

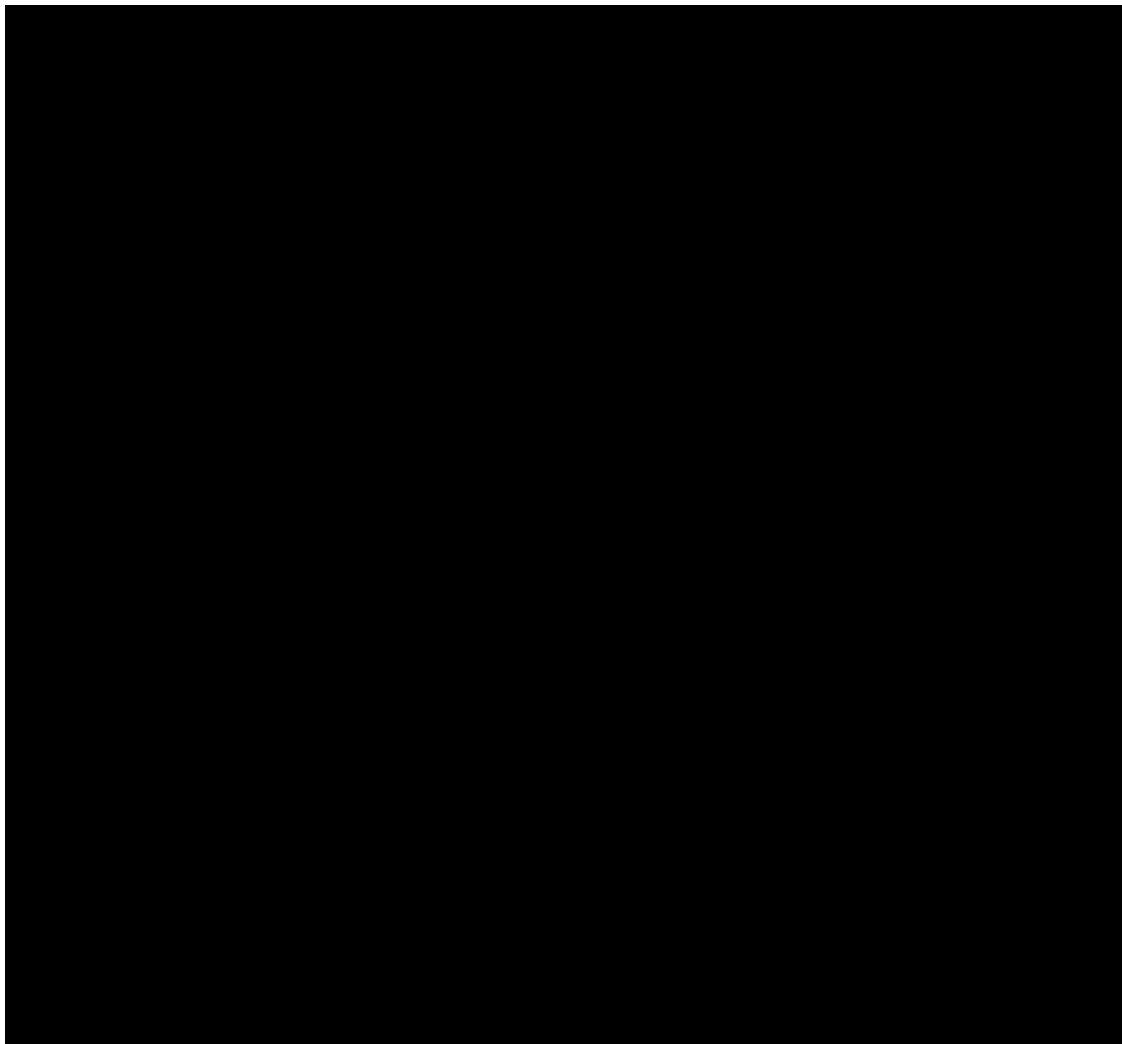


PL 793 - Licence status report

Summary

The PL793 licence is located to the southeast of the Njord field and was previously a part of the former PL512 licence. Prior the PL512 parts of the licence was licenced to various former licences: PL107, PL132, PL158, PL176, PL347, PL349. Shell was initially the operator of the licence and drilled well 6407/10-5 Portrush which was dry. 28.09.2018 Equinor took over the operatorship of the licence. The driving prospectivity with Equinor as operator has been the lower Jurassic Tonje Glimmerdal prospect in the westernmost part of the Froan basin.

An updated evaluation of parts of PL793 prospectivity, based on interpretation of the results in PL751 6407/11-1 Gunnvald, was carried out. The driving PL793 Tonje Glimmerdal prospect was evaluated to get a downgrade for the seal risk, and a minor upgrade for the migration risk based on the Gunnvald well results. The ultimate impact is a downgrade of the Tonje Glimmerdal prospect. Additional prospectivity was also evaluated, but no prospects with sufficiently attractive volume and risk were found. Based on this, the PL793 partnership did not see any attractive drilling candidates in PL793 and have unanimously decided to drop the licence



PL 793 - Licence status report

Doc. No.
AU-EXP NUKE NWS-00169

Valid from:
2020-02-03

Rev. no. 1

Figure 1: Area map with PL793 licence outlined in red, Njord, Bauge, Hyme, Draugen fields, prospects and surrounding discoveries.

Table of contents

Contents

1	Licence history	5
2	Database overviews	7
2.1	Seismic data	7
2.2	Well data	7
3	Results of geological and geophysical studies (max 2 pages)	8
4	Prospect update report (max 3 pages)	8
5	Technical evaluation (max 1 page)	11
6	Conclusion (max 1 page)	12

1 Licence history

<u>Licence:</u>	PL793	
<u>Awarded:</u>	06.02.2015 (APA2014)	
<u>Licence period:</u>	Expires 06.02.2022 Initial period: 7 years	
<u>Licence group:</u>	Equinor Energy AS	50% (Operator from 28.09.2018)
	Petoro AS	20%
	DNO North Sea (Norge AS)	20%
	Neptune Energy Norge AS	10%
<u>Licence area:</u>	227.012 km ²	
<u>Work programme:</u>	Technical G&G work	- Fulfilled
	Purchase 3D seismic	- Fulfilled
	Drill 6407/10-5 Portrush	- Fulfilled
	Re-process PGS14005 as SH16M01	- Fulfilled
	Assessment of remaining prospectivity	- Fulfilled
	Implement 6407/11-1 Gunnvald well results	- Fulfilled
	Initial BoK or Drop by 06.02.2018	- Applied for one year extension
	Extended BoK or Drop by 06.02.2019	- Applied for one year extension
	Extended Drill or Drop by 06.11.2019	- Decision made to drop the licence
<u>Meetings held:</u>		
12.03.2015	EC/MC meeting #1	
12.05.2015	EC work meeting #1	
17.06.2015	MC work meeting #1	
18.06.2015	EC work meeting #2	
29.06.2015	MC work meeting #2	
01.07.2015	MC work meeting #3	
10.08.2015	MC work meeting #4	
11.08.2015	MC work meeting #5	
12.08.2015	MC work meeting #6	
14.08.2015	EC work meeting #3	
18.08.2015	EC work meeting #4	
22.10.2015	EC/MC meeting #3	
10.05.2016	EC work meeting #5	
20.09.2016	EC work meeting #6	
15.11.2016	EC/MC meeting #4	
28.11.2016	EC work meeting #7	
22.09.2017	EC work meeting #8	
06.10.2017	EC work meeting #9	
17.11.2017	EC/MC meeting #5	
30.10.2018	EC/MC meeting #6	
25.10.2019	EC work meeting #10	

31.10.2019 EC/MC meeting #6

Work performed:

- 2015: Licence start-up. A seismic remigration of DN0902DNR12 was performed resulting in DN0902SHR15. 1106 km² of PGS14005 PSTM was purchased by the licence partners and included in the licence database. A drill decision for an exploration well was approved in the licence and site survey and well planning performed. Well 6407/10-5 was drilled on the Portrush prospect which was dry
- 2016: Post well studies performed on data from 6407/10-5. Mapping of remaining prospectivity in the licence. Seismic reprocessing of PGS16005 started. Mapping of remaining prospectivity.
- 2017: Seismic reprocessing delivered as SH16M01. Prospectivity remapped on reprocessed seismic including AVO analysis.
- 2018: Change of operator from Shell to Equinor. Remapping of prospectivity with focus on Lower Jurassic in the Froan basin which had the potential to be derisked by the planned well 6407/11-1
- 2019: Evaluate impact on prospectivity from the dry 6407/11-1 Gunnvald
Decision made to drop the licence.

Reason for surrender:

The initial focus in the licence was the upper Jurassic play resulting in drilling of the dry well 6407/10-5. Several iterations with reevaluation of the remaining prospectivity to seek to mature an additional drilling candidate has been performed. After the change of operator, Equinor has had the lower Jurassic Tonje Glimmerdal in the Froan Basin as the driving prospect. An update of the prospectivity, based on interpretation of the results in PL751 6407/11-1 Gunnvald, was carried out. The Tonje Glimmerdal prospect was evaluated to get a downgrade for the seal risk, and a minor upgrade for the migration risk based on the Gunnvald well results. The ultimate impact is a downgrade of the Tonje Glimmerdal prospect. Additional prospectivity was evaluated but no prospects with sufficient volume and risk were found. Based on this, the PL793 partnership did not see any attractive drilling candidates in and have unanimously decided to drop the licence.

2 Database overviews

The PL793 licence common database was approved after ECMC meeting #1.

2.1 Seismic data

The seismic data that was utilized in the PL793 technical evaluations are shown in Table 1.

Table 1: Seismic and electromagnetic data included in the PL793 common database

Survey	NPDID	TYPE	Quality
PGS14005 (parts, 1106 km2)	8054	3D	Good
SH16M01 (reprocessed)		3D	Good
DN0902DNR12	7044	3D	Good
DN0902SH15		3D	Good
ORG14253 DNME	8058	2D	

2.2 Well data

The well database utilized in the PL793 technical evaluations area shown in Table 2.

Table 2: Wells included in the PL793 common database

Well	NPDID	Well	NPDID
6406/11-1 S	1539	6407/8-2	2434
6406/12-1 S	1711	6407/8-3	3092
6406/12-2	2640	6407/8-5S	6110
6407/7-1 S	474	6407/8-6	7265
6407/7-2	1017	6407/9-10	4710
6407/7-3	1229	6407/9-9T2	1990
6407/7-4	1360	6407/10-1	1054
6407/7-5	1699	6407/10-2	1497
6407/7-6	4172	6407/10-3	1927
6407/7-7S	5550	6407/12-1	3781
6407/8-1	1859		

3 Results of geological and geophysical studies

6407/10-5 Portrush

Well 6407/10-5 was drilled on the Portrush prospect, southeast of the Njord Field. The primary objective was to prove oil in the Upper Jurassic sequence (Rogn Formation) in a hanging wall trap downthrown of the Vingleia Fault Complex. The secondary objective was to evaluate potential Melke Formation reservoirs. The well drilled 330 m into the Rogn and Melke Fms with 134 m of good to moderate reservoir quality. TD was set within the Melke Fm. The well was dry.

6407/10-5 Post well studies

Post well studies including for 6407/10-5 including biostratigraphy and geochemistry have been performed. The results find no evidence for migrated hydrocarbons and indicates that the well is situated in a migration shadow.

Seismic reprocessing

A seismic reprocessing of the datasets PGS14005 was done, data from DN0902 and NH9702 was used for infill over the Njord field. An anisotropic velocity model was used and with PSDM Kirchhoff and enhanced Kirchhoff with angle stacks were derived. The new reprocessing was named according to Shell nomenclature as SH16M01 and covered the licence database.

4 Prospect update report

The Portrush post well prospectivity – Shell operator

After drilling of 6407/10-5 Portrush, a reevaluation of the prospectivity in the licence was performed by Shell as the operator at the time. Upper Jurassic prospectivity related to the Vingleia fault complex and Triassic prospectivity on the Frøya High was the main focus. A reevaluation after finalizing the seismic reprocessing was done, but no prospects were recommended as drill candidates.

Tonje Glimmerdal prospect

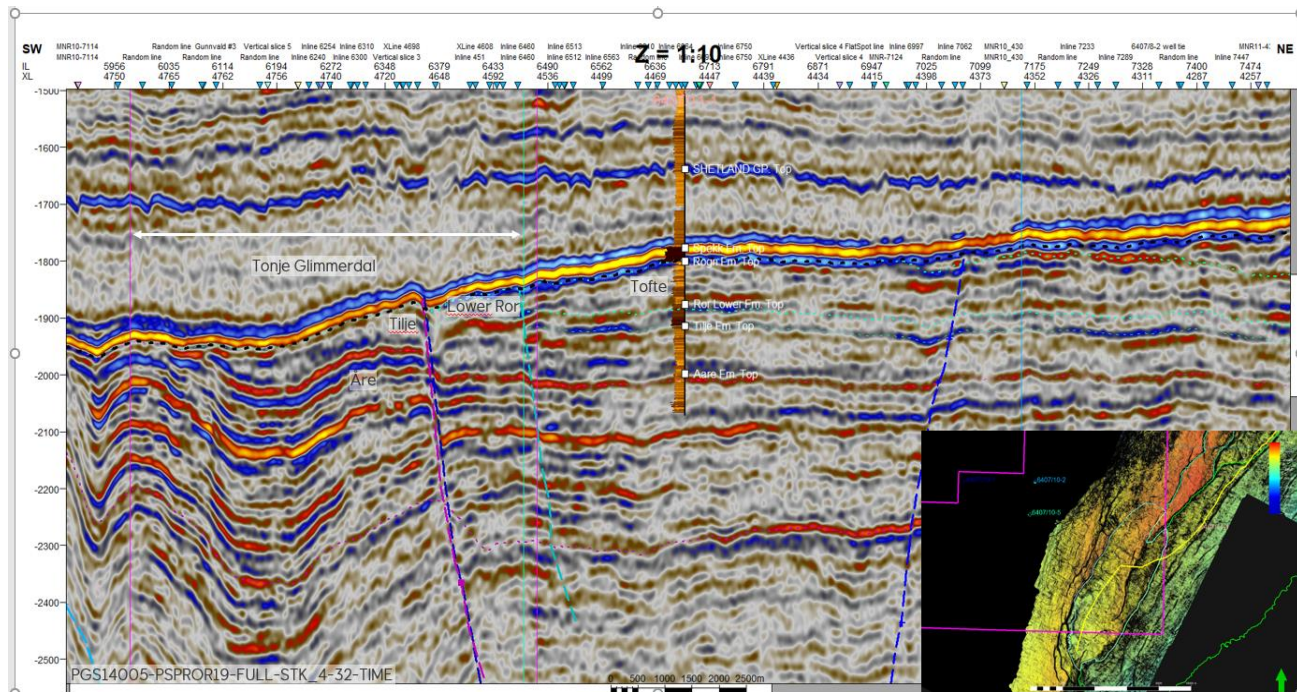
The Tonje Glimmerdal prospect is a combined structural and stratigraphic trap with stacked reservoirs in the Tilje (Tonje segment) and Åre (Glimmerdal segment) Fms. The prospect was viewed as attractive follow up potential given a success in the Gunnvald well in the neighbouring PL751. The top seal is the upper Jurassic Spekk and/or Cretaceous shales above an upper Jurassic unconformity. The trap concept includes fault membrane seal against Triassic Fms to the west, lowermost Jurassic Åre Fm. to the north and Tofte Fm toward the east. The main risk was initially migration. Long distance migration from a mature Spekk source rock in the Gimsan basin, through the Bremstein fault complex and into the Froan basin is proposed as the most likely model. The trap seal risk was also considered as a significant risk. After the well results from 6407/11-1 Gunnvald, the main risk has shifted from migration to trap seal. The trap seal risk is related to possibly synrift sandstones above the upper Jurassic unconformity breaching the top seal and fault seal risk related to potential juxtaposition versus the waterfilled reservoir in 6407/11-1. Based on previous discoveries in the area both oil and gas are possible phases, but oil is considered the most likely phase.

Geophysical anomalies have been evaluated in the area around the prospect. A possible flat event is observed in an area of the Tonje segment (Tilje formation). AVO class-3 amplitude anomalies with partial depth conformance are observed for the Tonje and Glimmerdal segments. The anomalies do not cover the entire segments. The prospect is evaluated a small DHI downgrade for the Tonje segment (Tilje Fm.), while Glimmerdal (Åre fm.) is recommended as neutral.

After the drilling of 6407/11-1 Gunnvald the prospect has been reevaluated. The main changes are a worsened trap seal risk and a slightly improved migration risk (due to the observed oil shows). In addition, the upside volume potential has been reduced due to an exposure to water filled Tofte Fm observed in the well. The overall conclusion is a less attractive prospect.

UNDISCOVERED	Prospect segments	In-place res. (MSm ³ oe) 100%, Total Structure			Recoverable res. (MSm ³ oe) 100%, Total Structure		
		P90	Mean	P10	P90	Mean	P10
<i>Pre drill prospect aggregated</i>	Tonje Glimmerdal	1,3	25,4	74,9	0,6	9,0	27,1
<i>Pre drill segment</i>	Tonje	2,2	20,2	57,0	1,0	7,4	22,3
<i>Pre drill segment</i>	Glimmerdal	0,2	10,2	31,9	0,0	2,8	9,8
<i>Post drill prospect aggregated</i>	Tonje Glimmerdal	1,4	15,8	40,5	0,5	5,1	12,8
<i>Post drill segment</i>	Tonje	3,1	15,5	36,8	1,2	5,4	12,7
<i>Post drill segment</i>	Glimmerdal	0,2	5,8	17,5	0,1	1,5	4,3
Comments	Post drill evaluation not formally QC'ed						

	Prospect segments	P-Play			P-Prospect/Segment							Discovery	
		Res	Source	Seal	Reservoir		Source			Trap		Pg	Pg (DFI)
					pre-sence	produc-tion	pre-sence	migra-tion	hc-phase	geo-metry	seal		
Pre Gunnvald	Tonje	1,00	1,00	1,00	1,00	1,00	1,00	0,40	1,00	1,00	0,50	0,20	0,16
	Glimmerdal	1,00	1,00	1,00	1,00	1,00	1,00	0,40	1,00	1,00	0,50	0,20	0,20
	Tonje Glimmerdal aggregated												0,22
Post Gunnvald No QC	Tonje	1,00	1,00	1,00	1,00	1,00	1,00	0,60	1,00	1,00	0,30	0,18	0,14
	Glimmerdal	1,00	1,00	1,00	1,00	1,00	1,00	0,60	1,00	1,00	0,30	0,18	0,14
	Tonje Glimmerdal aggregated												0,18



Additional prospectivity

Upper Jurassic prospectivity in the Vingleia fault complex has been mapped, but no detailed evaluation has been performed due to small areal coverage.

The Idun/Eir prospect in a neighbouring fault segment to Tonje Glimmerdal has been evaluated, but the majority of the potential volume is situated in the neighbouring PL751 licence.

The prospectivity in Upper Jurassic and Triassic mapped by Shell has operator has not been remapped by Equinor. However, the main conclusion that no attractive drilling candidate are found prevails.

5 Technical evaluation

A technical evaluation of the Portrush prospect was done prior to the decision to drill. The evaluated solution for an oil discovery was a subsea tie back to the Draugen platform with 6 producers and two water injectors. When Equinor took over the operatorship a technical evaluation of the current driving Tonje Glimmerdal project was done. Development of an oil discovery was evaluated as a subsea tieback to the Njord platform with 6 oil producers with gas lift and 3 water injectors

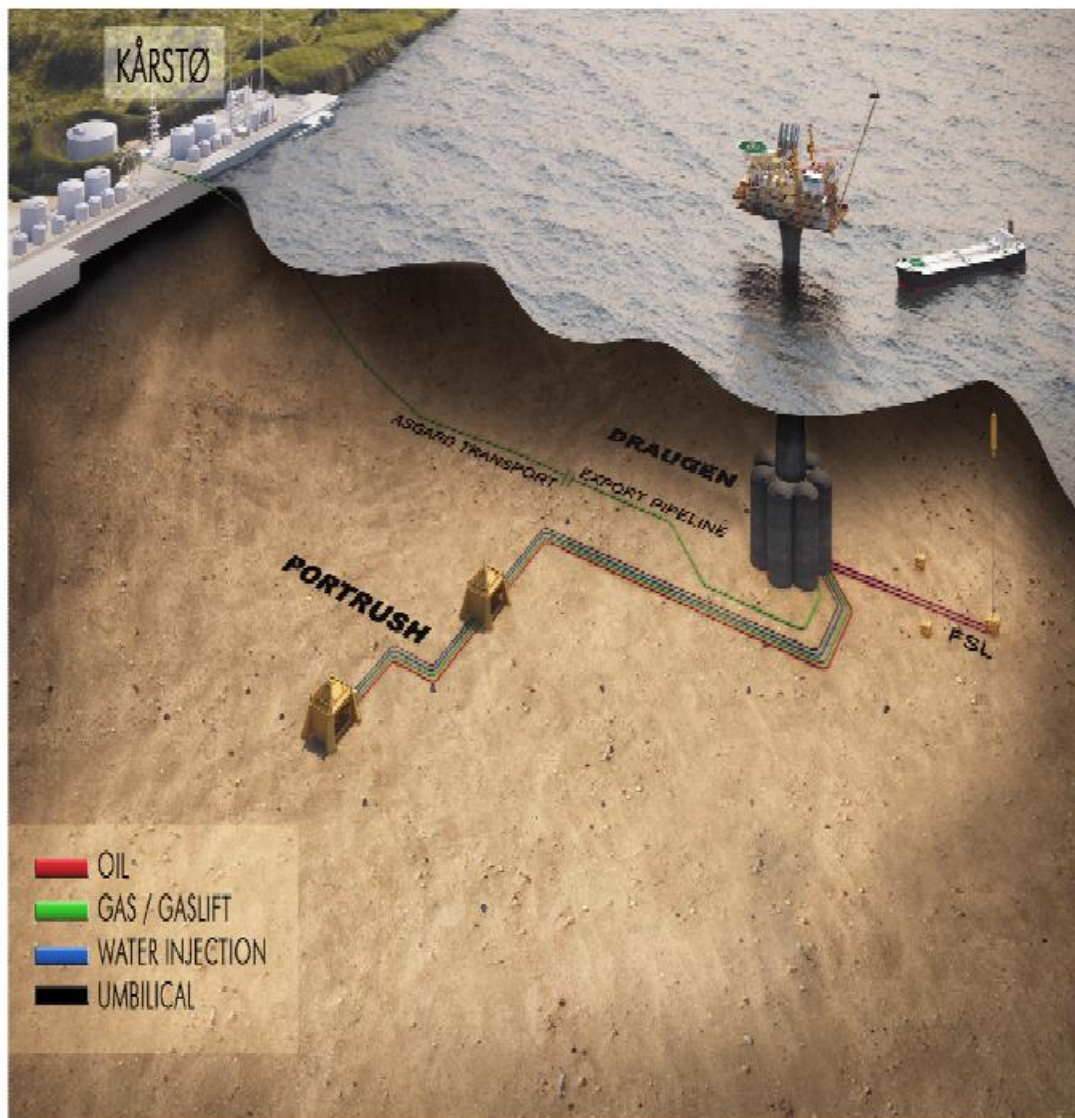


Figure 1 Field development solution evaluated prior to drilling of the Portrush well

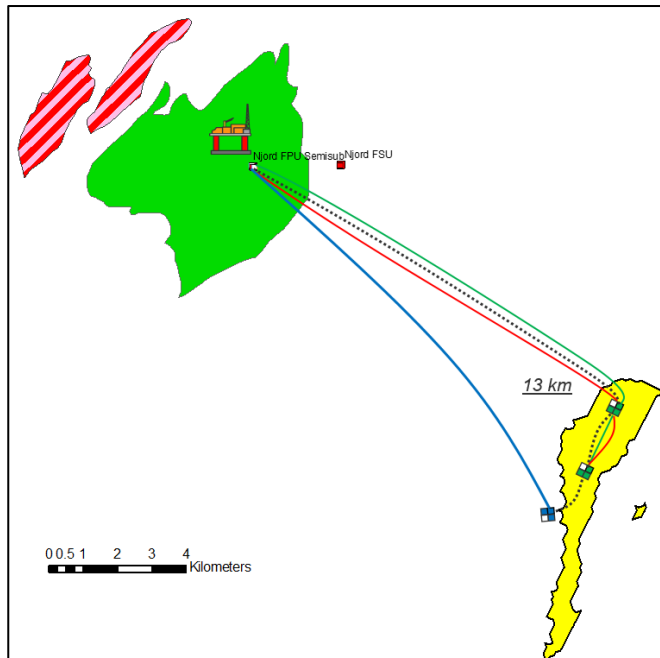


Figure 2 The field development solution for the P50 oil case volume (pre Gunnvald well data) evaluated for the Tonje Glimmerdal prospect.

6 Conclusion

The focus for the prospectivity in PL793 has shifted over time. Initially the focus was on the upper Jurassic synrift prospects resulting in the drilling of 6407/10-5 Portrush. The well was dry and as the next step the prospectivity in the licence was reevaluated by operator Shell, without leading to a drill recommendation. In 2018, Equinor took over the operatorship and reevaluated the licence focussing on lower Jurassic prospectivity as potential follow up of the planned 6407/11-1 Gunnvald well. After the well was drilled, PL793 prospectivity was reevaluated and the driving prospect Tonje Glimmerdal was downgraded. No other attractive drilling candidates have been found and the licence decided unanimously to drop the licence.