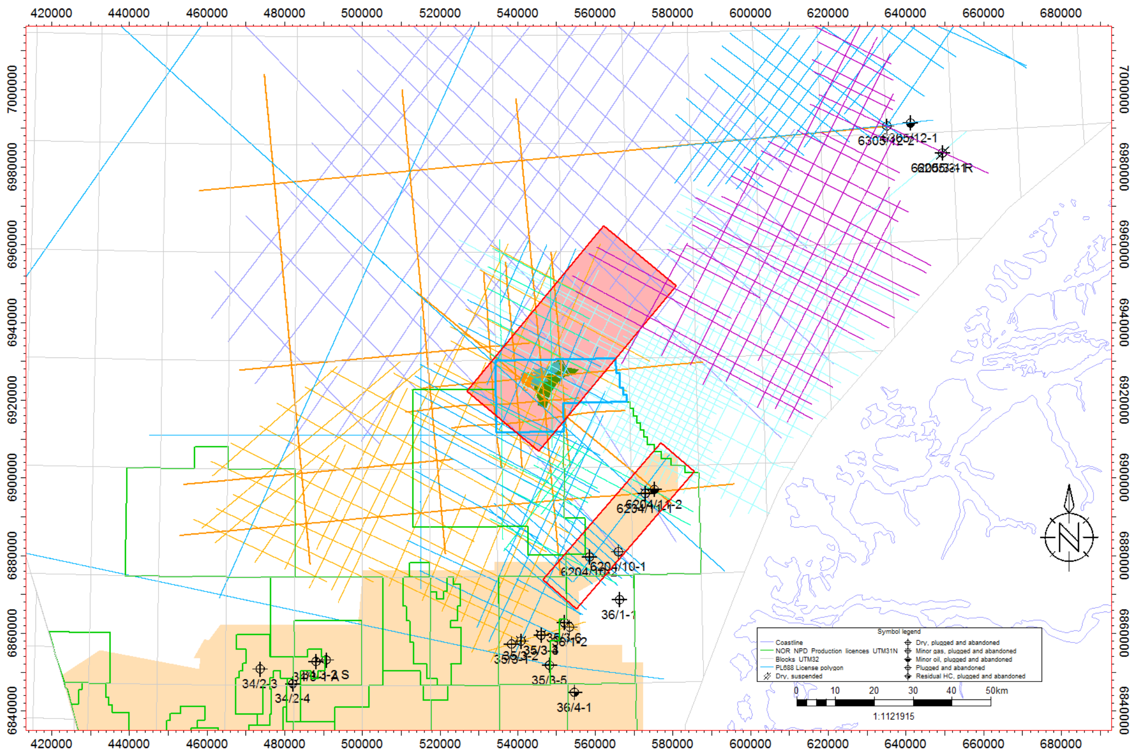


Fig. 2.2 PL688 Seismic database

Table 2.2 PL688 seismic database

Survey / Line	Type	Quality	Public	Year	Comments
ST8404 / all	2D	POOR	YES	1984	FINAL MIGRATION
ST8503 / all	2D	POOR	YES	1985	FINAL MIGRATION
ST8504 / all	2D	POOR	YES	1985	FINAL MIGRATION
GMSI-91 / all	2D	FAIR	YES	1991	FINAL MIGRATION
MN9106 / all	2D	FAIR	YES	1991	FINAL MIGRATION
SG9009 / all	2D	FAIR	YES	1991	FINAL MIGRATION
SG9113 / all	2D	FAIR	YES	1991	FINAL MIGRATION
GMN94 / all	2D	FAIR	YES	1994	FINAL MIGRATION
WGS96GNH / all	2D	FAIR	YES	1996	FINAL MIGRATION
GOM-95 / all	2D	FAIR	YES	1995	FINAL MIGRATION
MM95 / all	2D	FAIR	YES	1995	FINAL MIGRATION
MNR06 / 237	2D	GOOD	NO	2006	SP 999-5923
MNR06 / 6952	2D	GOOD	NO	2006	SP 555-8964
MNR06 / 6992	2D	GOOD	NO	2006	SP 6131-13249
MNR08 / 173	2D	GOOD	NO	2008	SP 1341-6417
MNR08 / 208A	2D	GOOD	NO	2008	SP 1317-6122
MNR08, MNR09 / 6904	2D	GOOD	NO	2008, 2009	SP 5601-11437
MNR08 / 6917	2D	GOOD	NO	2008	SP 5697-8501
MNR08 / 6936	2D	GOOD	NO	2008	SP 8239-11138

Survey / Line	Type	Quality	Public	Year	Comments
MNR08 / 6945	2D	GOOD	NO	2008	SP 6380-9380
MNR08 / 6962	2D	GOOD	NO	2008	SP 5210-9923
MNR08 / 6984	2D	GOOD	NO	2008	SP 4802-6125
MNR09 / 224	2D	GOOD	NO	2009	SP 2138-4178
MNR09 / 230	2D	GOOD	NO	2009	SP 2122-4260
MNR09 / 242	2D	GOOD	NO	2009	SP 2083-4321
MNR09 / 6925	2D	GOOD	NO	2009	SP 8500-10302
MNR09 / 6930	2D	GOOD	NO	2009	SP 8039-9841
MNR11 / 90189B	2D	GOOD	NO	2011	SP 26760-30172
PGS MEGA-MERGE	3D	FAIR	NO		
ST9202	3D	FAIR	YES	1992	FINAL MIGRATION
EO13003	3D	GOOD	NO	2013	NPDID: 7855

Seismic data acquisition

The work program for PL688 included acquisition of both 2D and 3D seismic acquisition. In 2013, EO13003 (NPDID:7855) was acquired on behalf of PL688 by Dolphin Geophysical AS. The survey acreage (1281 km²) acquired exceeded the required area and this reduced the need for 2D data acquisition. See Fig. 2.3 for overview.

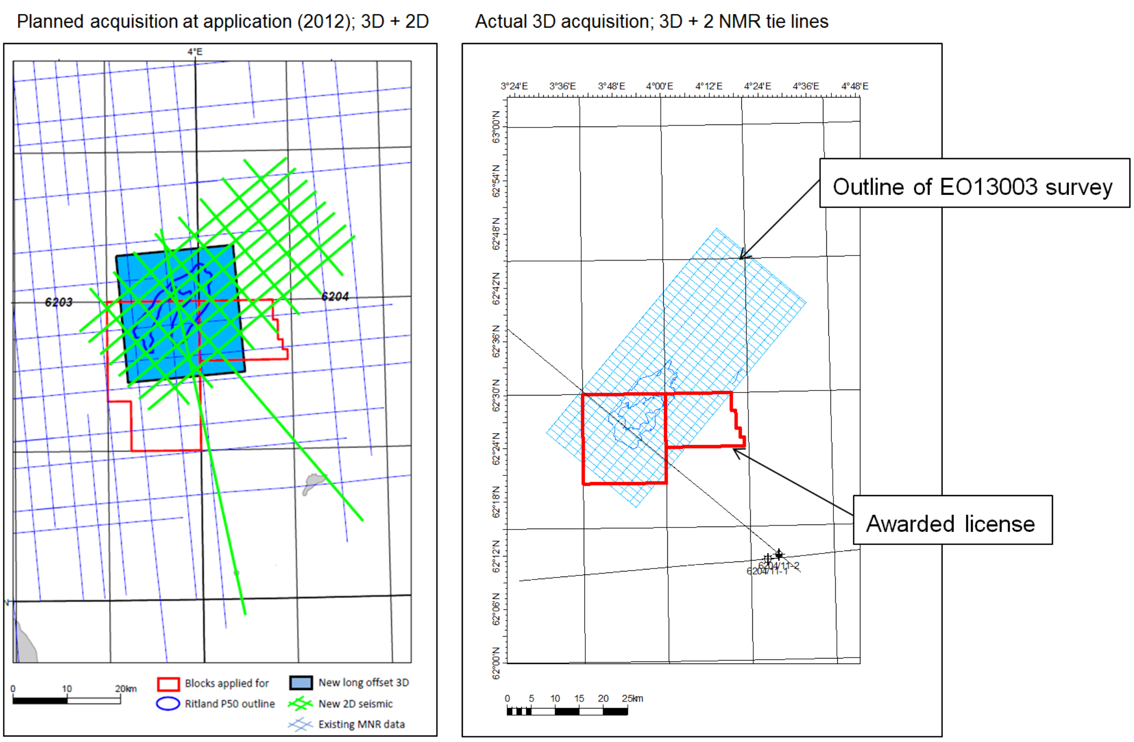


Fig. 2.3 Planned acquisition versus actual acquisition

3 Review of Geological and Geophysical Framework

Studies performed
The following geological and geophysical studies have been undertaken in connection with the license work and the preparation of the drill or drop decision.

Table 3.1 Special studies performed for the PL688 prospectivity evaluation

Year	Study name	Author
2013	Gravity/Magnetic feasibility study	ArkeX
2014	Structural evolution and reservoir development	DEA
2015/2016	Prestack depth migration processing and updated velocity model	DEA / CGG
2015/2016	Depth conversion uncertainty	DEA
2016	Basin modelling	DEA
2016	Pore pressure prediction from seismic data	IkonScience

A feasibility study was performed to evaluate whether an acquisition of full-tensor gravity data would assist in the seismic interpretation of basement over the license acreage. The partnership decided not to perform such an acquisition due low probability that full-tensor gravity measurements would have better resolution than marine based gravity measurements already available for the probable depth of basement over PL688. PL688 conducted a feasibility study to achieve higher level of detail and confidence of the magnetic basement structure at southern Gnaussen High using Full Tensor Gravity measurements. The outcome of the study showed minor uplift in confidence when compared to conventional seaborne gravity measurements at this target depth. Based on this, a 2D grav/mag modelling was performed to support interpretation of the deep Pre-Triassic and provide initial velocity information for the depth processing of the 3D seismic.

In 2014, a litterature study was performed to improve the understanding of the structural evolution and look for structural analogs in the area stretching from the Gossa High in the North, out to the Manet Ridge in the southwest and the Selje Horst in the south. PL688 is located far from the nearest calibration wells and situated on the border between the Northern North Sea and the Norwegian Sea. Consequently, semi-regional mapping of a larger area stretching from Gossa High in the north to Tampen Spur in the south was performed to calibrate the geological setting. Ritland is interpreted as having a structural evolution comparable to the Gossa High but with the complication of being situated closer to the North Sea and therefore influenced by two structural trends (Triple point). As PL688 lies in an underexplored area between the North Sea and the Norwegian Sea, the lithological framework was also discussed. The study supported the construction of paleogeographic maps and identify lithological facies in the sub-Cretaceous package at Ritland. Fig. 3.1 outlines the tectonic history over the area related to the lithostratigraphic framework. The Gossa High was identified as a structural analogue to the main target in PL688 and the Cook Fm was considered the most likely target formation.

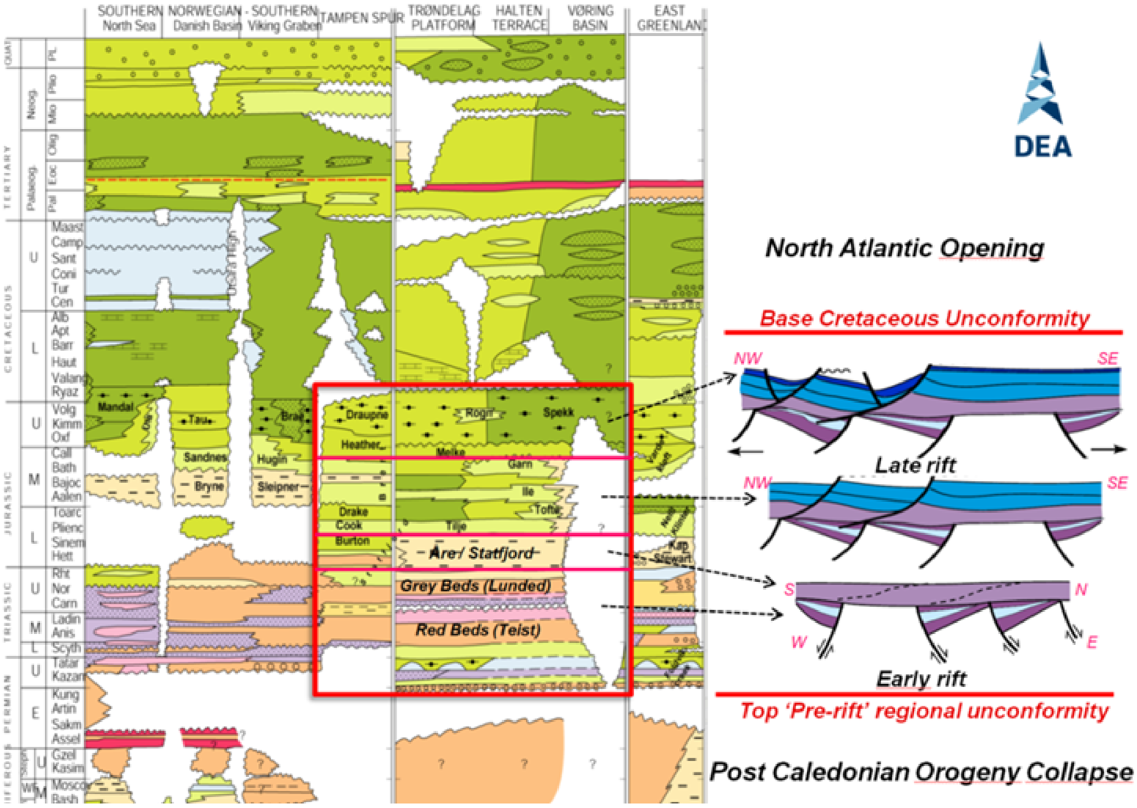


Fig. 3.1 Lithostratigraphic column

The initial processing of EO13003 was a prestack time migration. The original processing left a large degree of uncertainty in the interpretation below BCU. In 2015 and 2016, the 3D prestack depth migration (PSDM) facilitated a higher degree of confidence in the velocity model over PL688, when compared with a regional scale velocity model and purely well-based methods.

In 2016, a basin modeling study was undertaken to assess the volume of hydrocarbon generated in the area, as well as migration routes, hydrocarbon phase and trapped volume. The study was performed at semi-regional scale and concluded that the prospect area is surrounded by a large drainage catchment area. Hydrocarbon charge is not a significant risk at PL688 and the likely phase for a Jurassic target is gas/condensate. The study also showed potential for a present-day oil mature Cretaceous Blodøks Fm.

The PSDM velocities and regional 2D velocities were utilized by IkonScience in 2016 to assess temperature and pressure conditions at PL688. The study increased the confidence in the ranges used for temperature and pressure prognosis at the Ritland prospect.

Results of block evaluation and major changes compared to original licence application

The APA2012 license application evaluation was based on 2D seismic interpretation and Ritland was interpreted as two structural highs; Ritland West and Ritland East. Additional leads were interpreted in the Lower Cretaceous (Gardnos and Mjølnir) and the Lower Paleocene (Siljan North and Siljan South) (Fig. 3.2). New 3D seismic acquired in the PL688 license and special studies have improved the structural understanding of the acreage. This has lead to an adjustment of the prospectivity with the Ritland (Lower/Middle Jurassic) as the main prospect, disregarding Gardnos and retaining Mjølnir (Upper Cretaceous) and Siljan North (Lower Paleocene) as leads. Siljan South is located outsite the awarded PL688 acreage. The play model for the Ritland prospect has remained the same throughout the license period, however, the interpretation of the BCU over the structural high has changed and subsequently altered the geometry of the Ritland structure. It is the evaluation of Ritland that has had the biggest impact of the drop decision for PL688.

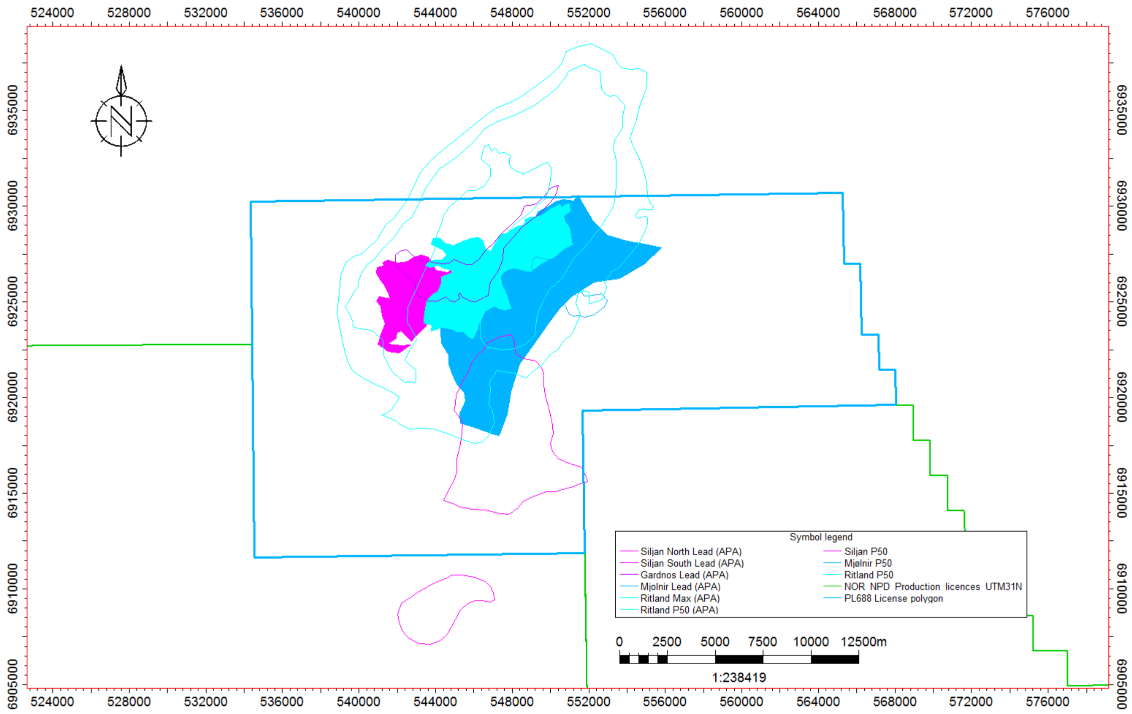


Fig. 3.2 PL688 prospects and leads

4 Prospects Update

Fig. 3.2Prospects originally presented in the license application
In the APA2012 application the main prospect Ritland was interpreted as two structural sub-closures with additional leads in the Cretaceous (Gardnos and Mjølnir) and Lower Paleocene (Siljan North) (Fig. 3.2). Regional seismic interpretation and detailed prospect interpretation on new 3D seismic data within the PL688 area has concluded that Gardnos is situated in the non prospective sub-Cretaceous interval and is therefore disregarded as a lead. Mjølnir is retained as a stratigraphic lead in the Upper Cretaceous and Siljan North is retained as a Lower Paleocene stratigraphic lead. As discussed in 3 Review of Geological and Geophysical Framework, Ritland is defined as rotated sub-Cretaceous fault blocks situated on the eastern side of the southern part of Gnaussen High.

Ritland prospect

The Ritland prospect is situated on the southern end of the Gnaussen High, on the western edge of the Slørebotn Sub-Basin, east of the Møre Basin. PL688 is relatively far from nearby wells with the closest well, 6204/11-1 gas discovery, located approximately 26km to the southeast. Sub-Cretaceous seismic tie is therefore challenging and the new 3D seismic (EO13003) provided a new and more confident BCU interpretation over Ritland, which led to substantial change when compared to the pre-award 2D seismic evaluation. The 3D seismic allowed for a greater confidence in the BCU mapping. The strong reflector below BCU was pre-award interpreted as the BCU which gave rise to the interpretation of Ritland as two similar rotated Jurassic/Triassic fault blocks: Ritland East and Ritland West. The 3D seismic, both in terms of seismic reflectivity and seismic velocity, shows a slight difference in the strong reflector in the east compared to the west and it is possible that the eastern strong reflector is in fact lower Cretaceous, possibly Agat Fm. Angular unconformity over the structure showed a pre-Cretaceous package instead of two pre-Cretaceous ridges with a thick Cretaceous sediment package between them. The grav/mag study also implied that magnetic basement is shallower in the east compared to the west of the high, thereby favouring the presence of a thicker sedimentary unit in the east. This, in turn, implied that Ritland could be defined as a singular asymmetric structure on the culmination of the structural high and is different from the licence application (Fig. 4.1).

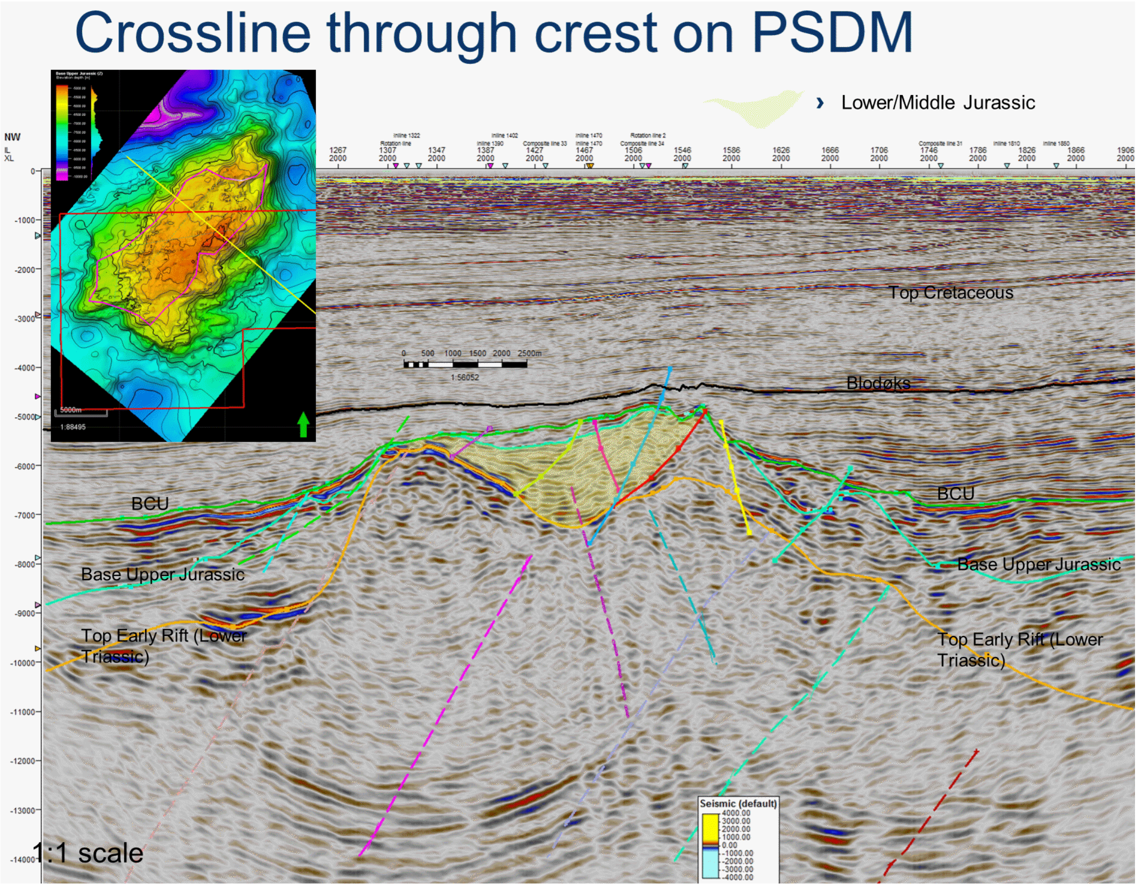


Fig. 4.1 Key seismic section 1

Ritland is interpreted as highly rotated Middle Jurassic to Early Triassic fault blocks with a thin Upper Jurassic section over the crest. It is possible to trace a pre-Cretaceous package, based on seismic signature, from the Slørebotn Sub Basin and up onto the structural high from the northeast (Fig. 4.2). As for Gossa High, a large listric fault acting as a decollement surface rooted in the Caledonian bounding the Slørebotn Sub Basin initiated during the Late Jurassic. Thereby, Ritland moved westward by detachment, creating a thick syn-tectonic package in the centre of the sub basin. Re-activation of bounding faults of Ritland from the high degree of rotation are observed continuing through the Cretaceous. Pre-Rift segments are mappable within Ritland, mainly on the eastern edge, adjacent to syn-tectonic Upper Jurassic sediments in the Slørebotn Sub Basin. Dimming of the Cretaceous package above Ritland make interpretation of the sub Cretaceous over the high challenging and suggest HC leakage. IkonScience performed a pore pressure prediction from seismic data study to evaluate the pressure regime over PL688 considering the large depth to target to facilitate initial well design discussion. Leakage is a considerable risk given the probable pressure regime and tectonic history over Ritland. Due to poor well control and poor seismic quality, the age of the Pre-Rift package on Ritland can not be interpreted with confidence. Depth conversion, using the EO13003R16 depth migration velocity field was cross-checked using thickness relations in discovery wells in the semi-regional area and a regional velocity field to investigate the conversion uncertainty. Semi-regional interpretation was also used to perform basin modelling over the PL688 acreage. The study showed that abundance of mature source rock (gas/rich gas) surrounding the structure would not be critical for filling Ritland from any direction.

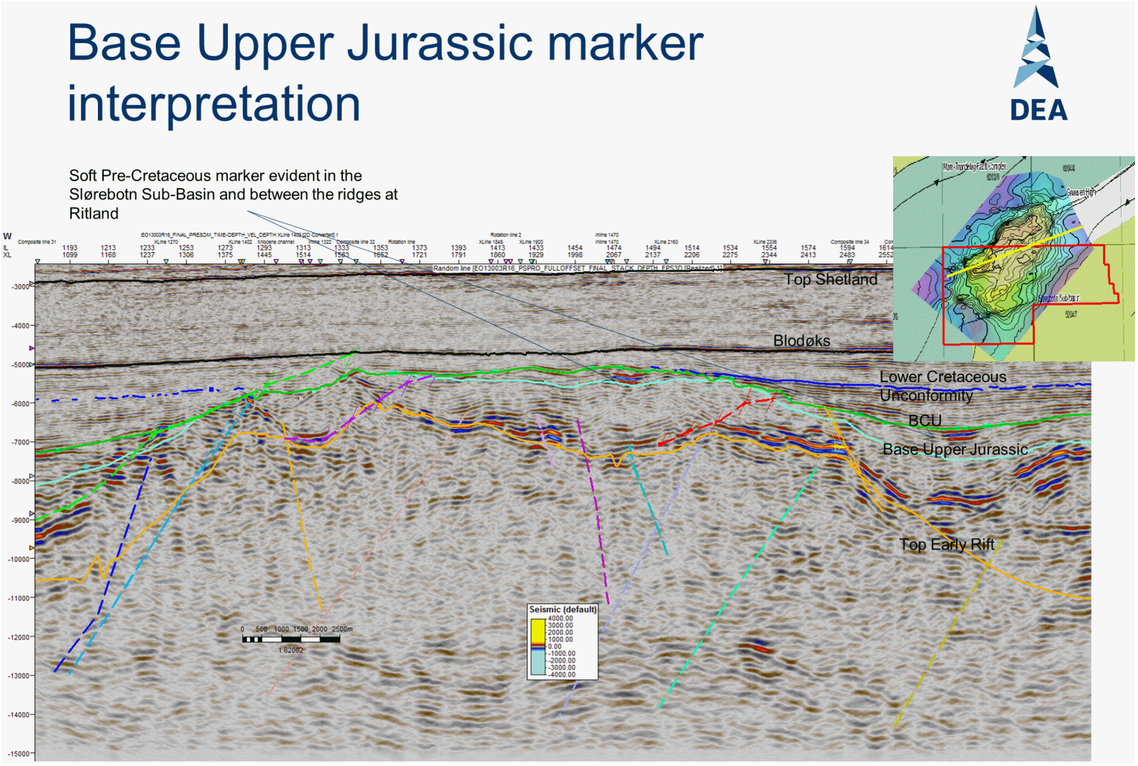


Fig. 4.2 Seismic section through crest of Ritland

Top reservoir for Ritland is defined as the mapped Base Upper Jurassic due to the lack of a confident tie to a specific lithological formation. Fig. 4.3 shows the Ritland P90, P50 and P10 prospect polygons overlain on the Base Upper Jurassic depth map. Volumetric parameters are based on statistics from North Sea wells with Cook Fm and Norwegian Sea wells with Ile, Tilje and Tofte Fm at comparable depths. Compared with the pre-award evaluation, the Ritland prospect evaluation has concluded in thinner reservoir and a smaller HC column and, consequently a considerably lower Gross Rock Volume. See overview in Table 4.1. The final prospect evaluation inputs yield and in-place and recoverable resources are given in the NPD Prospect Table: Fig. 4.4.

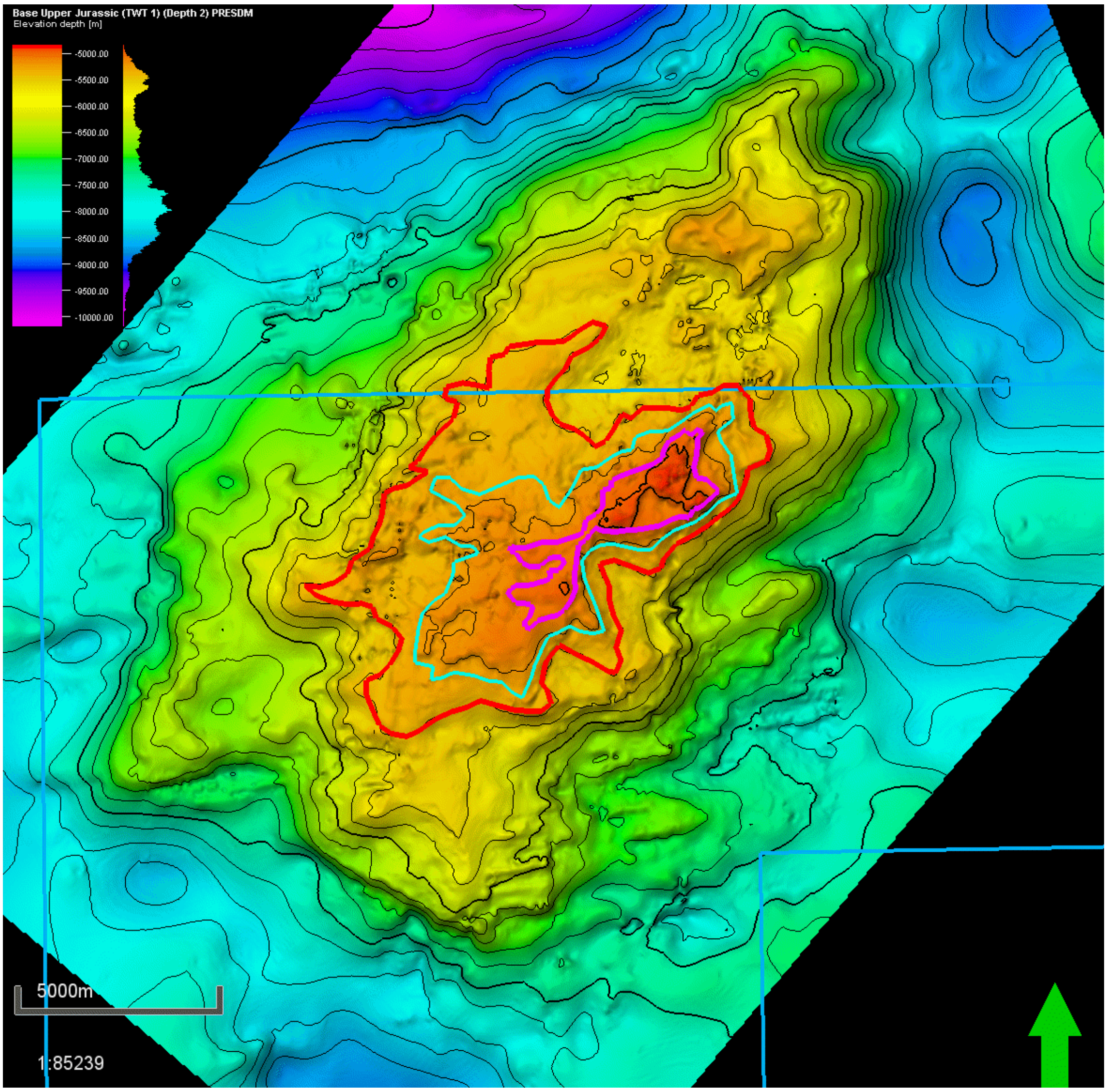


Fig. 4.3 Base upper Jurassic depth map with P90, P50 and P10 volume polygons

Table 5: Prospect data (Enclose map)

Block	6203/9, 6204/7	Prospect name	Ritland	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&Gas	Reported by company	DEA Norge AS	Reference document	Relinquishment report			Assessment year	2017
This is case no.:	1 of 1	Structural element	Gnaussen High	Type of trap	Structural	Water depth [m MSL] (>0)	170	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)					3,79	5,06	26,20	56,00
	Gas [10^9 Sm^3] (>0.00)	5,03	14,10	33,10	68,70				
Recoverable resources	Oil [10^6 Sm^3] (>0.00)					1,11	0,69	8,53	18,90
	Gas [10^9 Sm^3] (>0.00)	2,46	2,77	17,40	37,10				
Reservoir Chrono (from)	Jurassic	Reservoir litho (from)	St; Fm. Sst	Source Rock, chrono primary	Jurassic	Source Rock, litho primary	Shale	Seal, Chrono	
Reservoir Chrono (to)		Reservoir litho (to)		Source Rock, chrono secondary		Source Rock, litho secondary		Seal, Litho	
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0,17	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)	0,50	Trap (P2) (0.00-1.00)	0,70	Charge (P3) (0.00-1.00)	0,80	Retention (P4) (0.00-1.00)	0,60		
Parametres:	Low (P90)	Base	High (P10)	*P50 values are used for base case in Resources section.* *Mean values are used for base case in Parametres section.*					
Depth to top of prospect [m MSL] (> 0)		4830							
Area of closure [km^2] (> 0.0)	6,0	24,0	52,0						
Reservoir thickness [m] (> 0)	70	115	160						
HC column in prospect [m] (> 0)	295	514	687						
Gross rock vol. [10^9 m^3] (> 0.000)	3,400	6,000	9,100						
Net / Gross [fraction] (0.00-1.00)	0,28	0,45	0,62						
Porosity [fraction] (0.00-1.00)	0,13	0,15	0,17						
Permeability [mD] (> 0.0)	0,1	100,0	1000,0						
Water Saturation [fraction] (0.00-1.00)	0,45	0,35	0,25						
Bg [Rm3/Sm3] (< 1.0000)	0,0032	0,0030	0,0028						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm^3/Sm^3] (> 0)	500	700	1100						
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)	0,35	0,53	0,70						
Recov. factor, gas main phase [fraction] (0.00-1.00)	0,20	0,33	0,45						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)				For NPD use:					
Temperature, top res [°C] (>0)	185			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)	950			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.Vsh < 0,4	2.Phi > 0,1	3.					Kart nr	NPD will insert value

Fig. 4.4 Ritland resources

- Ile, Tilje and Tofte Fm. penetrations in surrounding wells provide the statistical base for gross reservoir thickness. There are very few examples of significant HC columns deeper than 4200m. The hydrocarbon contacts are based on an depth estimation of where the reservoir gets so deep that it becomes non-reservoir. The distribution is skewed to honor the possibility of a 1mmboe minimum closure.
- There are few significant discoveries in the area with reservoir depths greater than 4200m. Porosity values may vary due to exposure to secondary effects but it is challenging to predict whether such effects are present at Ritland. N/G ranges can be relatively good at depth.

Table 4.1 Main differences between the current Ritland prospect and the Ritland East prospect in the APA 2012

	APA 2012 Ritland East (Overall POFH 11%)	**Current (Overall POFH: 17%)**
Reservoir thickness (m) P90-P50-P10	50 - 122,5 - 300	70 - 115 - 160
Porosity (fraction)	0.12 - 0.15 - 0.18	0.13 - 0.15 - 0.17
N/G (fraction)	0.3 - 0.5 - 0.7	0.28 - 0.45 - 0.62
HC column height (m)	300 - 800 - 1300	295 - 514 - 687
GRV (10^9m^3)	7 - 17.2 - 38.2	3.4 - 6 -9.1
Volumes P90-P50-Mean-P10 (mmSm³oe rec res)	9.9 - 50.8 - 77.4 - 177.7	3.8 - 21 - 26 - 54.9

Play risks

The risking of the Ritland prospect yields an overall play risk of 1. Middle and Lower Jurassic reservoir has been found in wells around the Slørebotn Sub-Basin and the interpretation of the tectonic history in the area suggests that at the pre-rift stage, Ritland was much closer to present-day Norwegian North Sea margin. Upper Jurassic source is proven by the discovery in 6204/11-1. Draupne Fm in the area is in the current day wet gas generation zone and both lateral and vertical migration is possible. A thick Cretaceous shale section is present over PL688 to form a regional top seal.

Prospect geological risks

The key geological risks for Ritland remain the same as for the APA2012 application. Due to lack of nearby well control and challenging interpretation, specific lithological formations and reservoir presence cannot be mapped with confidence. However, the internal reflectivity seen on the 3D seismic together with the semi-regional mapping has slightly increased the confidence that lower and middle Jurassic sandstones are present at Ritland. Jurassic sandstone is proven on the Selje High, Gossa High and Tampen Spur but it is challenging to map a specific formation onto the Gnaussen High. The probability of reservoir presence is considered to be 0.5. The probability of encountering sufficient reservoir quality and thickness at Ritland is considered to be 0.7. There is sparse well control but the thickness between BCU and the Triassic/Basement is sufficient at Ritland and wells in the semi-regional area have Lower/Middle Jurassic sandstone with sufficient quality at depths comparable with Ritland. There is good confidence in the mapping of the BCU, revealing a prominent 4-way structure overlain by a thick Cretaceous shaley package. Base seal is either Basement or Triassic at Ritland. However, the presence of re-activated eastern and western faults, in addition to limited well control, pose a significant risk to the trap validity, considered to be 0.6. Good confidence in mapping an Upper Jurassic sequence on all sides of Ritland with direct juxtaposition possible from northeast and from southwest results in lower risk of sufficient charge. As for the other risk elements, charge suffers from lack of well control and is considered to be 0.8. The overall Possibility of Finding Hydrocarbons (POFH) for Ritland is 17%.

Table 4.2 Ritland prospect probability of finding hydrocarbons

Play risk Reservoir Presence	Play risk Source potential	Play risk Top Seal presence	Prospect Reservoir presence / preservation	Prospect Reservoir Quality	Prospect Access to Charge	Prospect Trap Validity / Retention of Charge	Probability of Finding Hydrocarbons
1.0	1.0	1.0	0.5	0.7	0.8	0.6	17%

Mjølnir and Siljan North leads

The Mjølnir lead is a stratigraphic trap in the Upper Cretaceous. Top and base reservoir interpretation is associated with significant uncertainties being cross-cut by polygonal faulting. Weak seismic anomalous amplitude behaviour has been observed but due to lack of well control it is not possible to model sand properties and expected HC response (Fig. 4.5). As for Mjølnir, the Siljan North lead suffers from lack of well control but spectral decomposition of the 3D seismic illustrates a clear east to west channel feature traversing the licensed acreage. Siljan North has a small 4-way closure but relies on up-dip stratigraphic pinchout to the east of PL688 for material volume (Fig. 4.6). The Mjølnir and Siljan North leads have unproven source and reservoir play risks in this area. See Fig. 3.2 for location overview. The key surrounding wells do not exhibit reservoir presence and there are no Cretaceous or Paleocene accumulations in the Slørebotn Sub-Basin.

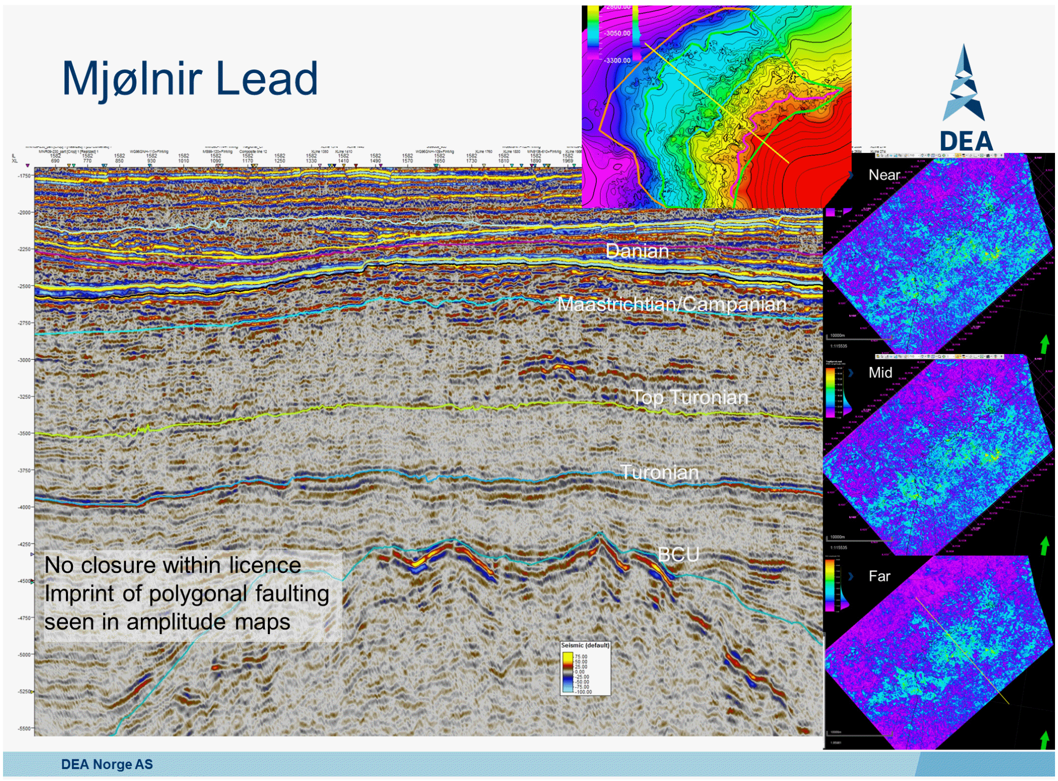


Fig. 4.5 Mjølnir Lead

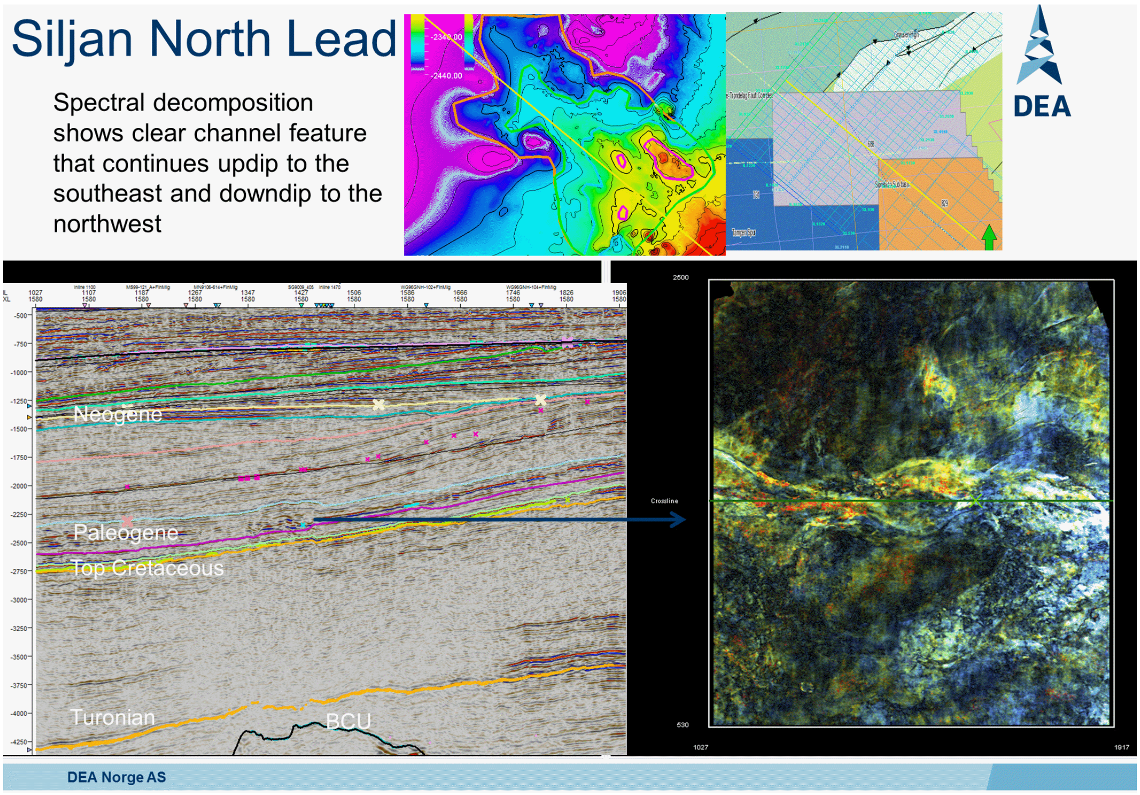
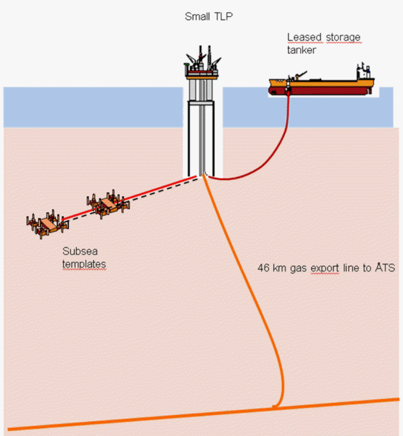


Fig. 4.6 Siljan North Lead

5 Technical Evaluation

DEA has performed a full evaluation regarding a possible development in case of discovery for Ritland. The mean production profile assumed 14 years production with 6 vertical/slanted wells as input to the calculation of the minimum economic field size (MEFS). Due to the distance to infrastructure, the development option for Ritland is a small Tension Leg Platform with two subsea templates and leased FSO (See Fig. 5.1).

- Åsgard transport T 46 km
- Knarr 90 km
- Gjøa 123 km
- Ormen Lange 144 km
- Nyhamna 180 km



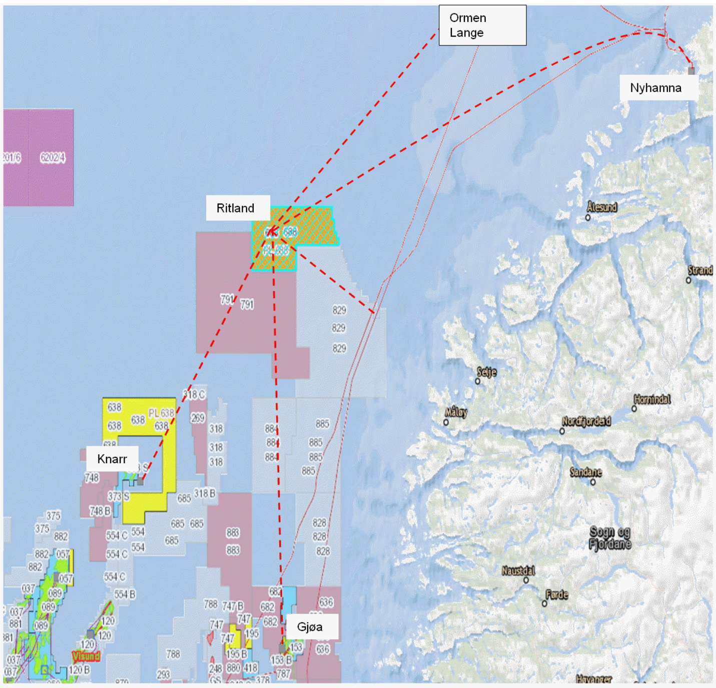
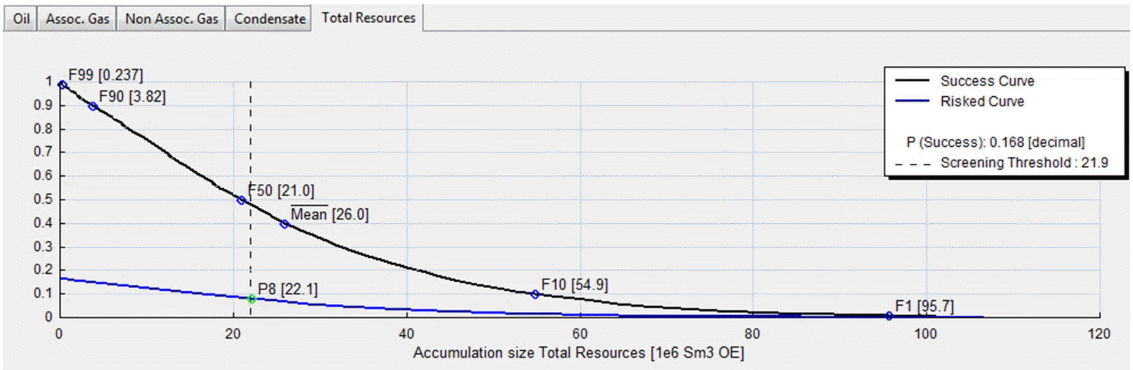


Fig. 5.1 Development solution for Ritland

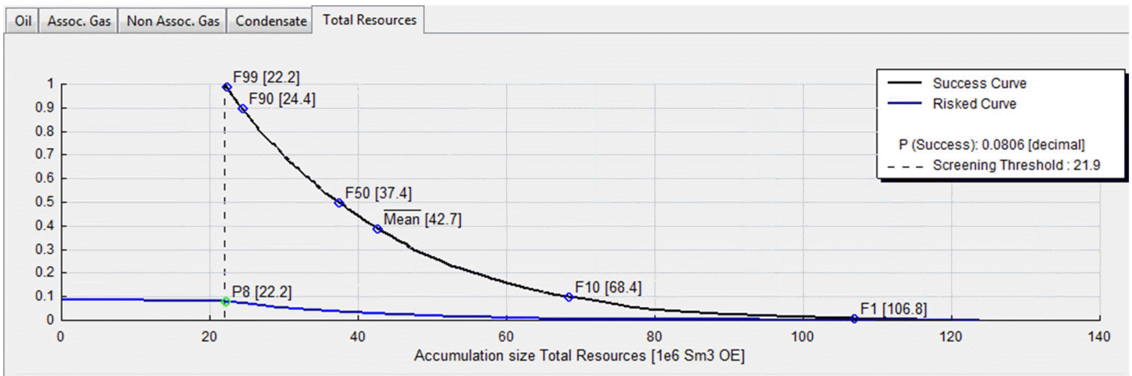
6 Conclusions

A full evaluation of all potentially prospective intervals has been conducted based on new 2D and 3D seismic data acquired by the partnership. The partnership has concluded that the prime prospect Ritland was ranked as most attractive when compared to the other leads identified in the license and a full prospect evaluation has been conducted, including volumetrics, risking, production profiles, field development studies and economic studies in order to prepare for a drilling decision. Ritland prospect was evaluated as a gas case yielding mean recoverable resources of 26 mmSm³oe and a Probability of Finding Hydrocarbons of 17% (Fig. 6.1). The main risks associated with the Ritland prospect are reservoir presence/ preservation and trap validity. The operator's Minimum Economic Field Size (MEFS) for a gas development in this area is estimated to be 21,9 Mean mmSm³oe with a small TLP. This gives a low Chance Of Commercial Success of 8% (Fig. 6.2).



Scenarios	Dist. type	Mode	Mean	Std. dev.	F99	F90	F50	F10	F1	Overall proba...
Failure										0.832
Success volume	MC(10000)	4.69	26.0	21.2	0.237	3.82	21.0	54.9	95.7	0.168
Unconditional segment	MC(10000)-r		4.36	13.0	0.0	0.0	0.0	16.6	64.5	1.000

Fig. 6.1 Ritland resource curve



Scenarios	Dist. type	Mode	Mean	Std. dev.	F99	F90	F50	F10	F1	Overall proba...
Failure										0.919
Success volume	MC(4797)	0	42.7	19.0	22.2	24.4	37.4	68.4	106.8	0.081
Unconditional segment	MC(4797)-r		3.44	12.8	0.0	0.0	0.0	0.0	64.5	1.000

Fig. 6.2 Ritland resource curve with truncation

Based on this technical evaluation the license does not see the basis for a positive drill decision and has agreed to relinquish PL688.