PL 863, PL863B

License Status Report

Contents

1. PL863 History

1.1 PL863 Summary

PL863 (including PL863/B) is located on the Sørvestlandet High, to the north-east of the Ula Field. The license area covers part of Blocks 7/9, 8/4, 8/5, 8/7, 8/8, and 8/10 (Ref. Fig.1). The license was awarded to A/S Norske Shell (Operator 60%) and Aker-BP (40%) on10.02.2017 (APA16) and PL863B was awarded to the same partnership the following year (02.03.2018) (APA2017) as a contiguous extension to the 863 licence to cover the complete area of the anchor prospect, Sgurr Alasdair. Both licenses with Drill or Drop to be taken February 2020.

The Sgurr Alasdair prospect was evaluated on the reprocessed 3D data and reveals a more segmented opportunity compared to the original evaluation. Key risks were related to charge and long-distance migration as well as seal integrity related to the high relief, salt-cored structure. Neighbouring AkerBP operated well 8/10-7S (Cassidy) also supported the depositional model for the area but increased the risk on both reservoir thickness and quality.

Low Pg (<5%) in combination with low volumes and lack of additional prospectivity in the remaining part of the license are the basis for the partner decision to relinquish PL863/B at the milestone in February 2020.

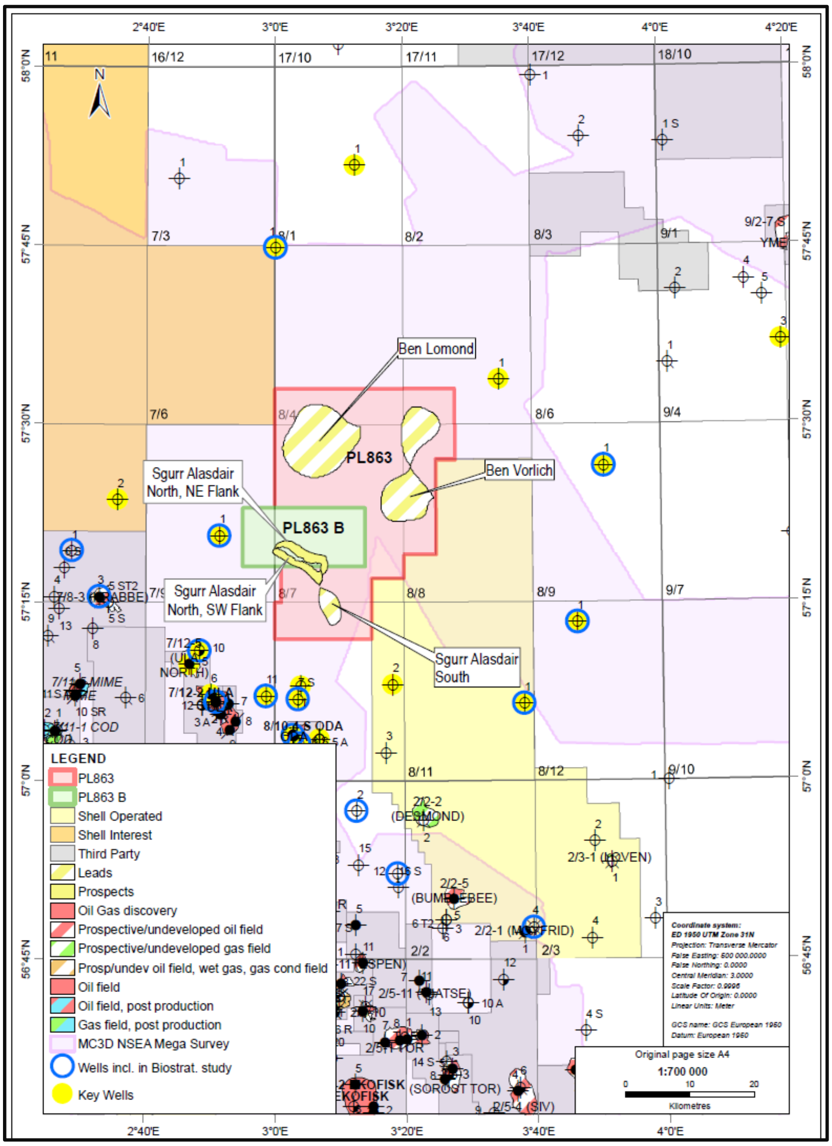


Fig. 1 License Location Map

1.2 Status of Work Commitment

The partnership acquired the PGS16008 broadband 3D seismic data to fulfil the initial work committment. The operator has completed a full technical evaluation, including specialist studies that have been incorporated into the evaluation, in order to understand the main uncertainties and risks, which fulfils the G&G studies stipulated in the licence obligation. Table 1 summaries the special studies carried out and integrated into the evaluation of the licence.

Table 1. G&G study Overview

		Activites carried out to address the main uncertainties					
		Seismic reprocessing	Rock physics and QI	Regional well review	Biostratigraphy study	Palaeogeography Study	Basin Model
main uncertainties	Reservoir presence	★	★	★	★	★	
	Charge	★		★		★	★
	Trap	★					

1.3 Licence Meetings

Meetings have been held on a regular basis for the license. A list of meetings is shown in Table 2., and documentation of these meetings is available on Licence2Share.

Table 2. PL863 Meetings

Meeting	Date
ECMC 1	30th March 2017
Workmeeting	29th September 2017
ECMC 2	29th November 2019
ECMC 3	8th May 2018
ECMC 4	8th November 2018
ECMC 5	26th November 2019

1.4 Explanation of grounds for lapse

Detailed geological and geophysical evaluations on PL863 have resulted in significantly greater risk and smaller volumes for prospects than assessed at application. A technical summary of the evaluations is given in Table 3. No drillable prospects have been identified, and the partnership has agreed to relinquish the licence.

Table 3. Outcome of Technical Evaluation

Name	Current Status	Outcome of Technical Evaluation
Sgurr Alasdair SW flank	Prospect	Sgurr Alasdair SW and NE flanks are reliant on long distance migration. The risk on charge is significant given the current understanding of the reservoir model, the information in nearby wells, and the results of the Cassidy well. Sgurr Alasdair NE flank carries additional charge risk due to the presence of sealing faults in the region, and the structural configuration of the area between the two prospects. Faults that penetrate almost to the surface have increased seal risk. Reservoir thickness and effective reservoir presence are downgraded due to the Cassidy well results. P_g is 0.05 for the SW flank, and 0.02 for the NE flank.
Sgurr Alasdair NE flank	Prospect	
Sgurr Alasdair South	Lead	The results of the Cassidy well show that there is no charge route into Sgurr Alasdair South, and also downgrades the reservoir thickness and quality that is anticipated for the Ula formation in this area.
Ben Lomond	Lead	Long distance migration from the basin onto the platform to reach these leads is considered highly unlikely, and immaturity of source rock on the platform precludes a local charge to these leads.
Ben Vorlich	Lead	

2. Database Overview

2.1 Common Database Details

Wells used in the technical evaluation and resource assessment for the licence area are shown in Table 4. While a significant number of wells have penetrated the Jurassic in the region, few wells exist on the Sørvestlandet High.

Table 4. Well Database

Offset wells used in the evaluation

Well	Date	Operator	TD (m MD)	Well class	Oldest penetrated age	Result	Main discovery age	Comment
1/3-5	1984	A/S Norske Shell	4850	WILDCAT	EARLY PERMIAN	DRY		
2/1-3	1979	BP Norway Limited U.A.	4297	WILDCAT	LATE PERMIAN	OIL	LATE JURASSIC	Gyda field
2/1-4	1982	BP Petroleum Dev. of Norway AS	4525	APPRAISAL	LATE PERMIAN	OIL	LATE JURASSIC	Gyda field
2/1-7	1984	BP Petroleum Dev. of Norway AS	5464	WILDCAT	EARLY PERMIAN	DRY		
2/1-10	1991	BP Norway Limited U.A.	4525	WILDCAT	TRIASSIC	OIL SHOWS		
2/2-2	1982	Saga Petroleum ASA	3127	WILDCAT	LATE PERMIAN	GAS	OLIGOCENE	
2/3-1	1969	Norske Murphy Oil Company	2934	WILDCAT	LATE PERMIAN	GAS	OLIGOCENE	
6/3-1	1984	Den norske stats oljeselskap a.s	3560	WILDCAT	LATE TRIASSIC	OIL/GAS	LATE JURASSIC	Gaupe field
6/3-2	1985	Den norske stats oljeselskap a.s	4091	WILDCAT	EARLY PERMIAN	SHOWS		
7/1-1	1971	Amoco Norway Oil Company	2808	WILDCAT	TRIASSIC	DRY		
7/12-5	1981	BP Norway Limited U.A.	4440	WILDCAT	LATE PERMIAN	OIL	LATE JURASSIC	Located in Ula North. Oil bearing Ula (low porosity), shows in Skagerrak
7/12-6	1981	BP Norway Limited U.A.	3700	WILDCAT	TRIASSIC	OIL	LATE JURASSIC	Located in Ula field. Oil bearing Ula and Skagerrak
7/3-1	1969	Amoco Norway Oil Company	4700	WILDCAT	CARBONIFEROUS	DRY		
7/4-1	1993	Den norske stats oljeselskap a.s	3133	WILDCAT	LATE PERMIAN	DRY		
7/4-2	2007	Lundin Norway AS	3459	APPRAISAL	LATE PERMIAN	OIL	LATE JURASSIC	Brynhild
7/4-3	2013	Lundin Norway AS	3000	WILDCAT	TRIASSIC	DRY		
7/7-1	1989	Den norske stats oljeselskap a.s	3500	WILDCAT	LATE TRIASSIC	DRY		
7/7-3	1993	Den norske stats oljeselskap a.s	3584	APPRAISAL	LATE PERMIAN	SHOWS		BRYNHILD
7/8-2	1973	Phillips Petroleum Company Norwa	3006	WILDCAT	LATE PERMIAN	DRY		No shows
7/8-3	1983	Conoco Norway Inc.	4320	WILDCAT	LATE PERMIAN	OIL	LATE JURASSIC	
7/9-1	1971	Conoco Norway Inc.	2931	WILDCAT	LATE PERMIAN	DRY		No shows, cored Tor
7/11-9	1985	Norsk Hydro Produksjon AS	4271	WILDCAT	EARLY TRIASSIC	SHOWS		
7/11-11S	2007	Talisman Energy Norge AS	4679	APPRAISAL	TRIASSIC	OIL SHOWS	LATE JURASSIC	MIME
7/11-12A	2011	ConocoPhillips Skandinavia AS	5672	WILDCAT	TRIASSIC	GAS	LATE JURASSIC	
7/12-2	1976	BP Norway Limited U.A.	3676	WILDCAT	EARLY JURASSIC	OIL	LATE JURASSIC	ULA
7/12-10	1991	BP Norway Limited U.A.	3667	WILDCAT	TRIASSIC	OIL SHOWS		
7/12-11	1991	BP Norway Limited U.A.	3868	WILDCAT	LATE TRIASSIC	SHOWS		
7/12-13S	2012	Det norske oljeselskap ASA	4575	WILDCAT	MIDDLE TRIASSIC	DRY		
8/10-1	1969	Phillips Petroleum Company Norwa	3089	WILDCAT	LATE PERMIAN	DRY		No shows, reservoir interpreted as Sandnes Fm
8/10-2	1980	Phillips Petroleum Company Norwa	2997	WILDCAT	LATE PERMIAN	DRY		No shows, good sand in Jurassic, poor in Triassic
8/10-3	2010	ConocoPhillips Skandinavia AS	5738	WILDCAT	EARLY PERMIAN	DRY		Butch Discovery Well. ODT base Ula. Triassic dry
8/10-4 S	2011	Centrica Resources (Norge) AS	3071	WILDCAT	LATE PERMIAN	OIL	LATE JURASSIC	
8/1-1	1971	Phillips Petroleum Company Norwa	2971	WILDCAT	LATE PERMIAN	DRY		No shows
8/11-1	1975	Phillips Petroleum Company Norwa	3810	WILDCAT	TRIASSIC	DRY		No shows, Portlandian-Kimmeridgian sand (Ula)
8/12-1	1971	Conoco Norway Inc.	2875	WILDCAT	TRIASSIC	DRY		Weak shows M.Jurassic, cored, elevated TG in Cenozoic
8/3-1	1966	Esso Exploration and Production Nor	3015	WILDCAT	PRE-DEVONIAN	DRY		
8/4-1	1977	Unocal Norge A/S	2632	WILDCAT	LATE PERMIAN	DRY		Trace residual oil in sidewall cores - elevated C3/4
8/5-1	2013	Lundin Norway AS	2405	WILDCAT	TRIASSIC	DRY		No shows, poor reservoir
8/9-1	1975	Conoco Norway Inc.	2376	WILDCAT	LATE PERMIAN	DRY		No shows
9/4-1	1968	Conoco Norway Inc.	2963	WILDCAT	LATE PERMIAN	SHOWS		Shows upper 5m of Sandnes. mature Tau and Bryne
9/4-5	2006	ExxonMobil Exploration and Product	5881	WILDCAT	CARBONIFEROUS	DRY		
9/8-1	1968	Esso Exploration and Production Nor	2176	WILDCAT	LATE PERMIAN	OIL SHOWS		

2.2 Seismic Database

Both 2D and 3D data were integrated to provide a regional interpretation over the wider Southern Norwegian North Sea. The 3D seismic data was primarily used for interpretation and prospect evaluation within the PL863 licence area. A summary of the 2D seismic utilised in the regional interpretation is shown in Table 5. 3D seismic used were: MC3D_N_SEA_ Mega_2013 (PGS Megamerge) and PGS16008 broadband data. The PGS16008 data was also reprocessed as part of the evaluation programme for PL863.

Table 5. Seismic Database

2D Seismic surveys used in the evaluation of PL863:

Survey	Type	Year	Shot for	Area	Status	Public date	Quality
NSR04	2D	2004	TGS	56-59N	PUBLIC	20150304	Good/moderate
CGME96	2D	1996	NOPEC	BL.7/1,2-8	PUBLIC	20070930	Moderate/Poor
SHD97	2D	1997	NOPEC	F. 2,3,8	PUBLIC	20080330	Moderate/Poor
EBS00	2D	2000	NOPEC	F9,10,11&4	PUBLIC	20110618	Moderate/Poor
GUGM-94	2D	1994	WESTGEC	ULA GYDA M	PUBLIC	20050712	Moderate/Poor
SGT-8606	2D	1986	SAGA	CENT.GRABE	PUBLIC	0	Moderate/Poor
GNSR-91	2D	1991	WESTGEC	REG.NS+UK	PUBLIC	20030705	Poor
SHDE98	2D	1998	NOPEC	SYD NORDSJ	PUBLIC	20090105	Good
RTD-81	2D	1981	NOGEC	REG DANMAR	PUBLIC	0	
RTD-81-RE94	2D	1994		REG DANMAR	PUBLIC		Moderate/Poor
NSE-81-RE96	2D	1996		REG DANMAR	PUBLIC		Moderate/Poor
NDBRE96	2D	1996	NOPEC	NOR/DAN	PUBLIC	20070930	Poor
SET96	2D	1996	NOPEC	FELT 3 & 4	PUBLIC	20070117	Poor

3. Results of Geological and Geophysical Studies

3.1 Update of Geological Framework

3.1.1 Seismic Interpretation

Integrated 2D and 3D seismic interpretation was carried out to provide input to the semi-regional basin model study and to enable a better geological context for the Upper Jurassic play and broader portfolio understanding (Fig.2.). Despite considerable effort, including reprocessing of the seismic data, rock physics analysis and AVO interpretation, it was not possible to definitively map the key reservoir, the Upper Jurassic Ula Formation, across large parts of the platform area (in contrast it is possible to map the Ula Formation in the deeper graben).

3.1.2 Seismic Reprocessing

The PGS16008 3D broadband seismic data were reprocessed in order to attenuate strong, low frequent multiple energy associated with the Base Cretaceous unconformity (Fig. 3.). The demultiple processing sequence consisted of derivation of two multiple models; an interbed multiple model & a deconvolution model – both models were subtracted simultaneously in PreStack offset planes.

The processing appears to be effective in attenuating the targeted multiple energy. Potential impact on primary energy remains a concern. There is also some high frequency, water-bottom reverberation related multiple energy remaining.

3.1.3 QI and Geophysics

A detailed rock physics study was undertaken, including 16 wells in the study area. This comprised log data conditioning, petrophysical analysis and upscaling, derivation of rock properties, rock and fluid trends and regressions and seismic modelling. The results of the rock physics model were applied to the reprocessed 16008

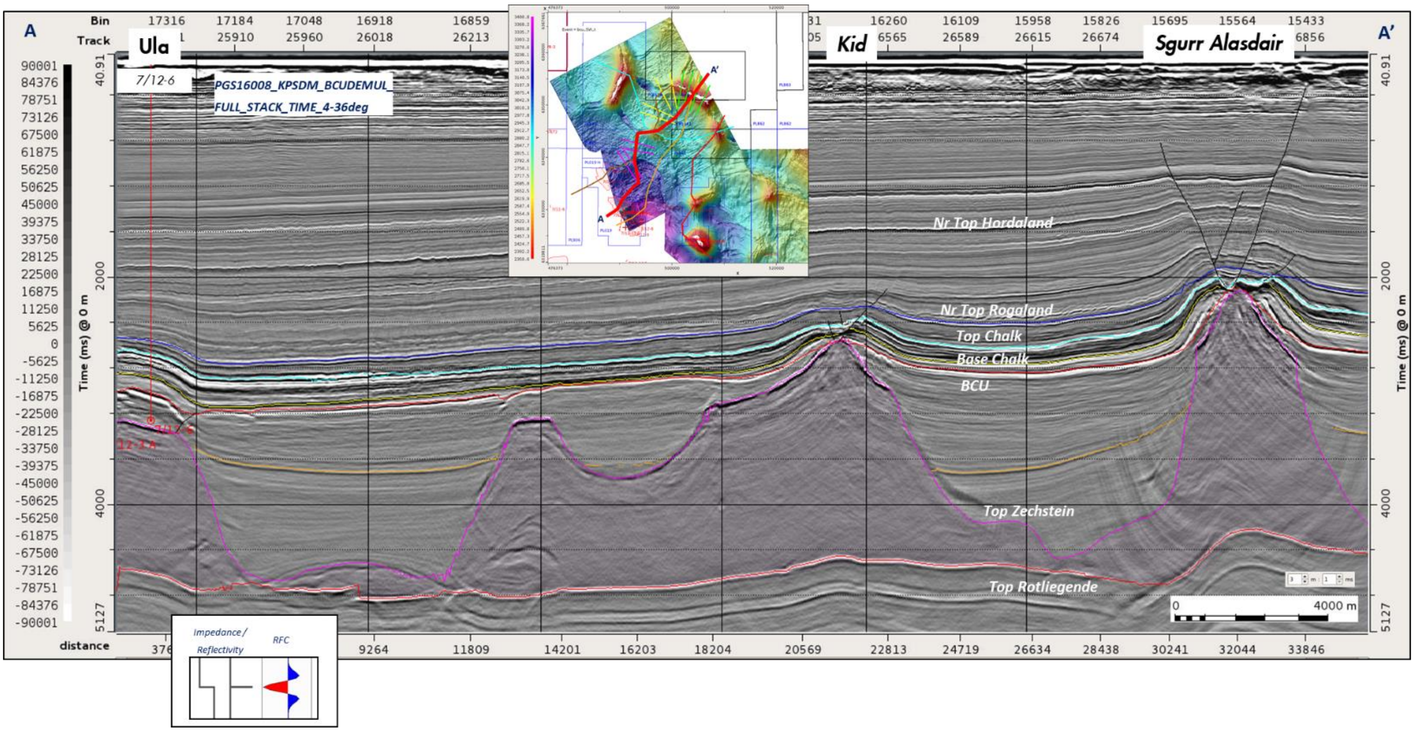


Fig. 2. Arbitrary seismic line through the Ula Field and prospects "Kid" and "Sgurr Alasdair

PGS16008 demultiple PSDM (in time) illustrating mapped events.

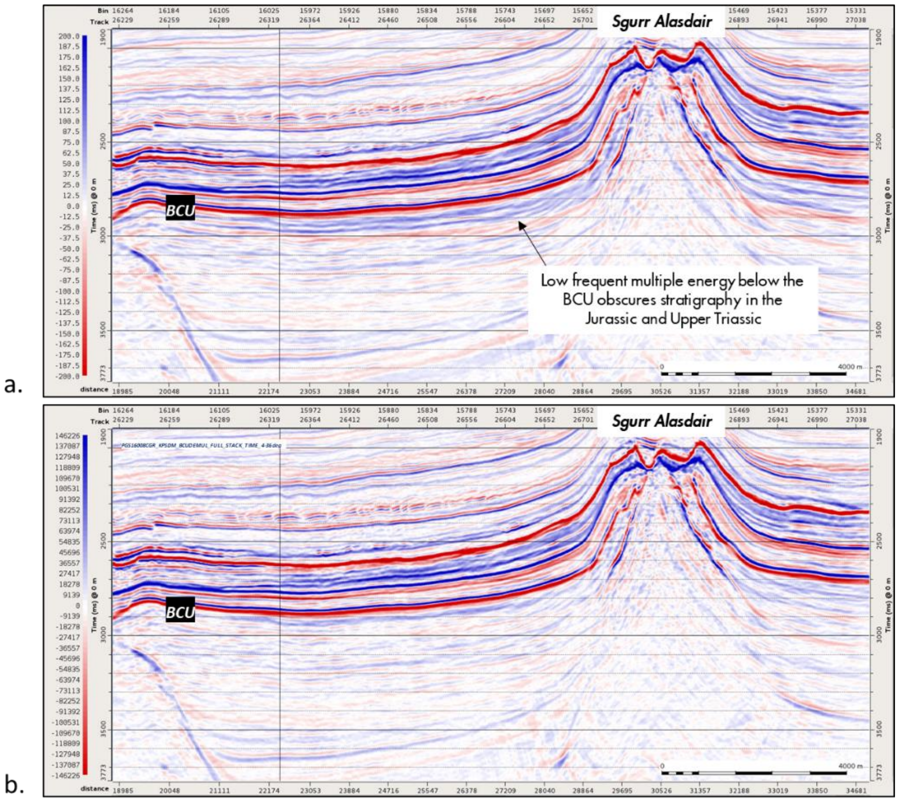


Fig. 3. Arbitrary seismic line through Sgurr Alasdair

a. PGS16008 original PSDM (in time) b. PGS16008 demultiple PSDM (in time). Note the effective attenuation of low frequent multiple energy immediately below the BCU.

demultiple data through PreStack data conditioning, conversion to relative impedance and derivation of AVO attributes.

There are significant challenges for the application of quantitative seismic interpretation in the area: Rock Properties are highly variable for bounding overburden / underburden lithologies. The Ula sst has a very subtle stack amplitude response; it can be negative, transparent or positive (depending on bounding lithologies). The seismic data still has residual multiples, even after reprocessing, while the demultiple has also likely removed some primary energy. The seismic also has limited bandwidth. The Ula Formation is largely at / below seismic resolution (e.g. updip wells, not Ula Field). As a result, it was not possible to map a unique Ula sandstone across much of the platform area. Taken at face value "Fluid Factor" volumes appear to indicate potential widespread, but thin & discontinuous reservoirs immediately below the Mandal pick, with small of areas of thicker reservoir in the north, and potentially on the south flank of Sgurr Alasdair. However, given the caveats noted above, this interpretation has to be treated with a very high degree of caution. As a result, it was concluded that there is no compelling evidence from QI of interpods with a thick Upper Jurassic reservoir sequence in the PL863 area.

3.2 Structural and Stratigraphic Evolution

The APA application was focused on the Sørvestlandet High area (Fig. 4) directly adjacent to the Cod Terrace and greater Central Graben, where significant recoverable resources are found in the Upper Jurassic reservoirs of the Ula, Gyda and Tambar fields. The Central Graben is located along the southern arm of the Jurassic rift system and has a generally symmetrical morphology that has evolved from a complex structural history. Erratt (1993) proposed that this polyphase rift system has undergone various subtle changes in principal stress direction, particularly during the Jurassic-Cretaceous rift episode that had a pronounced effect on the morphology of various sub basins throughout the evolution in the Central North Sea.

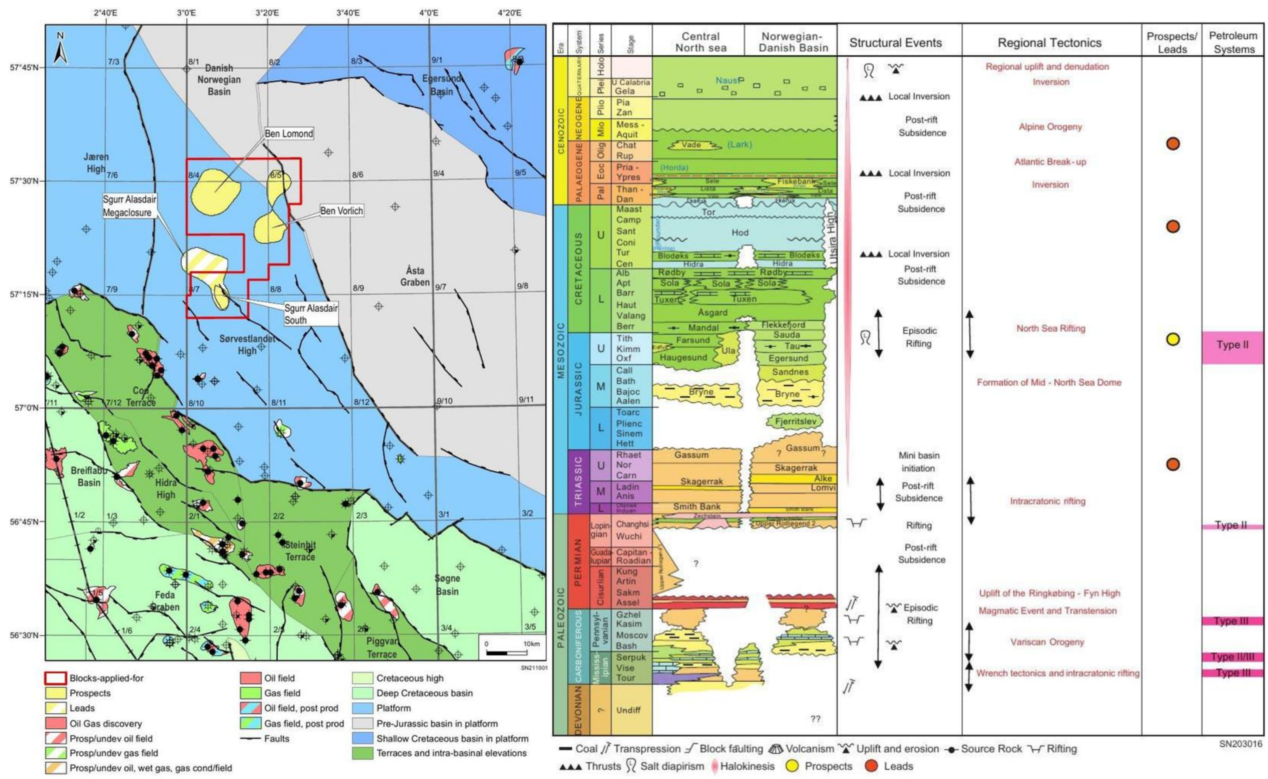


Fig. 4. Structural Framework and Tectono-Stratigraphic Chart

Chronostratigraphic and lithostratigraphic column illustrating key structural events and prospective intervals

3.3 Reservoir

The Ula Formation reservoir is comprised of marginal to shallow marine sands which are typically of good reservoir quality, although depending upon environment of deposition, they can exhibit rapid lateral facies changes reducing reservoir quality. The play concept on the Sørvestlandet High is that shorefaces have progressively backstepped onto the high throughout the Kimmeridgian and Tithonian (Fig. 2.6 in Sørvestlandet High NW in APA 2016 - Sørvestlandet High NW). Limited well control and inadequate age dating of the stratigraphy in the wells makes accurate timing of this transgression challenging. This is further complicated by an overprint of various unconformities that are present in the latter stages of the Upper Jurassic.

The pod-interpod model (Fig. 2.13 in Sørvestlandet High NW in APA 2016 - Sørvestlandet High NW) is the most successful predictive model for sand deposition and preservation in the halokinetically controlled Upper Jurassic, such as the Ula Formation and its age equivalent on the UK Continental Shelf, the Fulmar/Hugin Formations. The fundamental aspect of the model is that during the Triassic period extension generated Triassic "pods", typically composed of Smith Bank Formation shales. These pods are the result of subsidence due to differential loading of the Zechstein salt creating preferential depocentres. Through time pods became grounded on the underlying Permian and could not subside further. New depocentres were then associated with the areas between the "pods" where salt dissolution and other mechanisms lead to greater thickness of the Late Triassic Skagerrak and later Jurassic Ula formations being deposited (Fig. 2.12 in Sørvestlandet High NW in APA 2016 - Sørvestlandet High NW.

In this area, the interpod model needs some modification. Fig. 5. illustrates a conceptual model for the deposition and preservation of the Ula Formation in the study area. Here the sandstones pinch out against the flanks of highs caused by emergent salt rather than having been deposited and ultimately preserved across the crests of collapsing salt walls. Deposition was entirely subaqueous across the area and at broadly lower shoreface water depths, with preservation of Ula occurring between Triassic pods which were themselves wave-swept, sand-free and colonised by sponges. This has implications for the thickness patterns of the Ula Formation as well as the distribution of reservoir quality, as is seen in analogous wells in the study area. Drilling of the Cassidy well (8/10-7S) within the licence period, supports this geological model, and increases the risk on reservoir presence and thickness. Figure Fig. 6. is a semi-regional wireline log correlation of wells with biostratigraphy. The Ula formation thins dramatically onto the platform, as the shoreface sands pinch out onto the salt highs, rather than being deposited as typical inter-pods, as seen, for example, in the Ula Field. The Ula Formation on the platform consists of J64 and younger sands only, while in the Ula Field, to the west, for example, J62-J66 sands are identified.

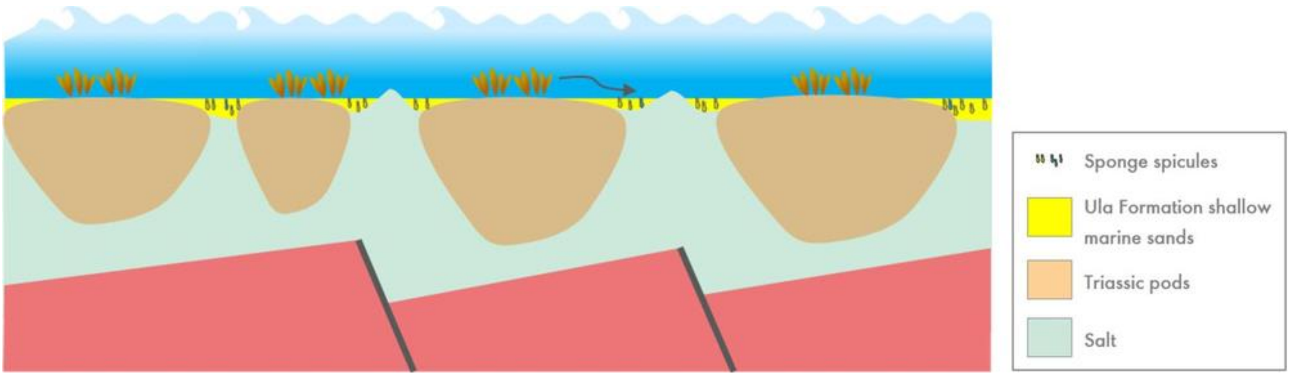


Fig. 5. Interpod Model for the License Area

Conceptual model for the deposition of the Ula Formation in the PL863 area, with the reservoir pinching out against salt highs.

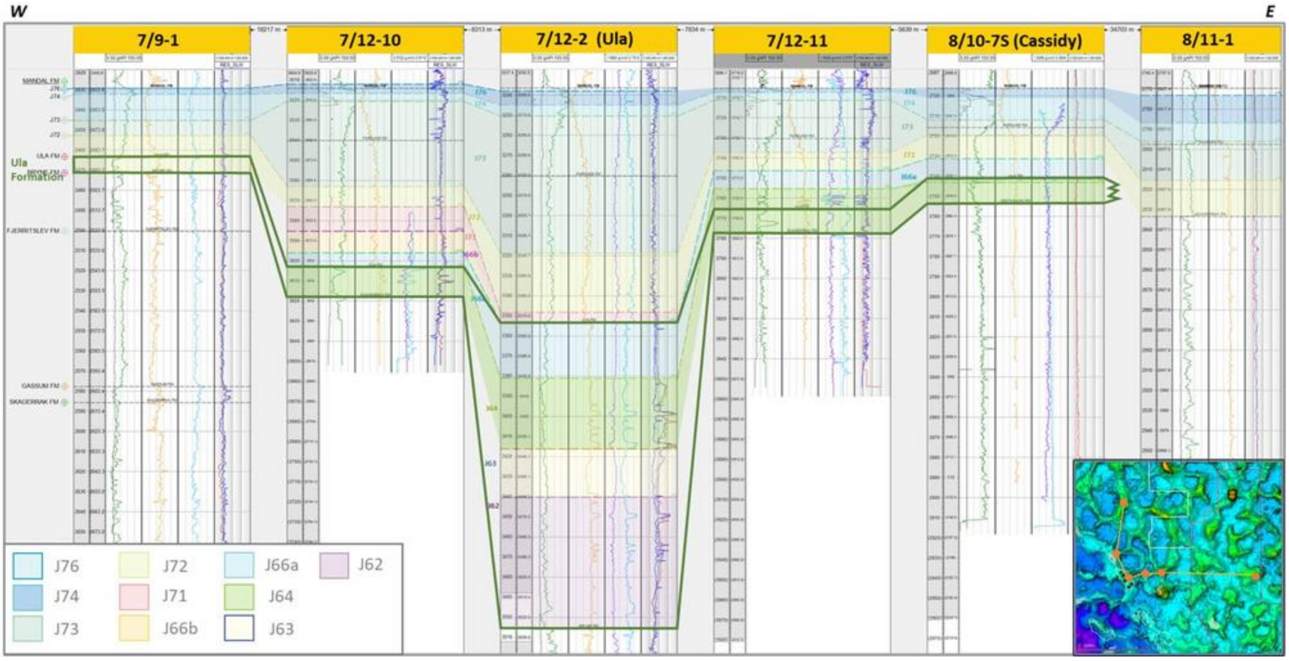


Fig. 6. Wireline Log Correlation
Semi-regional wireline log correlation, showing the changing facies of the Ula Formation in the area, and the biostratigraphic zones the Ula Formation comprises.

3.4 Seal

The Upper Jurassic play is sealed by the marine shales of the Upper Jurassic Mandal formation and the Lower Cretaceous Cromer Knoll Group. At a play level the Upper Jurassic does not have notable risk. At prospect level, however, the seal above Sgurr Alasdair SW and Sgurr Alasdair NE flank is affected by numerous faults, some of which extend almost to the surface, significantly increasing top seal risk (Fig. 8.).

3.5 Trap

Given the structural and stratigraphic complexity associated with the halokinetically controlled Upper Jurassic, various trapping styles for the play are developed. Brynhild can be described as either a diapir collapsed mini-basin, as described by Mannie et al (2016), or an interpod as described by Hodgson et al (1992). The Ula field is an example of a potential interpod or similar salt-controlled feature that has then undergone Cretaceous inversion to produce the four-way dip closed anticline. The Oda field is an example of a salt flank closure where the salt has been active throughout the Cretaceous and Tertiary, long after deposition of the Upper Jurassic reservoir in which the discovery was made. The trapping style for Sgurr Alasdair is a faulted dip closure, likely with significant pinch-out of the Ula formation against the flanks of a salt diapir.

3.6 Charge

A basin model was completed as part of the evaluation. As mapping of the Ula reservoir was not possible, a pseudo top-Ula was constructed using the top Salt map, with fairways assumed to be controlled by accommodation above the salt. Given the thin and poor nature of the Ula sandstone encountered in wells near the licence area, and the geological model for reservoir deposition and preservation, this charge model is considered an optimistic scenario.

Source rock within and directly to the west of the licence area is immature to, at best, marginal mature, and so local charge is considered unlikely (Fig. 7.). Long distance migration is the only possible route for significant charge into the prospects in PL863, however there are no positive indications for long distance migration onto the platform in this area. Charge to the prospects would need to bypass several dry wells, with no evidence of hydrocarbons in the Jurassic section, in order to reach the licence area.

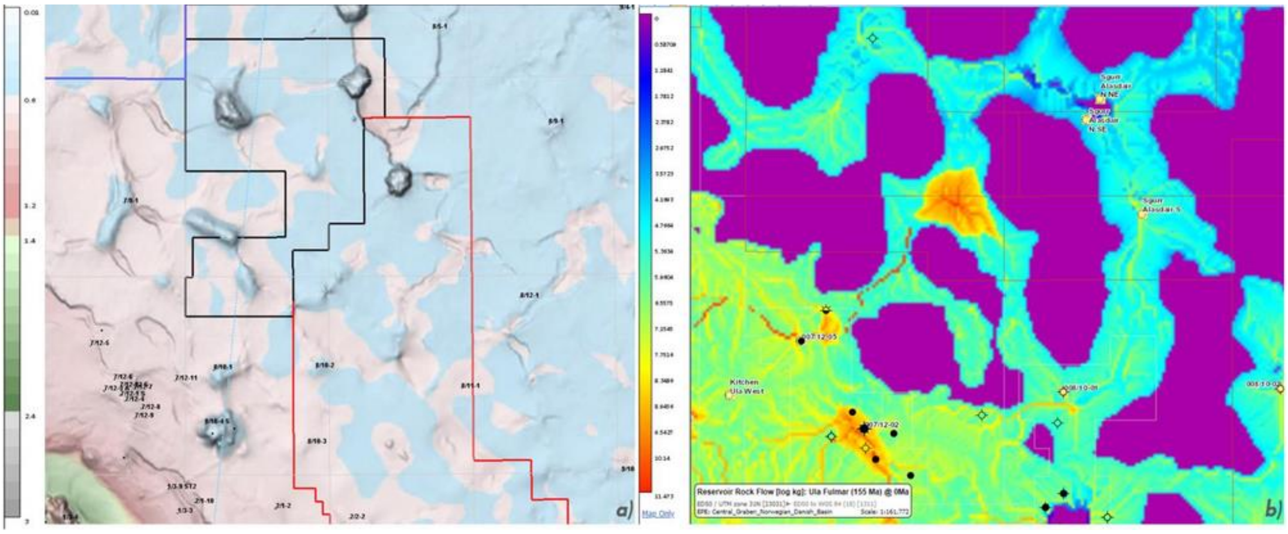


Fig. 7. Basin Model Results in the License Area
a) Maturity map for the Mandal formation - the source rock is immature to marginal mature over the license area. b) Migration intensity map - Kid must be filled and spilled before Sgurr Alasdair could be charged. There is no flow in the model from the south (past Cassidy), or from the north (past the dry 7/9-1 well).

All charge models, except for the route past Cassidy (8/10-7S), require the Kid prospect in PL811 to fill and spill into Sgurr Alasdair (Fig. 7). This would require filling a column of approximately 500m height. In order to fill the NE flank of Sgurr Alasdair, charge would then have to migrate across a graben where offset is greater than that of reservoir thickness. A likely route of spill from Kid is considered to be towards the north, away from Sgurr Alasdair, due to the fine structural configuration on the northern limb between Kid and Sgurr Alasdair.

It is therefore concluded that hydrocarbon charge to the prospects is extremely unlikely.

4. Prospect Update Report

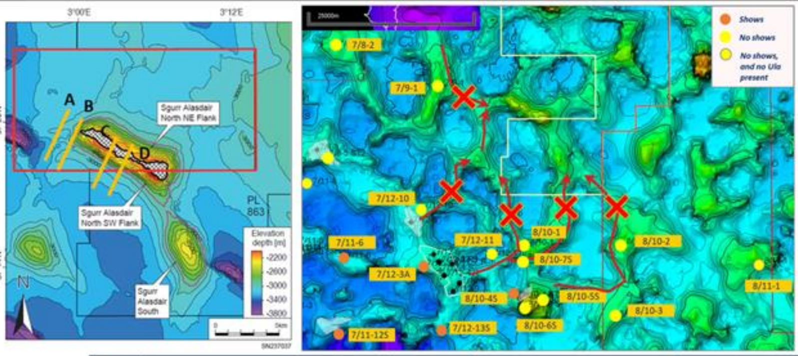
4.1 Prospects

4.1.2 Overview

At the time of application several prospects were identified. Sgurr Alasdair North (comprising two parts; a south west flank and a north east flank) was the anchor prospect. Further prospects Sgurr Alasdair South, Ben Lomond and Ben Vorlich were identified. Hydrocarbon charge, requiring long distance migration, is the common principal risk for all prospects in PL863. Charge is now considered unlikely. The preferred migration route into Sgurr Alasdair requires fill and spill of the Kid structure to the south west in the adjacent PL 811 (which already has significant risk). The neighbouring Sgurr Alasdair South prospect is not filled in any basin modelling scenario. Migration from the north into the prospects to the north east of Sgurr Alasdair (Ben Vorlich, Ben Lomond) is considered very unlikely. Further, the recent Cassidy well (8/10-7S) supports the depositional model for the Ula Fm., and increases risk on reservoir thickness and quality. There is additional risk in seal integrity in the high relief, salt-cored structures in PL863. The evaluation results in significantly higher risk and much lower volume promise than appreciated in the APA applications. At present there are no drillable prospects defined in PL 863.

4.1.3 Key Risks and Uncertainties

The primary risk for all prospects in the licence is charge, with models indicating an extremely high risk of any prospect having been charged, with increasing risk with distance from the mature kitchen to the west. Fig. 8. shows dry wells are present along all the potential migration paths into the structure. The results of 8/10-7S (Cassidy) support this interpretation and increase the charge risk further. As the geoseismic sections in the figure illustrate, the prospects also carry a significant risk of compromised top seal, with faults seen extending almost to seabed, in very high relief structures. Effective reservoir presence is also a risk, with the Ula Formation below seismic resolution and the Jurassic section seen to thin and pinch out onto the salt flanks. Following the technical evaluation, Sgurr Alasdair SW flank carries a Probability of Success (POS) of 0.05, and Sgurr Alasdair NE flank has a POS of 0.02. No further de-risking activities are believed to be possible, short of drilling a well.



	Sgurr Alasdair North NE Flank	Sgurr Alasdair North SW Flank
Target depth (mTVDSS)	2000m	1800m
Prospect Area (km^2)	10km^2	12.2km^2
POS_g	0.02	0.05
Volumes $10^6 Sm^3$ (MSV - P90 - P50 - P10)	3.32 - 0.99 - 2.73 - 6.33	3.45 - 1.17 - 2.89 - 6.38
Play	Upper Jurassic shoreface sands	
Objective	Ula Formation	
Key Risk	Charge and Seal	
Data Coverage	3D seismic data	

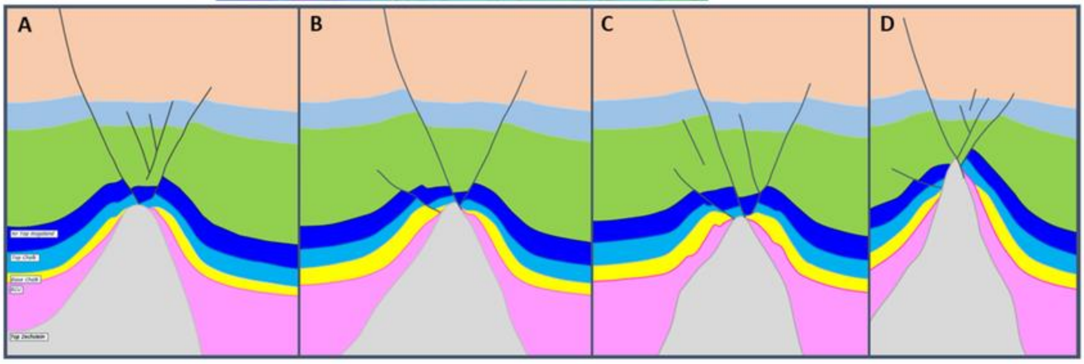


Fig. 8. Sgurr Alasdair North NE and SW Flank Overview
Clockwise from top left: structure map, showing the position of the geoseismic sections; migration paths into the prospect, and dry wells along the routes; prospect details table; geoseismic sections through the structure, highlighting faults penetrating the top seal, and pinching out of the stratigraphy onto the structure.

Prospect parameters are summarised in NPD format in Appendix A and B.

5. Technical Evaluations

Given the low POS and low prospect volume range no economic evaluation was undertaken, as it was apparent that no realisation would result in a commercially viable outcome. No further development planning studies were done.

6. Conclusions

The evaluation of the licence has concluded with the following view:

- Charge into the licence area is considered highly unlikely, with the Cassidy well (8/10-7S), that was drilled during the licence evaluation period, further increasing risk on charge, as well as reservoir for the identified prospects.

- Trap risk for the two parts of the anchor prospect, Sgurr Alasdair, is high, as faulting extends almost to seabed, and with steeply dipping structures that would require significant column heights to support an economic outcome.

- The model for reservoir has evolved during this evaluation, and this has resulted in increased risk of finding poor reservoir, analogous to that seen in the fields to the west of the licence.

All work commitments on the licence have been fulfilled, and a drill-worthy prospect has not been identified. Therefore, the partnership unanimously recommends the relinquishment of PL863/B.

7. Appendix

Appendix A

Block	8	Prospect name	Sgurr Alasdair N SW	Discovery/Prosp/Lead	Prospect	sp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)	No	Outside play (Y/N)	No				
Oil, Gas or O&G case:	Oil	Reported by company	A/S Norske Shell	Reference document				Assessment year	2019
This is case no.:	1 of 1	Structural element	SØRVESTLANDET I	Type of trap	Salt flank	Water depth [m MSL] (>0)	65	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)	2.44	4.00	6.90	12.70				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1.17	1.94	3.45	6.38				
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Callovian	Reservoir litho (from)	Sandnes Fm	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Mandal Fm	Seal, Chrono	Tithonian
Reservoir Chrono (to)	Tithonian	Reservoir litho (to)	Ula Fm	Source Rock, chrono secondary		Source Rock, litho secondary		Seal, Litho	Mandal Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.05	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)	0.75	Trap (P2) (0.00-1.00)	0.95	Charge (P3) (0.00-1.00)	0.15	Retention (P4) (0.00-1.00)	0.45		
Parametres:	Low (P90)	Base	High (P10)	*Prospect data for Sgurr Alasdair North SW Flank*					
Depth to top of prospect [m MSL] (> 0)		1800							
Area of closure [km^2] (> 0.0)	7.2	10.0	12.7						
Reservoir thickness [m] (> 0)	12	27	44						
HC column in prospect [m] (> 0)	401	515	652						
Gross rock vol. [10^9 m^3] (> 0.000)	0.029	0.048	0.146						
Net / Gross [fraction] (0.00-1.00)	0.61	0.71	0.80						
Porosity [fraction] (0.00-1.00)	0.18	0.20	0.23						
Permeability [mD] (> 0.0)	100.0	300.0	500.0						
Water Saturation [fraction] (0.00-1.00)	0.35	0.28	0.20						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0.79	0.83	0.88						
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)	84	90	96						
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.40	0.50	0.60						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0.40	0.50	0.60						
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)	80			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. Vsh<0.5	2.	3.					Kart nr	NPD will insert value

Appendix B

Block	8	Prospect name	Sgurr AlasdairN NE F	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)	No	Outside play (Y/N)	No				
Oil, Gas or O&G case:	Oil	Reported by company	A/S Norske Shell	Reference document				Assessment year	2019
This is case no.:		Structural element	SØRVESTLANDET I	Type of trap	Salt flank	Water depth [m MSL] (>0)	65	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)	2.05	3.89	6.63	12.50				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	0.99	1.76	3.32	6.33				
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Callovian	Reservoir litho (from)	Sandnes Fm	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Mandal Formation	Seal, Chrono	Tithonian
Reservoir Chrono (to)	Tithonian	Reservoir litho (to)	Ula Fm	Source Rock, chrono secondary		Source Rock, litho secondary		Seal, Litho	Mandal Formation
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.02	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)	0.75	Trap (P2) (0.00-1.00)	0.95	Charge (P3) (0.00-1.00)	0.07	Retention (P4) (0.00-1.00)	0.45		
Parametres:	Low (P90)	Base	High (P10)	*Prospect data for Sgurr Alasdair North NE Flank*					
Depth to top of prospect [m MSL] (> 0)		2000							
Area of closure [km^2] (> 0.0)	8.8	12.2	15.5						
Reservoir thickness [m] (> 0)	12	27	44						
HC column in prospect [m] (> 0)	201	316	452						
Gross rock vol. [10^9 m^3] (> 0.000)	0.024	0.077	0.144						
Net / Gross [fraction] (0.00-1.00)	0.61	0.71	0.80						
Porosity [fraction] (0.00-1.00)	0.18	0.20	0.23						
Permeability [mD] (> 0.0)	100.0	300.0	500.0						
Water Saturation [fraction] (0.00-1.00)	0.35	0.28	0.20						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0.79	0.83	0.88						
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)	85	90	96						
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.40	0.50	0.60						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0.40	0.50	0.60						
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)	84			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)	337			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 < 0.5	2.	3.					Kart nr	NPD will insert value

8. References

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