



PL1039/PL1039 B License Surrender Report

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1 License history

<u>License:</u>	PL1039/PL1039 B
<u>Location:</u>	Blocks 16&3, 16/6, 17/1 & 17/4
<u>Awarded:</u>	14.02.2020 and 19.02.2021
<u>License period:</u>	Expired 14.02.2022
<u>License group:</u>	Equinor Energy AS 60% (Operator) Total E&P Norge 40%
<u>License area:</u>	1165.762 km ²

Work obligations:

- Interpret the multiclient 3D seismic survey CGG18002
- Drill or drop decision date: 14.02.2022

Meetings held:

16.04.2020	EC/MC startup meeting
22.10.2020	EC/MC meeting no. 2
15.12.2020	EC work meeting
27.05.2021	EC/MC meeting no.3
09.11.2021	EC/MC meeting no. 4

Work performed:

2020:	Seismic interpretation, depth conversion, basin modelling, G&G evaluations
2021:	Prospect evaluation, Geophysical modelling of potential reservoir, AVO work, new local depth conversion, Inhouse FLEFF (Fluid Indication Detection) modelling.

Reason for surrender

The APA application was based on seismic mapping of 2D data, and the basin modelling on new source rock expulsion and migration concepts which were unproven, and still is.

The area is now covered by the new high quality multiclient broadband seismic survey CGG18M002. The main prospectivity are up-dip stratigraphic pinch-out traps of Late- to Middle Jurassic age. An extensive prospect evaluation has been conducted, including biostratigraphic re-analysis, AVO analysis, basin modelling, new detailed velocity modelling, as well as seismic modelling. Also, the new Equinor inhouse FLEFF AVO analysis tool has been tested over the license, unfortunately without success.

The updated volumes have been significantly reduced and the risks significantly increased since APA, due to the migration modelling, and the prospects being stratigraphic traps and not structural traps, as earlier mapped on 2D. The PL1039/PL1039 B partnership has thus decided to drop the licenses PL1039/PL1039 B.

2 Database overviews

2.1 Geophysical data

Table 1: Seismic database (see also Figure 1).

Seismic survey	2D/3D	Year
CGG18002	3D	2019

2.2 Well data

Table 2: List of wellbores in the common license database (see also Figure 1).

Well	Year	Drilling operator	Current license	Status	Age at TD
16/2-22S	2017	Statoil Petroleum AS	265	Oil	Basement
16/2-U-18	2016	Statoil Petroleum AS	501	Oil shows	Triassic
16/5-6	2016	Tullow Oil Norge AS	776	Dry	Triassic
25/11-28	2015	Statoil Petroleum AS	169	Dry	Basement
26/10-1	2015	Lundin Norway AS	674 BS	Gas	Early Miocene
16/2-20A	2014	Lundin Norway AS	501	Oil shows	Basement
16/2-18S	2013	Statoil Petroleum AS	265	Oil	Pre-Devonian
16/3-7	2013	Lundin Norway AS	501	Oil shows	Permian
16/2-7	2011	Lundin Norway AS	501	Oil	Permian
17/6-1*	2011	Norwegian Energy Company ASA	545	Oil shows	Late Triassic
16/2-4	2007	StatoilHydro ASA	265	Oil/gas	Pre-Devonian
17/3-1	1995	Elf Petroleum Norge AS	188	Gas	Pre-Devonian
25/11-17	1993	Norsk Hydro Produksjon AS	169	Dry	Pre-Devonian
16/3-3	1989	Esso exploration and Production Norway A/S	149	Dry	Late Cretaceous
16/3-2	1976	Norsk Hydro Produksjon AS	007	Dry	Pre-Devonian
17/9-1R	1974	Esso exploration and Production Norway A/S	002	Dry	Late Triassic
25/12-1	1973	A/S Norske Shell	010	Dry	Devonian
16/5-1	1971	Elf Petroleum Norge AS	007	Dry	Pre-Devonian
25/8-1	1970	Esso exploration and Production Norway A/S	027	Oil	Early Permian
16/6-1	1968	Elf Petroleum Norge AS	007	Dry	Pre-Devonian
17/4-1*	1968	Elf Petroleum Norge AS	007	Dry	Early Permian
16/2-1	1967	Esso exploration and Production Norway A/S	001	Oil shows	Pre-Devonian

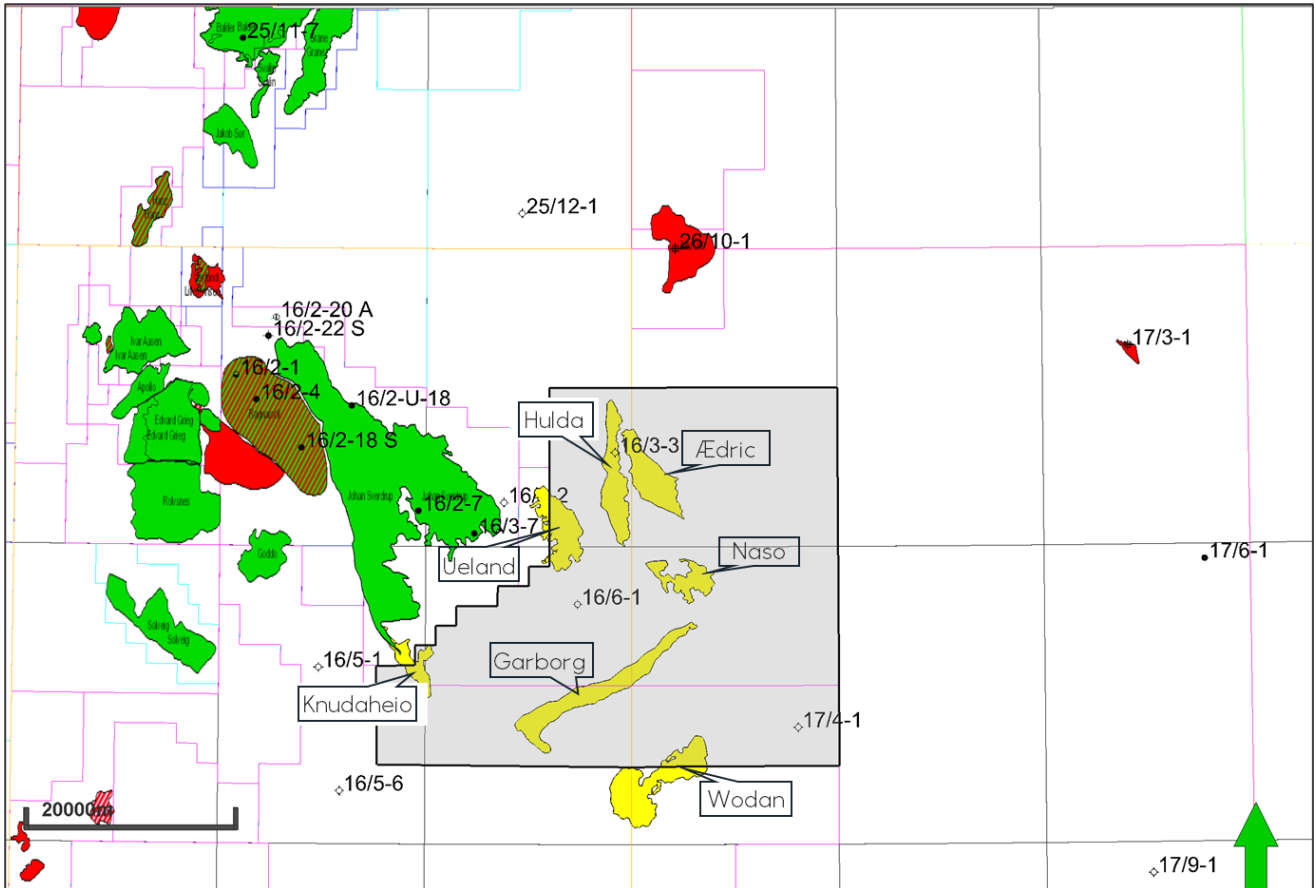


Figure 1: Prospectivity, and seismic and well common database for PL1039/PL1039 B. Seismic CDB being the CGG18002 within the license area, marked in grey.

3 Results of geological and geophysical studies

The prospects (Figure 2), when mapped out on new 3D data, all showed to be stratigraphic pinch-out traps. New basin modelling for the area indicates that the main migration route from the Asta Graben is going in an eastward direction, away from instead of into the PL1039/PL1039 B licenses. The fetch area for the source rock is also not situated in a favourable position for licenses PL1039/PL1039 B. This gives a considerable risk for both trap seal, source presence and -migration, resulting in a low Pg (Table 3).

The following G&G studies have been performed:

- Seismic data quality and conditioning study
- Seismic interpretation on CGG18002
- Depth conversion study
- Basin modelling study
- Geophysical modelling
- Biostratigraphy
- Inhouse FLEFF (Fluid Indication Detection) modelling

The depositional model is in general that sands have been shed off from the Johan Sverdup plateau by gravity flows and/or deposited as shallow marine sand deposits. However, geophysical modelling of the possibility of having reservoir within the Heather Formation in Garborg (Figure 2 & 3), and Naso, has been modelled with the result that the lithology in Garborg and Naso most likely is Heather shale with little or thin intra Heather sandstones. Also, geophysical modelling of having potential Ran sandstones in the Knudaheio prospect (Figure 2), indicates that this is highly unlikely. The presence of reservoir is therefore a relatively high risk for these prospects.

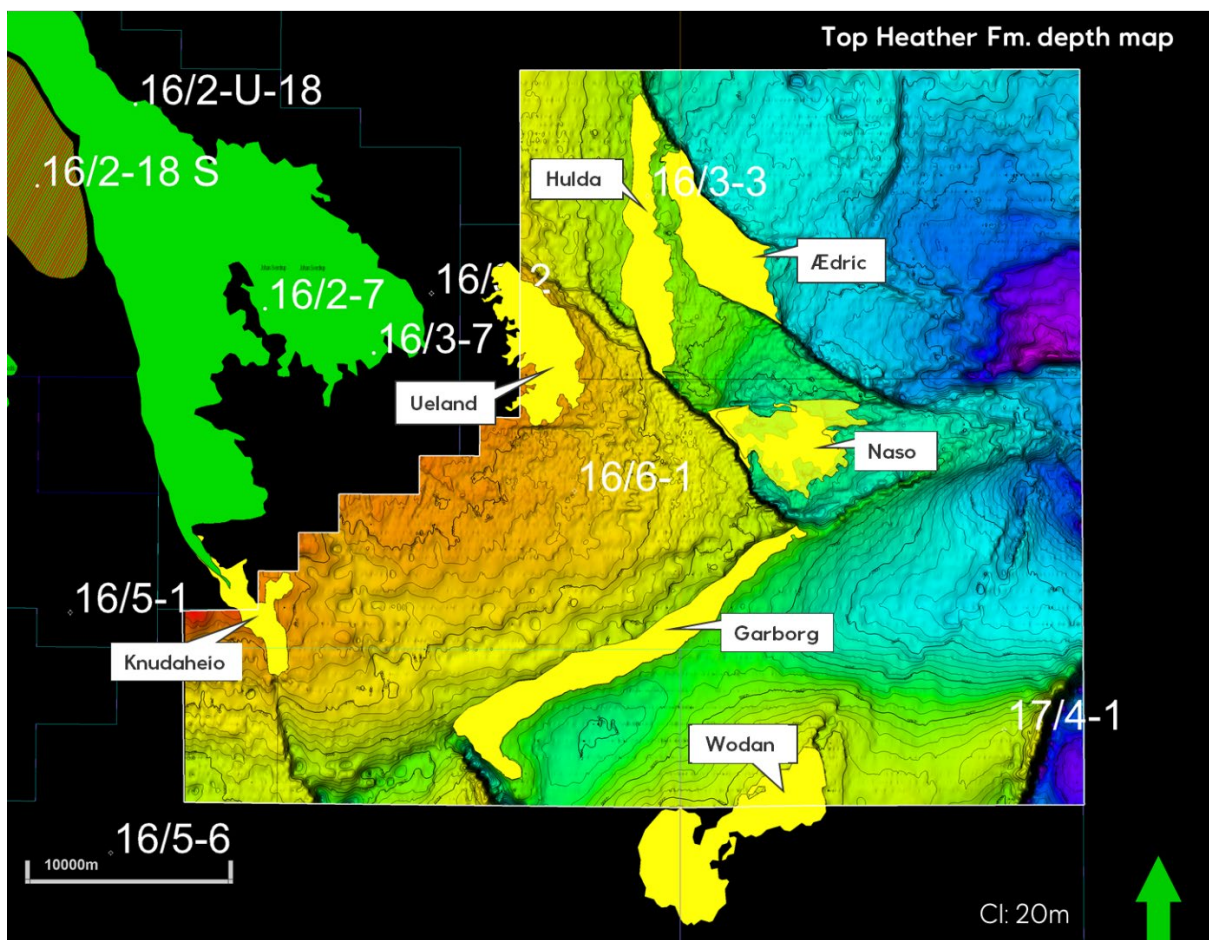


Figure 2: Top Heather depth map with location of the PL1039/PL1039 B prospects.

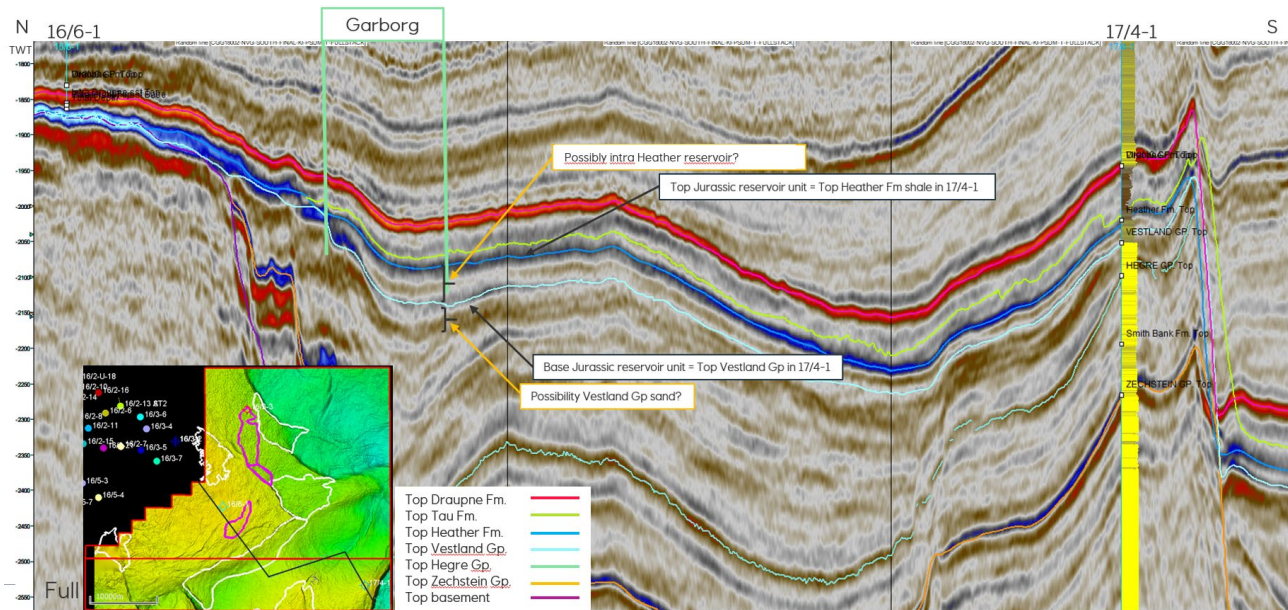


Figure 3: Seismic section through Garborg prospect and well 17/4-1, showing the tie to well 17/4-1, and indicating the pinch-out of Garborg trap through the relay ramp.

4 Prospect update report

Prospect evaluation has been carried out for many levels within PL1039/PL1039 B. Unfortunately, all prospects carry a very low Pg. Therefore, the prospectivity is considered non-economic. See Table 3 & 4 for volumes and risks.

Table 3: In-place and recoverable resources for prospects in PL1039/PL1039 B.

Prospects	GeoX ID	Prospect/lead	Age	Formation	Undiscovered	In-place res. (MSm3 o.e.) Total resources, Total Structure			Recoverable res. Oil (MSm3) 100%, Total Structure			Recoverable res. Ass. Gas (GSm3) 100%, Total Structure			Pg %
						P90	Mean	P10	P90	Mean	P10	P90	Mean	P10	
16/3 Hulda	739241	Prospect	Mid- Early Jurassic	Vestland/Statfjord	Oil case	9,61	22,70	38,10	3,68	8,82	14,70	0,16	0,39	0,66	8,0
16/6 17/4 Garborg	739239	Prospect	Late Jurassic	Intra Heather	Oil case	9,83	35,00	69,90	3,76	13,50	27,10	0,16	0,59	1,19	4,2
17/4 Naso (U. + M.)	739240	Prospect	Late + Mid Jurassic	Intra Heather	Oil case	7,13	27,30	53,50	3,05	11,70	23,20	0,15	0,61	1,21	8,6
16/3 Ueland	741347	Prospect	Late Jurassic	Intra Draupne	Oil case	10,00	31,60	60,90	4,86	15,30	29,20	0,18	0,59	1,14	8,4
17/1 Ædic	741474	Prospect	Mid- Early Jurassic	Vestland/Statfjord	Oil case	10,10	31,50	57,50	4,26	13,50	24,90	0,21	0,70	1,31	5,3
17/4 Wodan	741602	Prospect	Mid Jurassic	Vestland	Oil case	5,33	22,30	45,30	2,04	8,63	17,30	0,09	0,38	0,77	8,6
16/5 Knudaheio	739242	Prospect	Early Cretaceous	Ran	Oil case	9,67	18,20	29,60	4,54	8,63	14,20	0,14	0,45	0,75	10,7

Table 4: Risks for prospects in PL1039/PL1039 B.

Prospects/segments	P-play			P-Prospects/Segment						Discovery Pg
	Reservoir	Source	Trap	Reservoir		Source		Trap		
				presence	producibility	presence	migration	geometry	seal	
16/3 Hulda	1	1	1	0,75	1	0,7	0,5	1	0,3	8,0
16/6 17/4 Garborg	1	1	1	0,5	1	0,7	0,4	1	0,3	4,2
17/4 Naso (Upper)	1	1	1	0,5	1	0,7	0,5	1	0,3	5,3
17/4 Naso (Mid-Lower)	1	1	1	0,5	1	0,7	0,3	1	0,5	3,8
16/3 Ueland	1	1	1	1	1	0,7	0,3	1	0,4	8,4
17/1 Ædric	1	1	1	0,5	1	0,7	0,5	1	0,3	5,3
17/4 Wodan	1	1	1	0,8 / 0,6	1	0,3	0,5	1	0,8	8,6 / 6,5
16/5 Knudaheio	1	1	1	0,3	1	1	0,9	1	0,4	10,7

5 Technical evaluation

The prospects within PL1039/PL1039 B were evaluated as potential subsea tie-backs to the Johan Sverdrup platform.

6 Conclusion

The work program for PL1039/PL1039 B has been completed with extensive G&G work. An extensive prospect evaluation has been conducted, including biostratigraphic re-analysis, AVO analysis, basin modelling, new detailed velocity modelling, as well as seismic modelling. Also, the new FLEFF AVO analysis tool has been tested over the license, unfortunately without success.

The updated volumes have been significantly reduced and the risks significantly increased since APA, mainly due to the migration modelling, and the prospects being stratigraphic traps and not structural traps, as earlier mapped on 2D. Therefore, the PL1039/PL1039 B partnership have decided to drop the licenses.