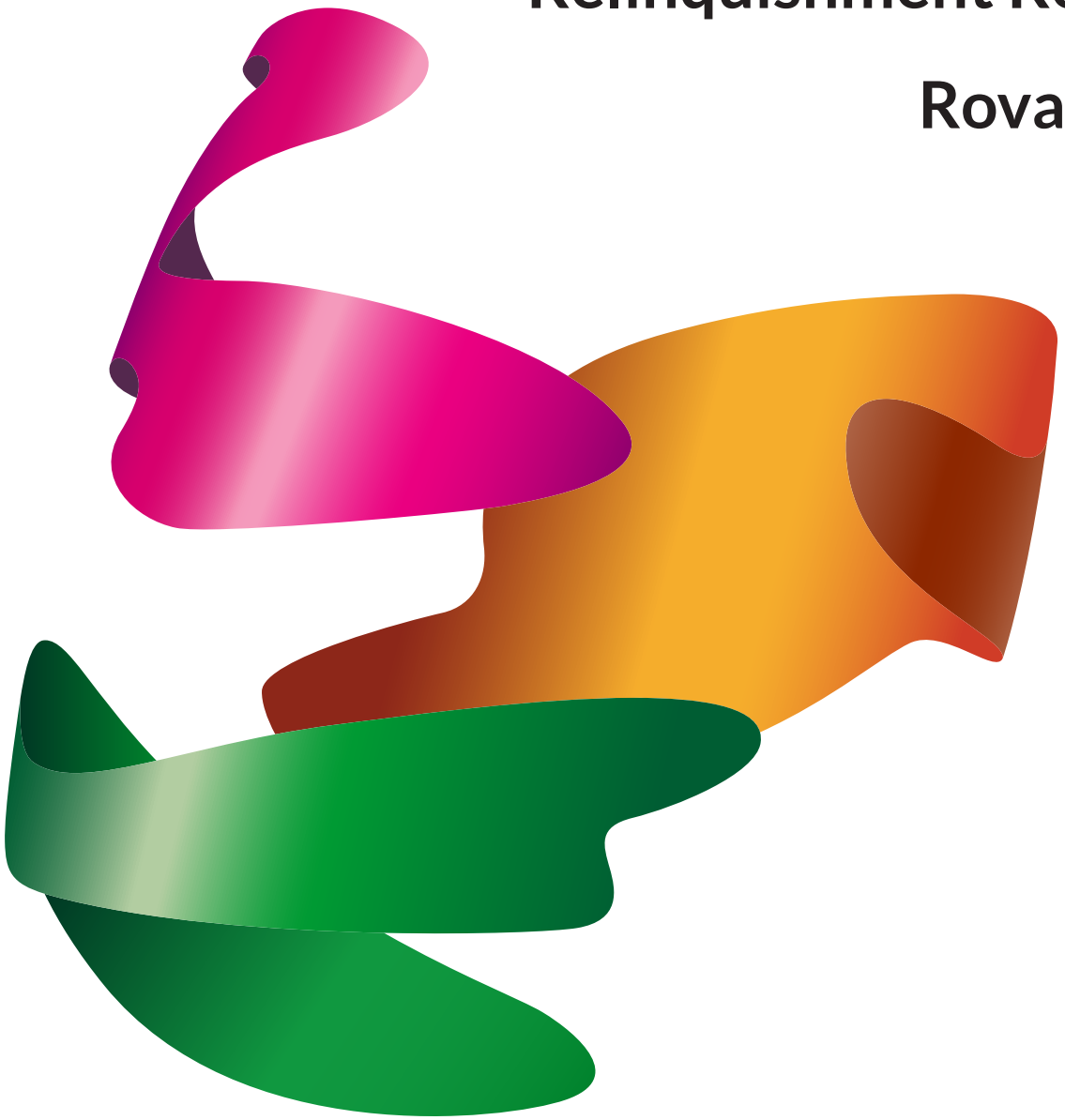
AkerBP

PL 626

Relinquishment Report

Rovarkula



Partners:

ConocoPhillips

MOL

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1 Introduction

1.1 License Group

Aker BP ASA 60 % (Operator)

ConocoPhillips Skandinavia AS 30 %

MOL Norge AS 10 %

1.2 Award and work program

Production license 626 was awarded in the APA 2011 Round, 03.02.2012, with a drill or drop decision within 2 years and an initial period of 7 years.

An application was forwarded 04.11.2013, applying for extension of the current deadlines with one year. In a letter dated 20.01.2014 MPE (ref. 13/1845) approved a six month extension of the current deadlines. New deadlines being Decision to drill 03.08.2014, Decision to concretize (BOK) 03.08.2016, Decision to continue (BOV) 03.08.2018, Decision to submit PDO 03.08.2019 and Expiry of initial period 03.08.2019.

MPE was in a letter dated 24.07.2014 informed about the unanimously decision to drill an exploration well in the license. The Rovarkula exploration well (25/10-15 S) was drilled with the JU Maersk Interceptor in the period 17.07.2016 to 02.08.2016. The Rovarkula exploration well was dry.

An application was forwarded 02.06.2016, applying for extension of the current Decision to concretize (BOK) deadline with one year. In a letter dated 30.06.2016 MPE (ref. 16/2453) approved a nine month extension of the Decision to concretize (BOK) deadline. New deadline being Decision to concretize (BOK) 03.05.2017.

An application was forwarded 03.05.2017, applying for extension of the current Decision to concretize (BOK) deadline with one year and nine months, and the other deadlines with one year and six months. In a letter dated 13.10.2017 MPE (ref. 16/2453) approved a nine month extension of the current Decision to concretize (BOK) deadline, and a six month extension of the other deadlines . New deadlines being Decision to concretize (BOK) 03.02.2018, Decision to continue (BOV) 03.02.2019, Decision to submit PDO 03.02.2020 and Expiry of initial period 03.02.2020.

An application was forwarded 10.01.2018, applying for extension of the current Decision to concretize (BOK) deadline with one year. In a letter dated 20.03.2018 MPE (ref. 16/2453) approved the application. New deadline being Decision to concretize (BOK) 03.02.2019

The initial partners in the license were Det norske oljeselskap ASA (50 % and operator), Spring Energy Norway AS (30 %), and Fortis Petroleum Norway AS (20 %). In 2013, Tullow Oil Norge AS acquired the 30 % share from Spring Energy. In 2014, Ithaca Petroleum Norge AS, to become MOL Norge AS in 2015, acquired a 10 % share from Fortis Petroleum Norway AS. In 2016, Det norske oljeselskap ASA became Aker BP ASA, while in 2017 ConocoPhillips Skandinavia AS acquired the 30 % share from Tullow Oil Norge AS. In 2018, Aker BP ASA acquired the remaining

10 % share from Fortis Petroleum Norway AS, eventually making the license group relinquishing PL 626 Aker BP ASA - 60 % (O), ConocoPhillips Skandinavia AS - 30 % (P) and MOL Norge AS - 10 % (P).

The initial PL 626 work obligations were:

1. Acquiring and reprocessing 3D seismic
2. G&G Studies
3. Drill or Drop decision within 2 years (drill decision taken after being granted 6 months extension)
4. BOK within 2 years (granted extension of a total of 3 years until 03.02.2019)

The work obligations have been fulfilled, with a unanimous decision to relinquish at the BOK gate.

1.3 Identified Prospectivity

PL 626 is located in the northern part of the Gudrun Terrace, between the Utsira High and Vana Sub-Basin (Fig. 1.1). The license covers part of block 25/10, west of the Balder & Ringhorne Fields and north/north-west of the Hanz Discovery.

Several prospects and leads were/are identified in the license. They include the Rovarkula Prospect (Middle-Upper Jurassic, driilled by 25/10-15 S and proven dry with no shows), Ramstadslottet Prospect (Paleocene), Kampen Prospect (Triassic, Middle-Upper Jurassic), Fjøløy Prospect (Upper Jurassic) , Putåsen Lead (Paleocene), Rovarkula W Lead (Middle Jurassic), Rughaug Lead (Paleocene), Fowler Lead (Paleocene), Haukåsen Lead (Triassic, Middle-Upper Jurassic) and Svartåsen Lead (Upper Jurassic). All prospects and leads are shown in Fig. 1.2.

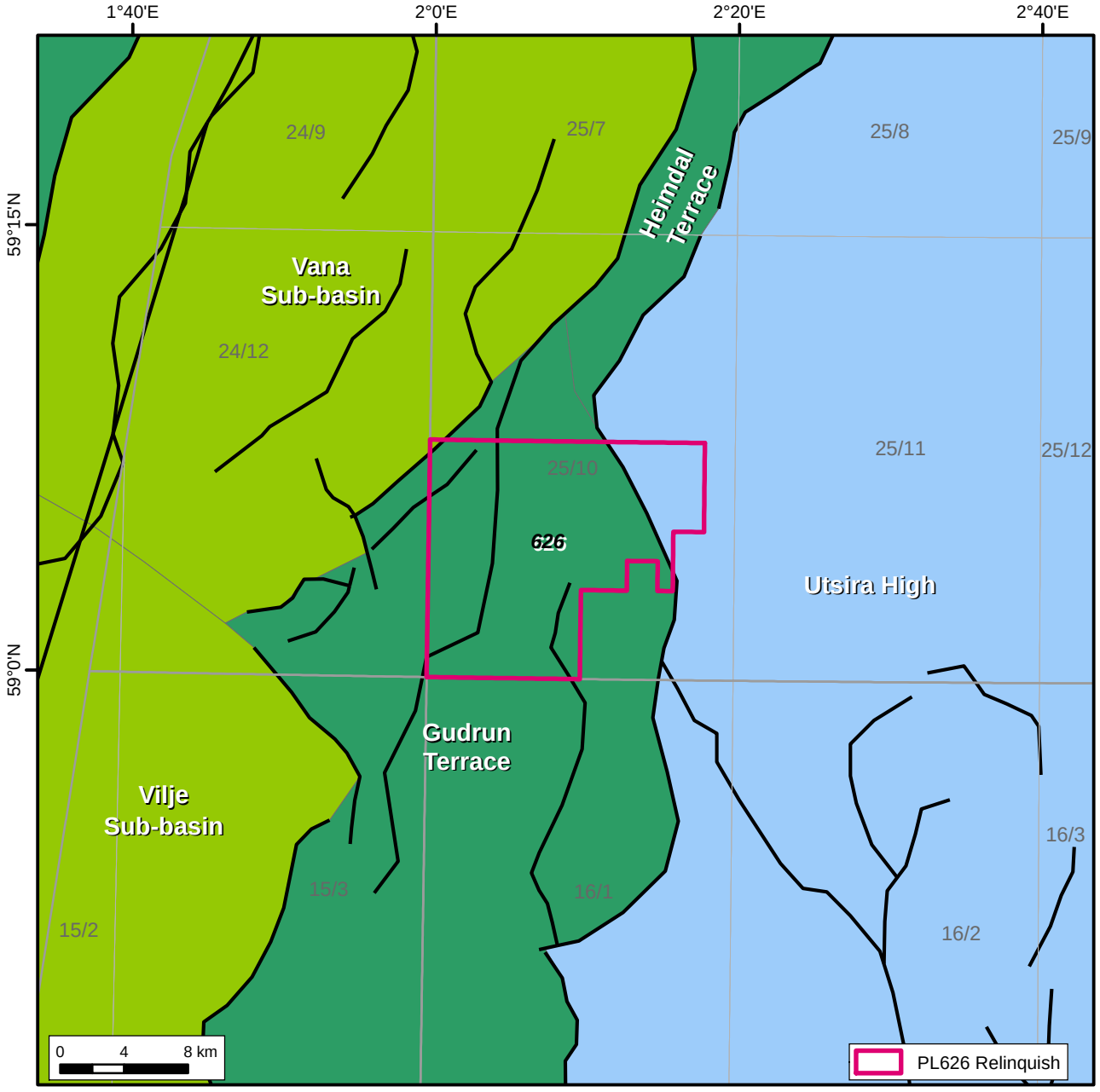


Fig. 1.1 Structural map with location of PL 626

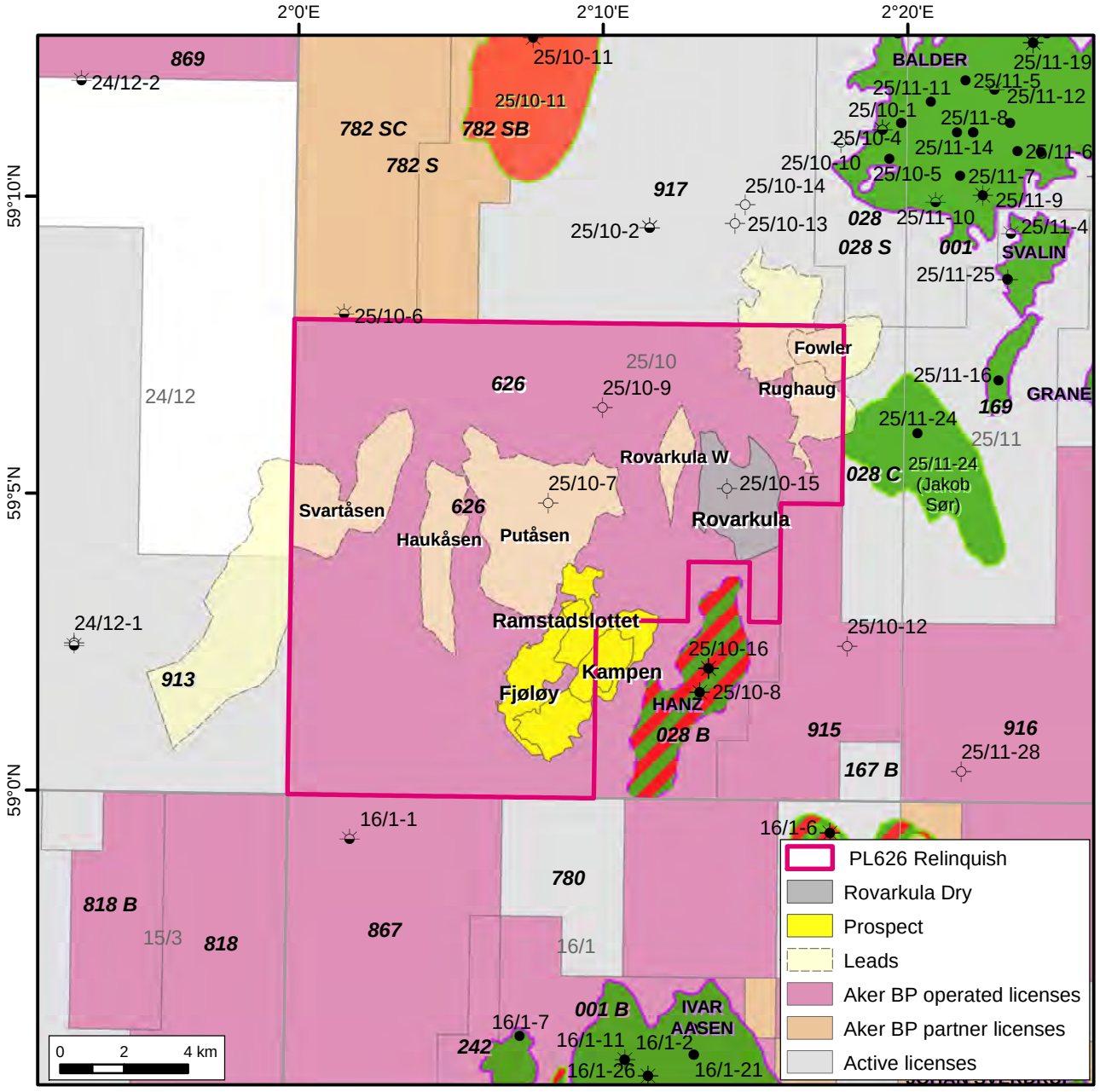


Fig. 1.2 PL 626 map and prospect overview.

The main prospect identified within PL 626 acreage was the Rovarkula Prospect. Rovarkula was tested with well 25/10-15 S and was primarily targeting Intra Draupne Formation sandstones (Fig. 1.3Fig. 1.4). The Rovarkula consists of the nju-3 play with marginal/shallow marine to deep marine sandstone of the Draupne and Heather formations. The Upper Jurassic sandstone play is well established in the area, and proven on the Gudrun Terrace through primarily the Hanz Discovery, 6 km south of the Rovarkula Prospect. The prospect was defined on a 4-way closure on two seismic markers; the BCU and the J80 (Intra Draupne Fm) (Fig. 1.3Fig. 1.5). Through seismic analysis and regional geological evaluation, a chance of encountering hydrocarbon filled reservoir was expected both between BCU and the J80 marker, and below the J80 marker. The sands beneath the BCU were thought to be soft with very low seismic response, similar to the sandstones on Hanz. The J80 reflector was thought to represent the other top sand, as modelled from 2D response. The hydrocarbons were thought to be sourced from the Draupne and Heather formations, which are mature in the kitchen to the west (Vana sub-basin).

Fig. 1.5 shows the target location of the 25/10-15 S well. The well was positioned to be firmly within the 4-way closure at both BCU and J80 level.

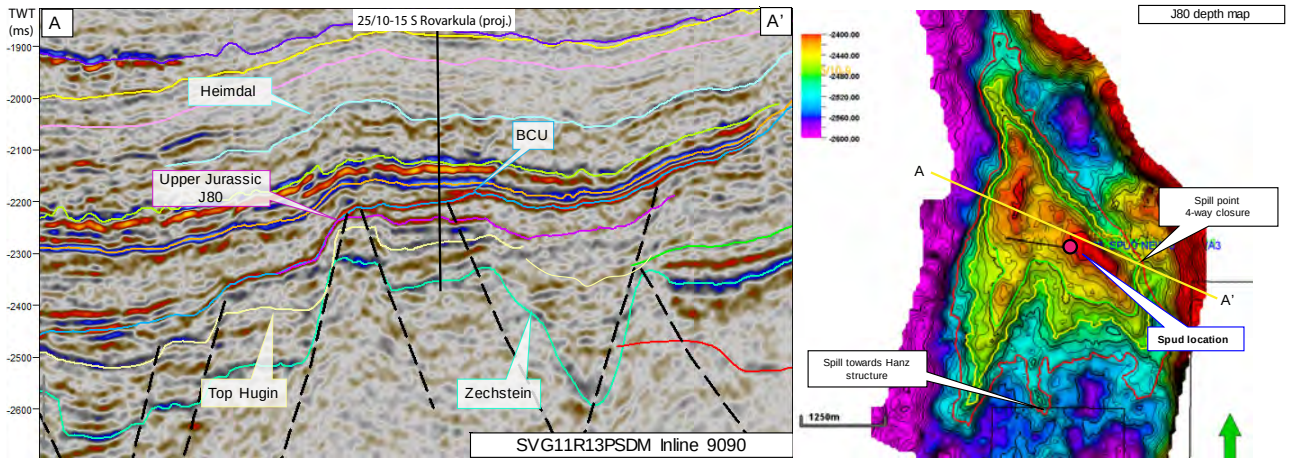


Fig. 1.3 Rovarkula Prospect with defined closure. *Left: Vertical seismic section, right: J80 Depth map with outlined closure, spud and concept*

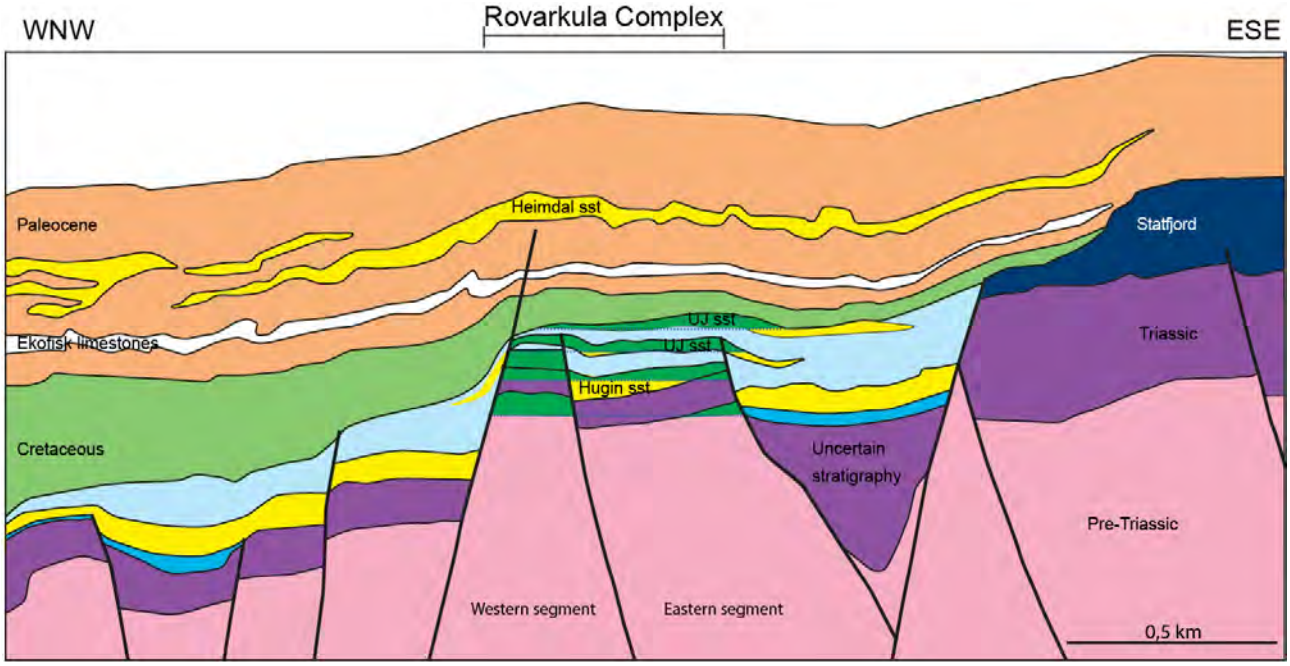


Fig. 1.4 Rovarkula prospect concept - Pre-drill. *Geoseismic section showing the initial concept of the Rovarkula prospect before drilling*

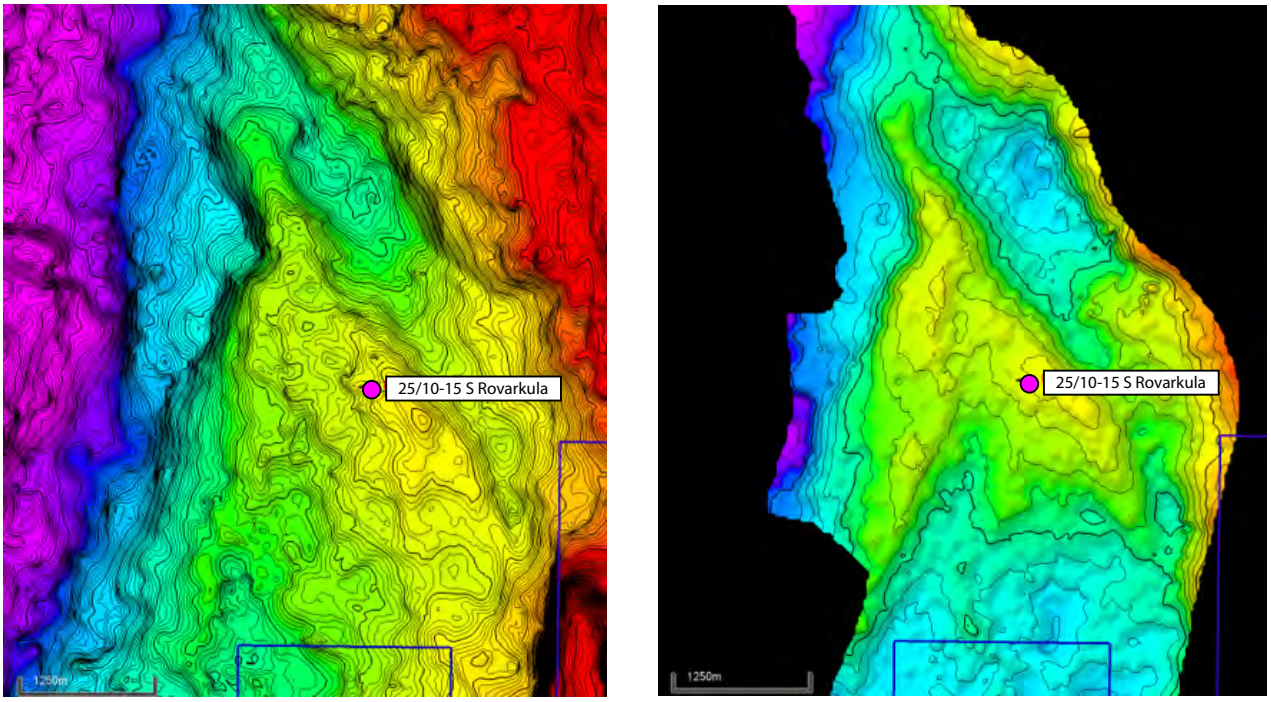


Fig. 1.5 Structural map [depth] of the Rovarkula Prospect. *Left: BCU Depth map, right: J80 Depth map*

The result from 25/10-15 S proved reservoir in the Intra Draupne Formation which was water wet. The Intra Draupne Formation sandstones (J80) reflector came in deeper than the pre-drill prognosis. The J80 sands, thought to be the top of the soft sand, in fact correlated to a base sand reflector. Intra Draupne Formation sandstones were found in the BCU-J80 sequence (Fig. 1.6). The reservoir quality of the Intra Draupne Formation sandstone was good with 19 m net sand, and an average total porosity of 0,24 (Fig. 1.7). The N/G ration with the Draupne Fm is 0,18 (gross thickness of the Draupne Fm is 106 m).

The most likely explanation to 25/10-15 S being dry is the lack of sufficient migration to fill the structure. The well was placed within a 4-way closure, where the Intra Draupne sandstones are directly juxtaposed against Statfjord to the east. Reservoir was present and of good quality, although shallower than expected. As seen in Fig. 1.8, the Rovarkula Prospect may be located in a migration shadow to the kitchen to the west. It is not predicted to receive hydrocarbons from the south through fill-spill of Hanz. The depositional patterns of the Intra Draupne Formation sandstone is not fully understood, although proven at both Rovarkula and the Hanz Discovery. An alternative explanation to the dry well is that fault seal and juxtaposition against the Statfjord Formation may have caused any migrated hydrocarbons to leak out. The Intra Draupne Fm sandstones have a 3 bar drawdown from the water gradient, interpreted to be regional depletion due to production from Balder/Grande fields. This observation supports the lack of fault seal between Rovarkula and the stratigraphy immidiately to the east, and would further strengthen that trap/seal was not present at Rovarkula.

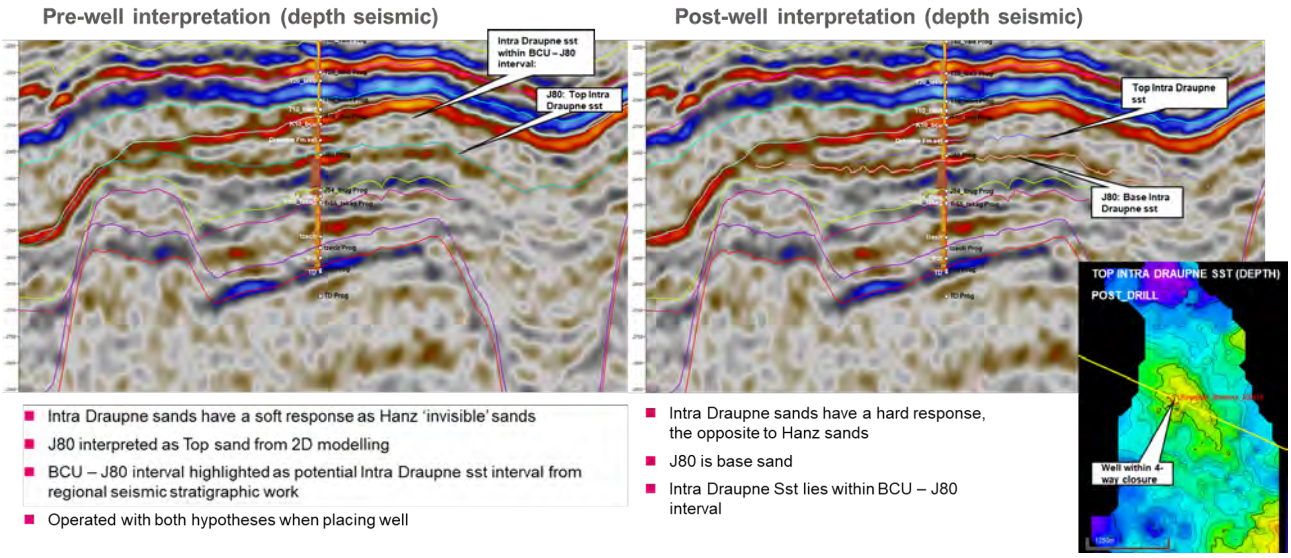


Fig. 1.6 Rovarkula pre and post drill interpretation. *Explaining and showing differences in interpretation pre and post drill of the 25/10-15 S well.*

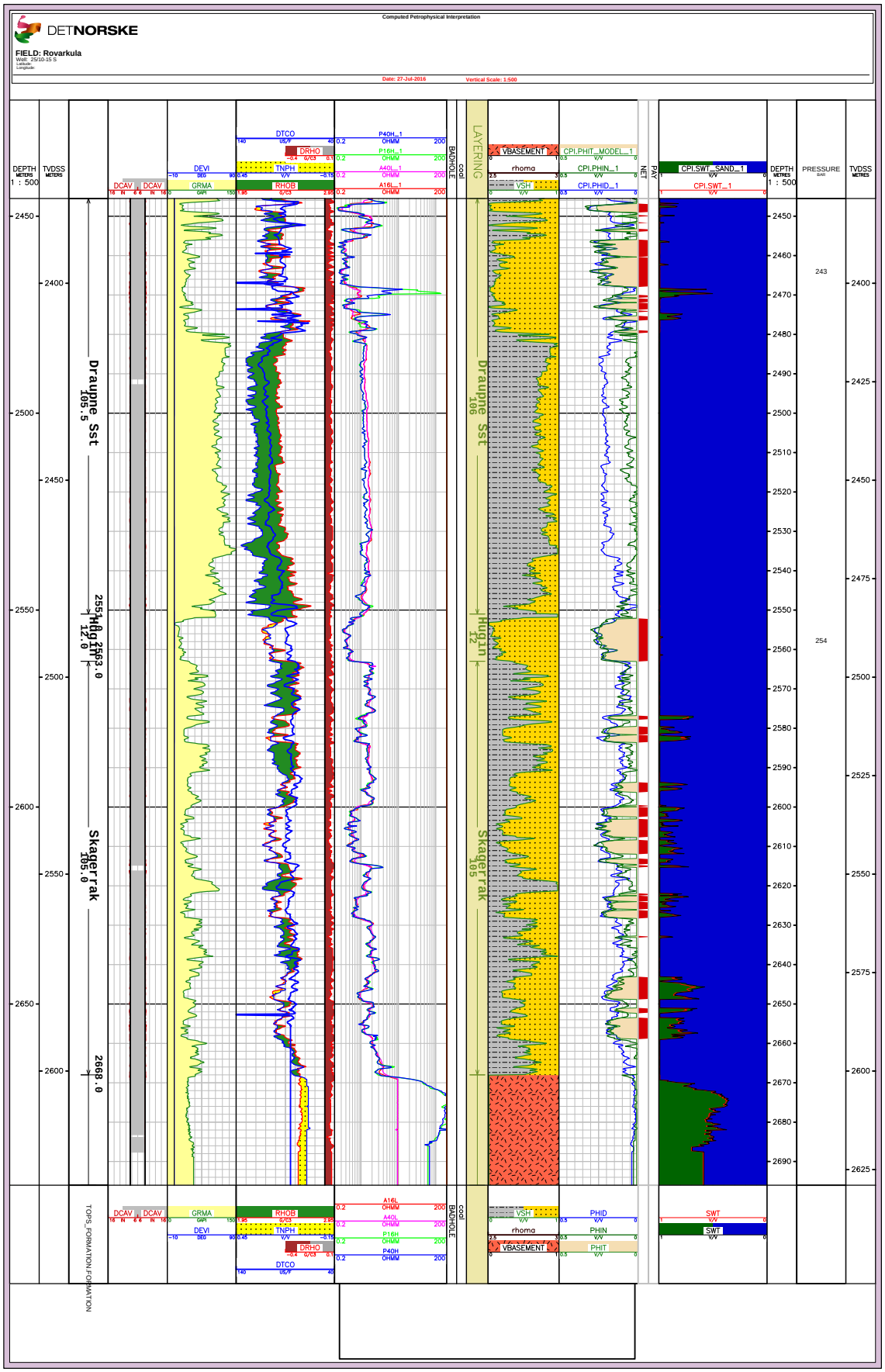


Fig. 1.7 25/10-15 S CPI over the Jurassic-Triassic interval.

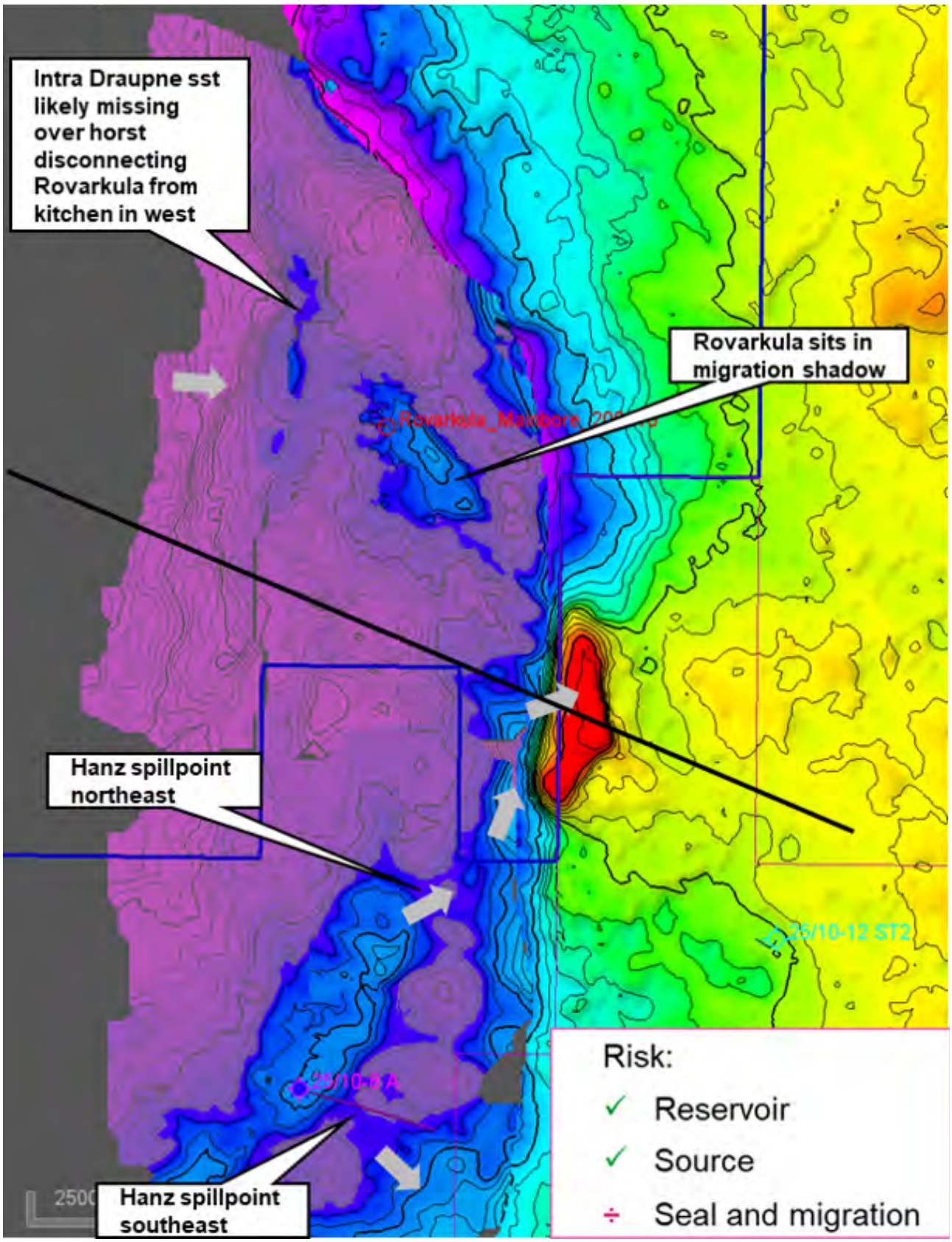


Fig. 1.8 Dry hole analysis - most likely theory. *Map explaining the likely failure mechanism(s) in well 25/10-15 S: Fault seal and/or migration*

2 Database

2.1 Seismic database

The initial interpretation in the license was based on the 3D seismic cube MC3DSVG11 from PGS. As a part of the license obligations, the 3D seismic was reprocessed, resulting in a 615 km^2 PSDM cube covering the license, prospectivity and additional areas to the east, south, west and north (Fig. 2.1). The reprocessing was done to increase seismic resolution, improve disturbed imaging beneath shallow channels in the area and optimize the seismic for angle versus offset analysis.

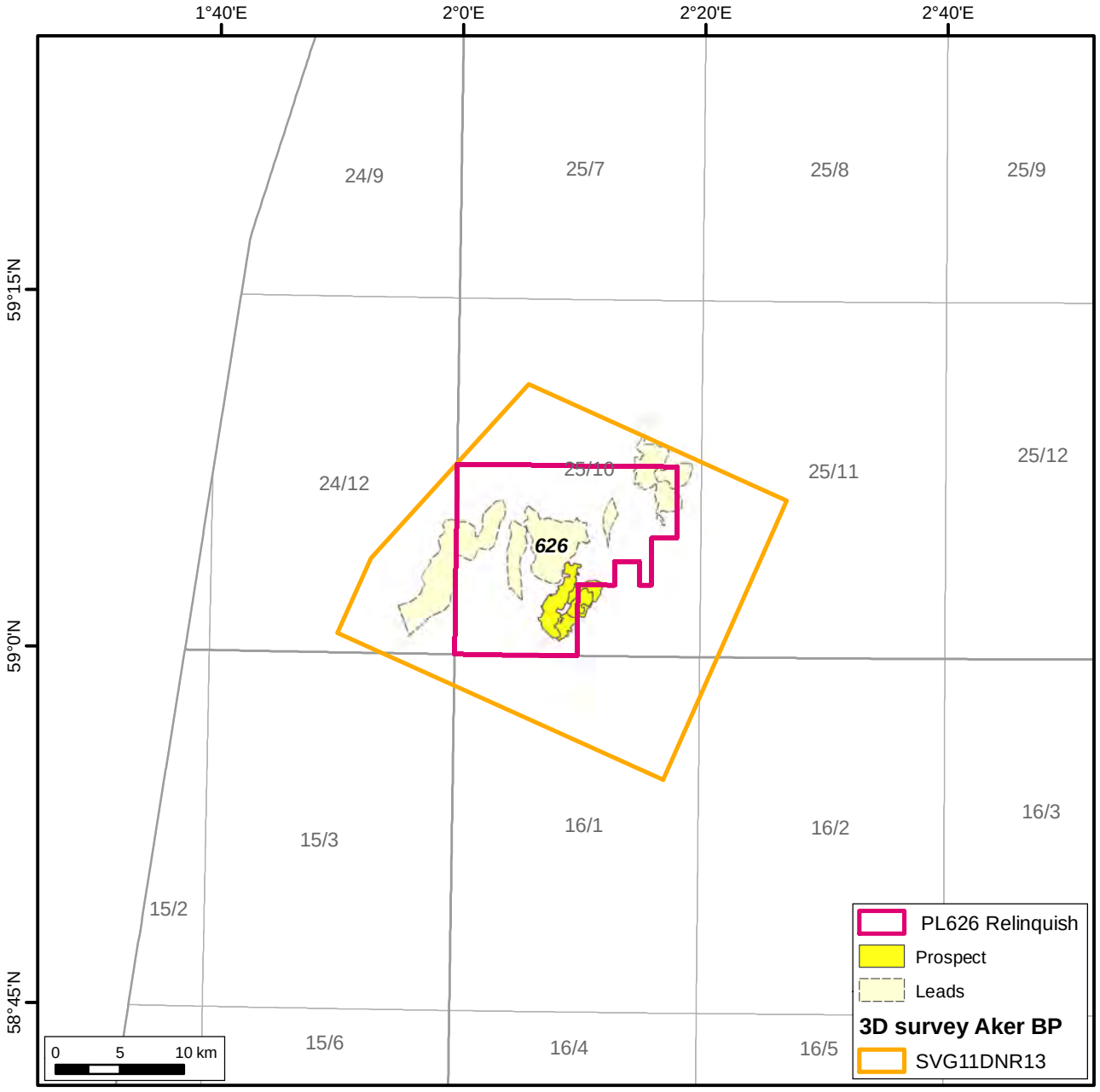


Fig. 2.1 PL 626 Common Seismic database. *The map shows the outline of the common seismic database SVG11DNR13. Base seismic for the reprocessing is MC3DSVG11*

Name	Child surveys	Wells covered	Area (sqkm)	Company
SVG11DNR13	MC3D-SVG11	16/1-1, 16/1-2, 16/1-6, 24/12-1, 25/10-2, 25/10-6, 25/10-7, 25/10-8, 25/10-9, 25/10-12, 25/11-16, 25/11-24	615.25	PGS/Det norske

Fig. 2.2 Reprocessing survey details.

2.2 Well database

The wells defined in the common database are shown in Fig. 2.3 and Fig. 2.4.

Well	Status	Year	TD (MD) (m)	TD formation
16/1-1	Oil shows	1967	3203	Late Cretaceous
16/1-11	Oil	2010	2532	Triassic
16/1-14	Oil	2010	2550	Triassic
16/1-2	Oil	1976	2919	Basement
16/1-3	Oil shows	1982	3498	Basement
16/1-4	Oil shows	1983	2010	Basement
16/1-5	Oil shows	1998	2460	Basement
16/1-6A	Dry	2005	2194	Late Cretaceous
16/1-6S	Oil & Gas	2003	1997	Late Cretaceous
16/1-7	Oil	2004	3186	Late Triassic
16/1-8	Oil	2007	2200	Triassic
16/1-9	Oil	2004	3186	Late Triassic
16/2-1	Oil shows	1967	1906	Basement
16/2-2	Dry	2001	1880	Early Cretaceous
16/2-3	Oil	2007	1905	Basement
16/2-4	Oil	2007	2000	Basement
16/2-5	Oil	2009	2373	Basement
16/2-6	Oil	2010	2158	Late Permian
16/2-7	Oil	2011	2140	Late Triassic
24/12-1R	Oil shows	1978	4825	Triassic
24/12-3S	Oil	1996	3058	Våle Formation
24/12-4	Dry	2001	2265	Heimdal Formation
24/12-5S	Dry	2007	2325	Heimdal Formation
24/12-6S	Dry	2010	5207	Middle Jurassic
24/9-1	Oil shows	1976	4907	Upper Jurassic
24/9-2	Dry	1977	2743	Upper Cretaceous
25/10-1	Oil shows	1970	2092	Early Jurassic
25/10-10	Oil shows	2010	2513	Zechstein
25/10-11	Gas/Cond	2011	4562	Jurassic
25/10-2R	Oil shows	1972	3181	Basement
25/10-4R	Oil shows	1981	2550	Rotliegendes
25/10-6S	Oil shows	1996	4706	Sleipner Formation
25/10-7S	Oil shows	1996	2617	Ekofisk Formation
25/10-8	HANZ Discovery	1997	2653	Early Permian
25/10-9	Dry	2009	2985	Jurassic
25/11-23	Gas/Cond	1999	2014	Early Jurassic
25/11-24	Gas/Cond	2007	2117	Early Jurassic
25/7-1	Dry	1986	3592	Pre-Devonian
25/7-2	Gas/Cond	1990	4847	Sleipner Formation
25/7-3	JOTUN Field	1995	2540	Tor Formation
25/7-4	Dry	1997	2560	Tor Formation
25/8-1	BALDER Field	1970	2606	Permian
25/8-13	Dry	2001	2276	Early Jurassic
25/8-2	Dry	1975	2578	Triassic

Fig. 2.3 Common Well database table.

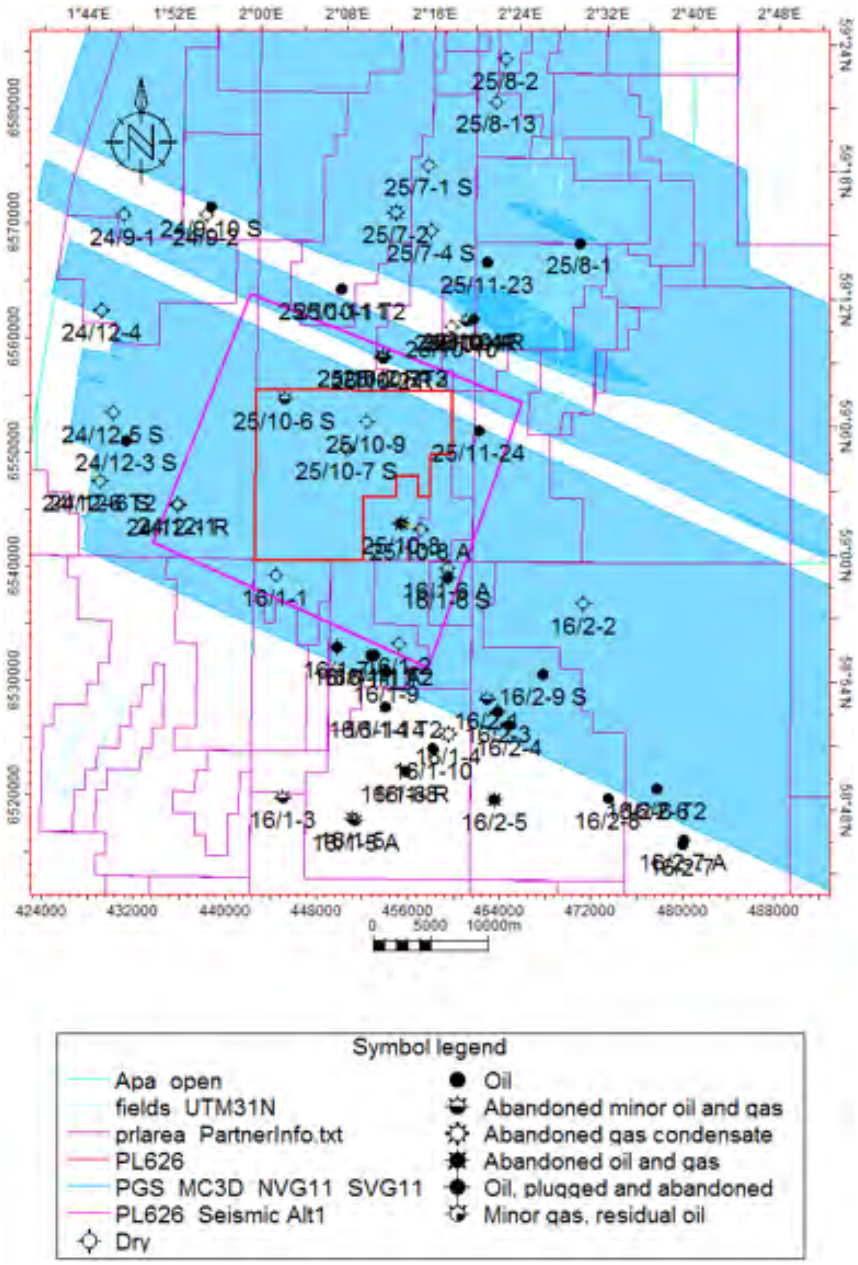


Fig. 2.4 Common Well database map.

2.3 Special studies

Seismic conditioning and analysis

Extensive geophysical work has been carried out on the entire dataset. This includes de-noising, spectral balancing and variable time adjustment of every angle stack to optimize for further AVO work. Coloured inversion for every stack and EEI cubes (Intercept vs Gradient rotations) resulting in lithology and fluid cubes are also produced.

3 Remaining prospectivity

3.1 Ramstadslottet

The Ramstadslottet Prospect consists of a mounded pinchout of sands within the uppermost Heimdal Formation deep marine sandstones, informally defined as the T650 sequence on seismic (Fig. 3.1). It consists of a small 4-way closure, and a larger closure that requires lateral seal at the pinchout to the east/north. They key risk of the prospect is migration and seal, with two nearby wells penetrating the interval on apparant closures (25/10-15 S and 25/10-8). The sand is mappable on seismic, but gives no DHI anomaly that can derisk the prospect. Ramstadslottet has a chance of success of 0,14, and mean recoverable volumes of 8,8 x 10^6 m^3 oil

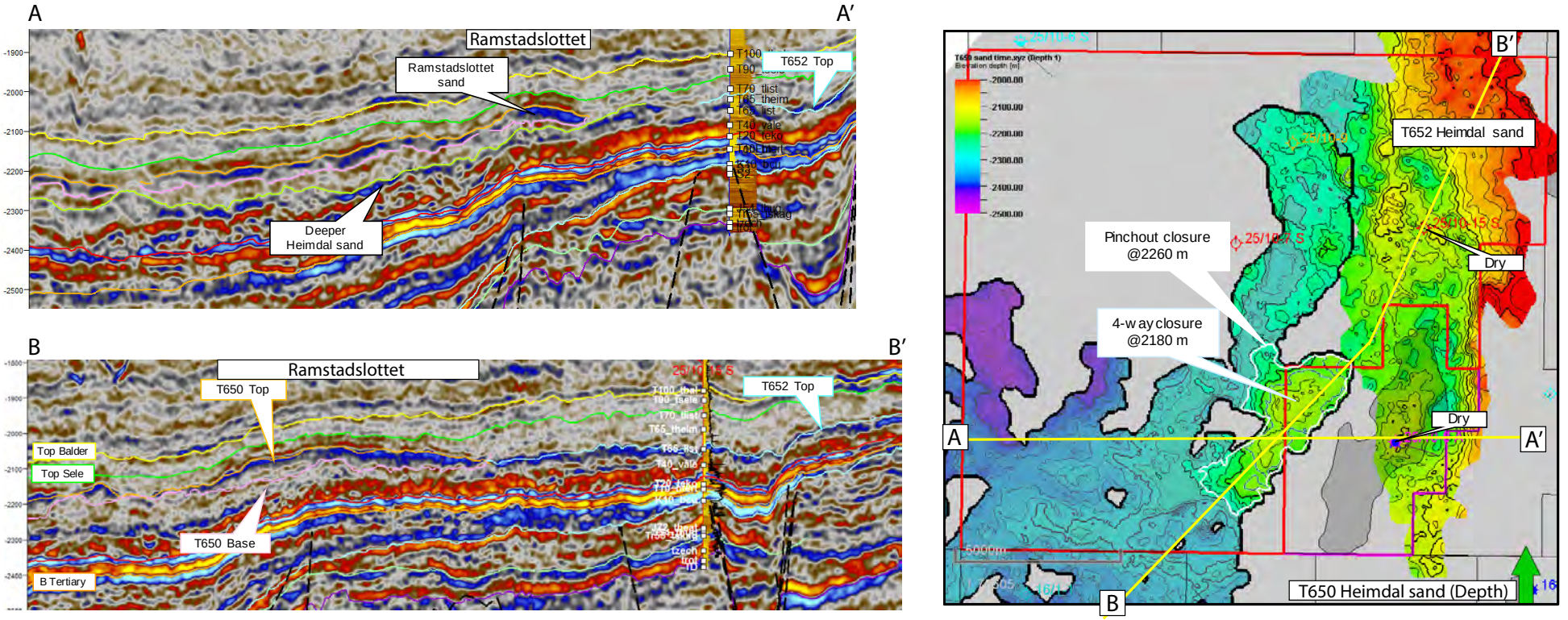
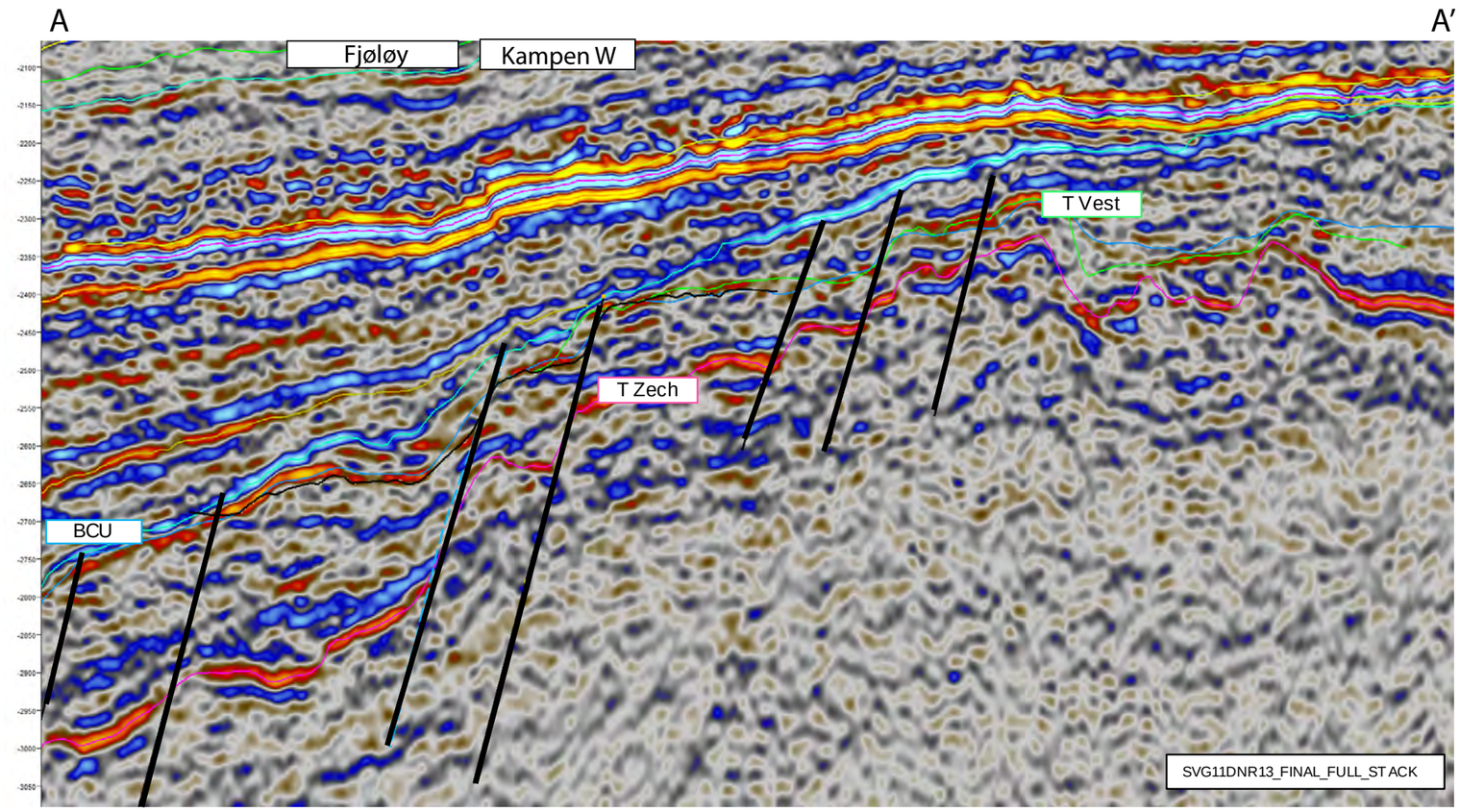


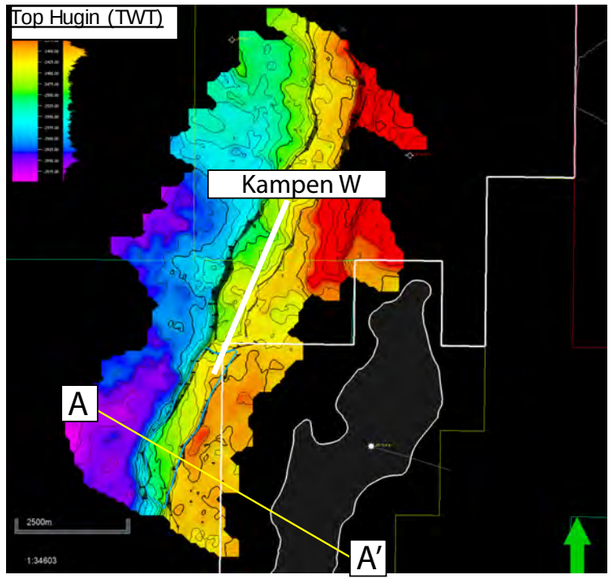
Fig. 3.1 Ramstadslottet Prospect. *Top left: West-East seismic line through the prospect. Bottom left: South-North seismic line through the prospect. Right: Structural depth map of the T650 reflector (Heimdal Fm sand).*

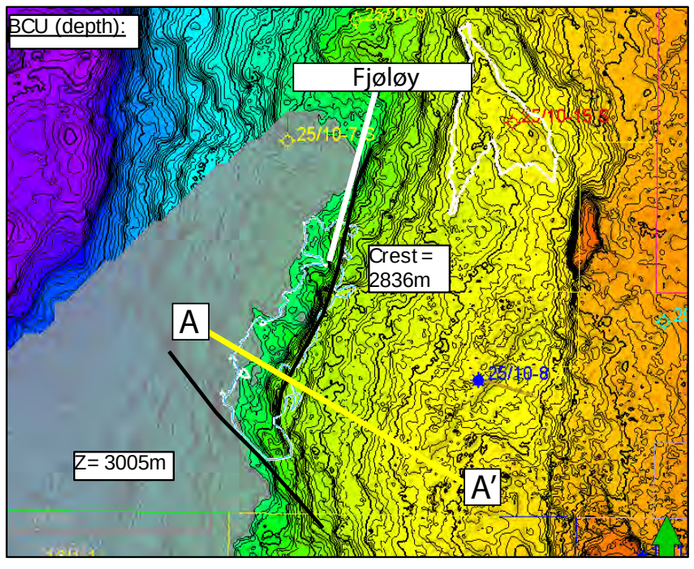
3.2 Fjøløy and Kampen W

The Fjøløy Prospect is defined in a downfaulted block from the Hanz terrace. It has an elongated defintion and conforms to a NE-SW oriented fault block. The concept is primarily defined within the Upper Jurassic wedge between the BCU and Top Vestland (T Vest) reflector. The seismic quality is poor, and hence reservoir definition is uncertain. The main risk to Fjøløy is the trap and seal risk associated with fault sealing against up dip reservoir (Triassic and Middle Jurassic) on the footwall. The prospect is also dependent on pinch-out to the north and fault seal/pinch-out to the south. Fjøløy has a chance of success of 0,10, and mean total recoverable volumes of 7,8 x 10^6 m^3 .

Kampen W is the updip fault block from the Fjøløy Prospect. The prospect is defined as a downfaulted block from the Hanz terrace. The concept is primarily defined within the Middle Jurassic Hugin formation, in an isolated fault segment (remnant relay ramp). It is reliant on fault seal/pinch-out to the north and east, and key risk is seal against juxtaposed Middle Jurassic and Triassic. Kampen W has a chance of success of 0,16, and mean total recoverable volumes of 4,2 x 10^6 m^3 .







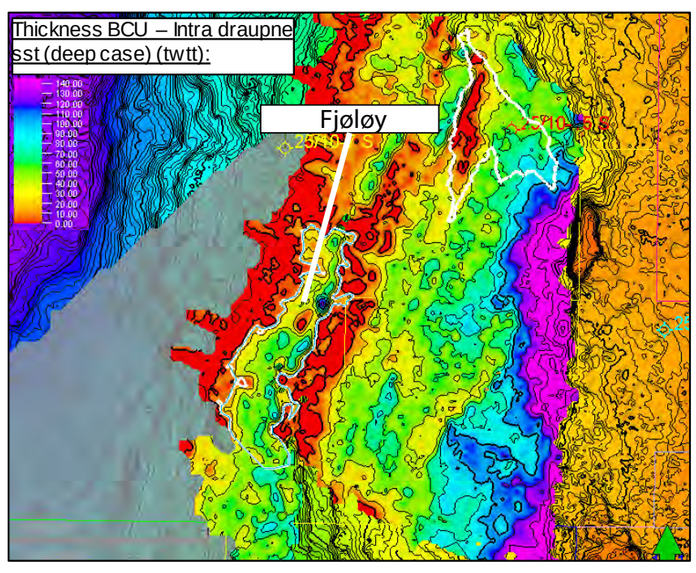


Fig. 3.2 Fjøløy Prospect. *Top: Seismic section. Bottom left: Top Hugin time structural map. Bottom middle: BCU depth structural map. Bottom right: TWT thickness between BCU and Intra Draupne Fm sst*

3.3 Kampen

The Kampen Prospect is defined in a partly downfaulted block from the Hanz terrace with a small 4-way closure. The concept is primarily defined on the Top Hugin Formation level. The main risk to Kampen is the trap and seal risk associated with fault sealing/pinch-out to the south and east to give a larger closure. Kampen has a chance of success of 0,22, and mean recoverable volumes of 1,0 x 10^6 m^3 oil

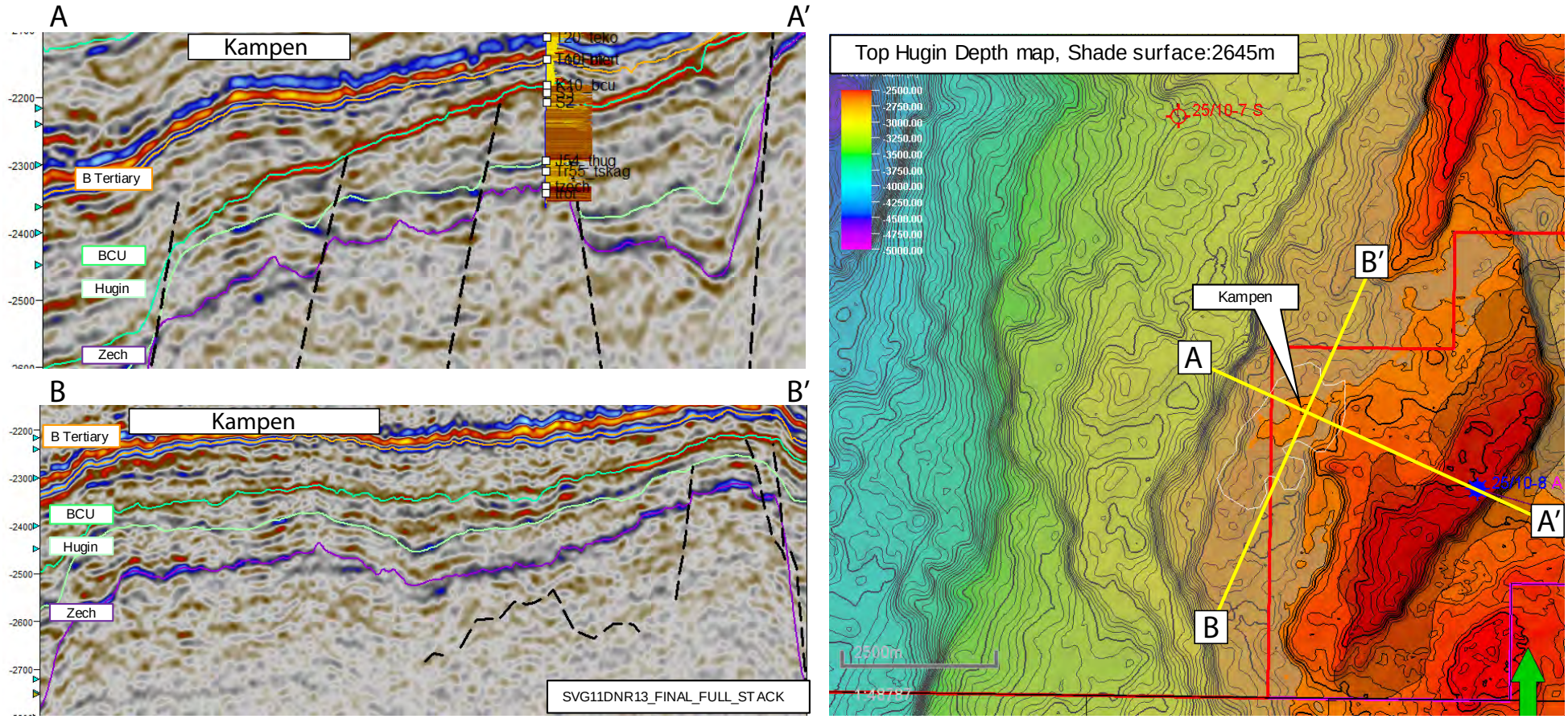


Fig. 3.3 Kampen prospect *Top left: W-E seismic section. Bottom left: S-N seismic section. Right: Top Hugin depth structural map.*

Table 3.1 Prospect summary PL 626

Summary				Recoverable Resources (*10^6 Sm3)					
				P90		**Base (mean)**		**P10**	
Prospect	**Reservoir**	**HC**	**POS%**	**Oil**	**Gas**	**Oil**	**Gas**	**Oil**	**Gas**
Ramstadslottet	Heimdal Fm	Oil	14	4.5	0.3	8.8	0.6	13.3	0.9
Fjøløy	Intra Draupne Fm	Oil	10	2.5	N/A	7.8	N/A	14.7	N/A
Kampen W	Hugin Fm	Oil	16	3.2	N/A	4.2	N/A	5.2	N/A
Kampen	Hugin Fm	Oil	22	0.7	0.2	1.0	0.3	1.4	0.3

4 Conclusion

The PL 626 has 4 remaining prospects and several leads. The work programme for PL 626 has been fulfilled, and one exploration well (25/10-15 S Rovarkula) has been drilled and proven dry. After a full evaluation and incorporation of the well results into the risking of the remaining prospectivity, the license group recommends to drop the license. The PL 626 Management Committee has therefore allowed the license to expire past the BoK deadline of 03.02.2019.

5 References

www.akerbp.com