WELLESLEY
PETROLEUM

Title:

Status report surrender

PL881

Revision	*Date*	*Prepared by:*	*Approved by:*
00	06.01.20	[redacted]	

WELLESLEY PETROLEUM

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1 History of the production license

PL881 was awarded February 10 2017 in the APA 2016 licensing round. Wellesley Petroleum AS is the license operator (70%) and DNO, previously Faroe Petroleum Norge AS, is the license partner (30%). The license covers 84.447 km² within block 33/9 which covers the Tampen Spur on the north-western margin of the North Viking Graben. The license area with prospects and well 33/9-22 S is shown in Fig. 1.1.

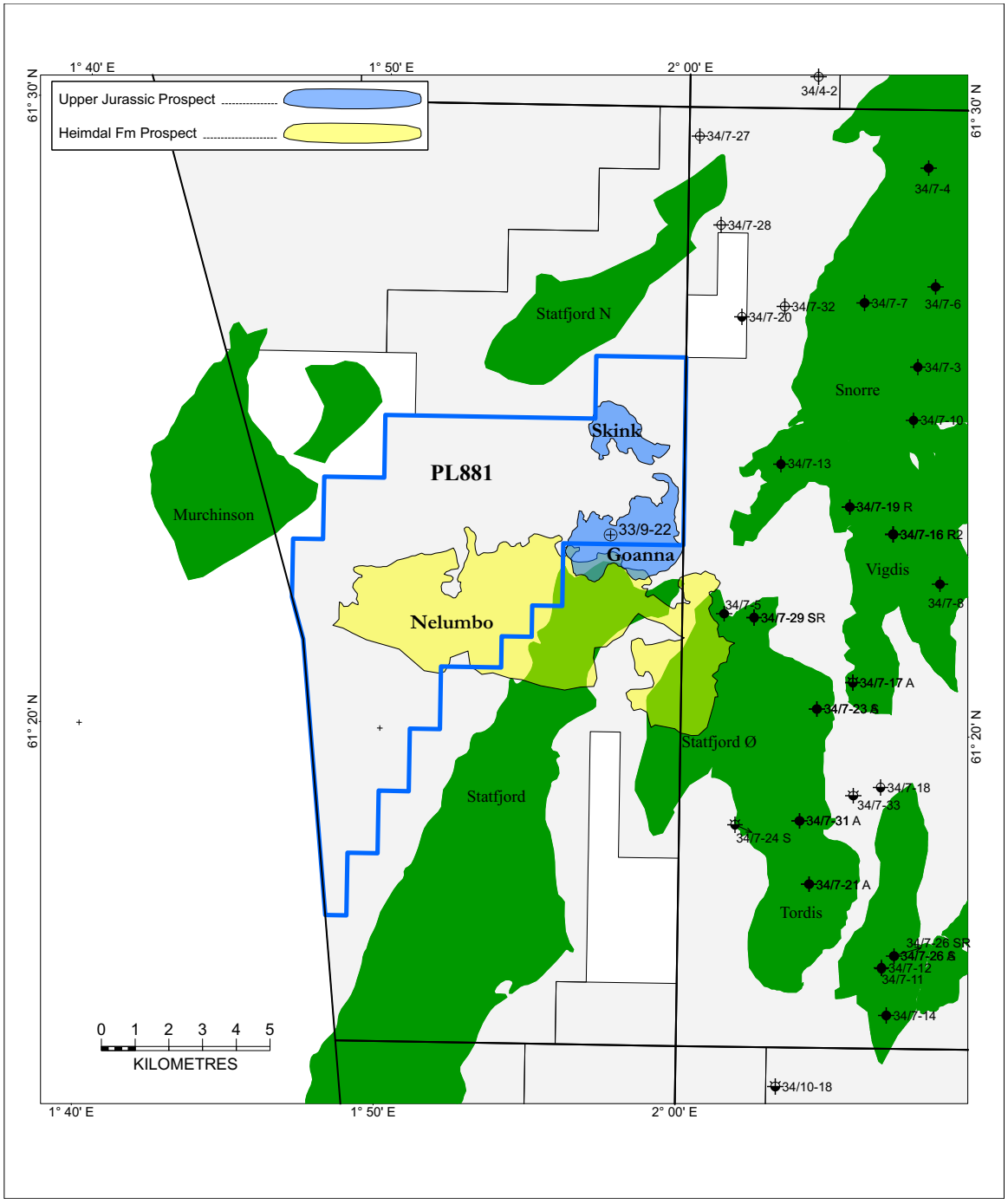

Fig. 1.1 Identified prospects applied for in APA 2016

The PL881 work commitment was to purchase and access at least 150 km² of 'BroadSeis™ – BroadSource™' 3D seismic seismic data shot by CGG in 2016. This survey was expected to significantly improve the imaging of both the Upper Jurassic and Paleocene targets and enable a drill decision within 1 year.

Wellesley Petroleum has, on behalf of the license group, fulfilled the work commitment and have drilled the exploration well 33/9-22 S. The license decision gates for PL881 are presented in Table 1.1.

Table 1.1 PL881: License decision gates

Work obligation	Decision	Task status	Expiry date
Acquire 3D Seismic		Completed	10.02.2018
	Decision to drill	Completed	10.02.2018
	(BoK) Decision to concretize	Completed	10.02.2020
Conceptual studies			
	(BoV) Decision to continue	Completed	10.02.2021
(PDO) Prepare plan for development			
	(PDO) Submit plan for development	N/A	10.02.2022
	Decision to enter extension period	N/A	10.02.2024

License meetings

EC/MC meeting 1: 09.03.2017

EC/MC meeting 2: 27.11.2017

EC/MC meeting 3: 30.10.2018

EC/MC meeting 4: 24.10.2019

EC meetings/Work meetings

Method Selection Meeting: 20.04.2017

Drill or drop recommendation: 25.04.17

Faroe Partner Audit: 07.08.2017

DWOP/HAZOP: 17.08.2017

EC Work meeting: 20.09.2018

Reason for relinquishment

The Goanna prospect was matured as a drilling candidate by the license group and a decision to drill was made 25.04.2017. Drilling of well 33/9-22 S commenced on 26.08.2017 and the well operation was completed on 10.09.2017. The primary target was Upper Jurassic (Tithonian) Munin Formation sandstone in a stratigraphic trap on the northern flank of the Statfjord Field in Block 33/9. The secondary target was the potential for hydrocarbon bearing sands in Heimdal Formation. The Heimdal and Munin fm sandstones were both found to be dry, and no shows were reported in either of the formations. Following drilling of well 33/9-22 S, the focus turned to the Nelumbo prospect. The Nelumbo Prospect is an extension of a proven minor oil accumulation reservoired in Heimdal Formation sandstones in PL037 (33/9-G-3H and 33/9-G-4H) that postulated to extend

into PL881. Further work did not support a larger accumulation and deeper contact for the Nelumbo prospect, and the overall risk was considered too high to further explore the prospect. An alternative model, the Freddy Prospect, suggests an independent closure in the western part of the Nelumbo prospect within PL881. However, this prospect is considered unattractive for further exploration.

2 Database overviews

2.1 Seismic data

Seismic database

The geophysical evaluation of the area was based upon an overlapping patchwork of several vintages of full stack 3D seismic data of variable quality; see Table 2.1. The seismic database used when working on the APA is shown in Fig. 2.1. As part of the work program, the license group decided to include a portion of the CGG17M01 3D broadband seismic data (Fig. 2.2) in the common seismic database. The operator had access to and utilized a regional cube of this same survey. As part of the planning for the Goanna well, a 2D site survey WP17300 was acquired.

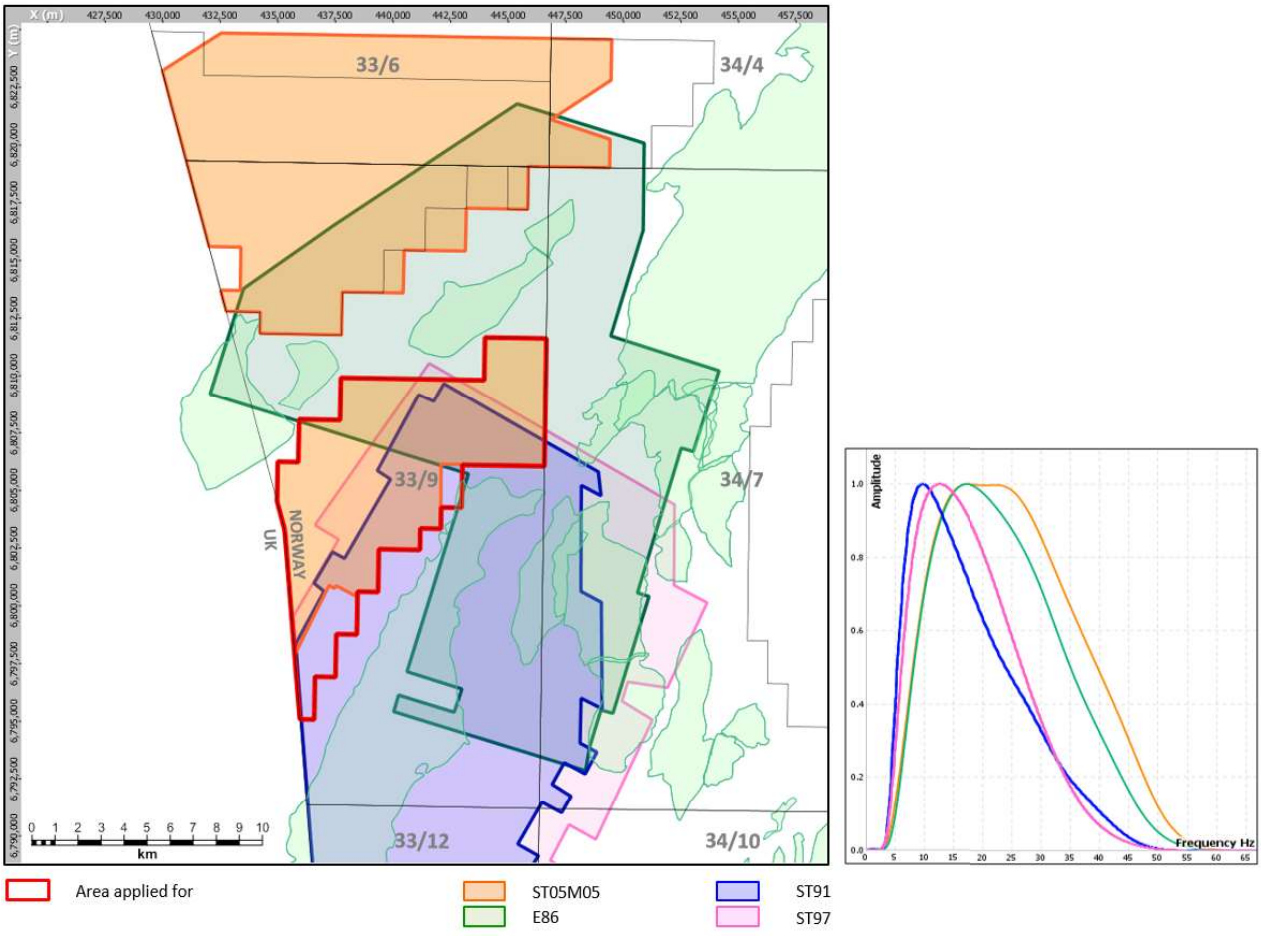

Fig. 2.1 3D Seismic database APA 2016
Inset shows the normalized frequency content for each survey. CGG BroadSeis Broadsource not included in map.

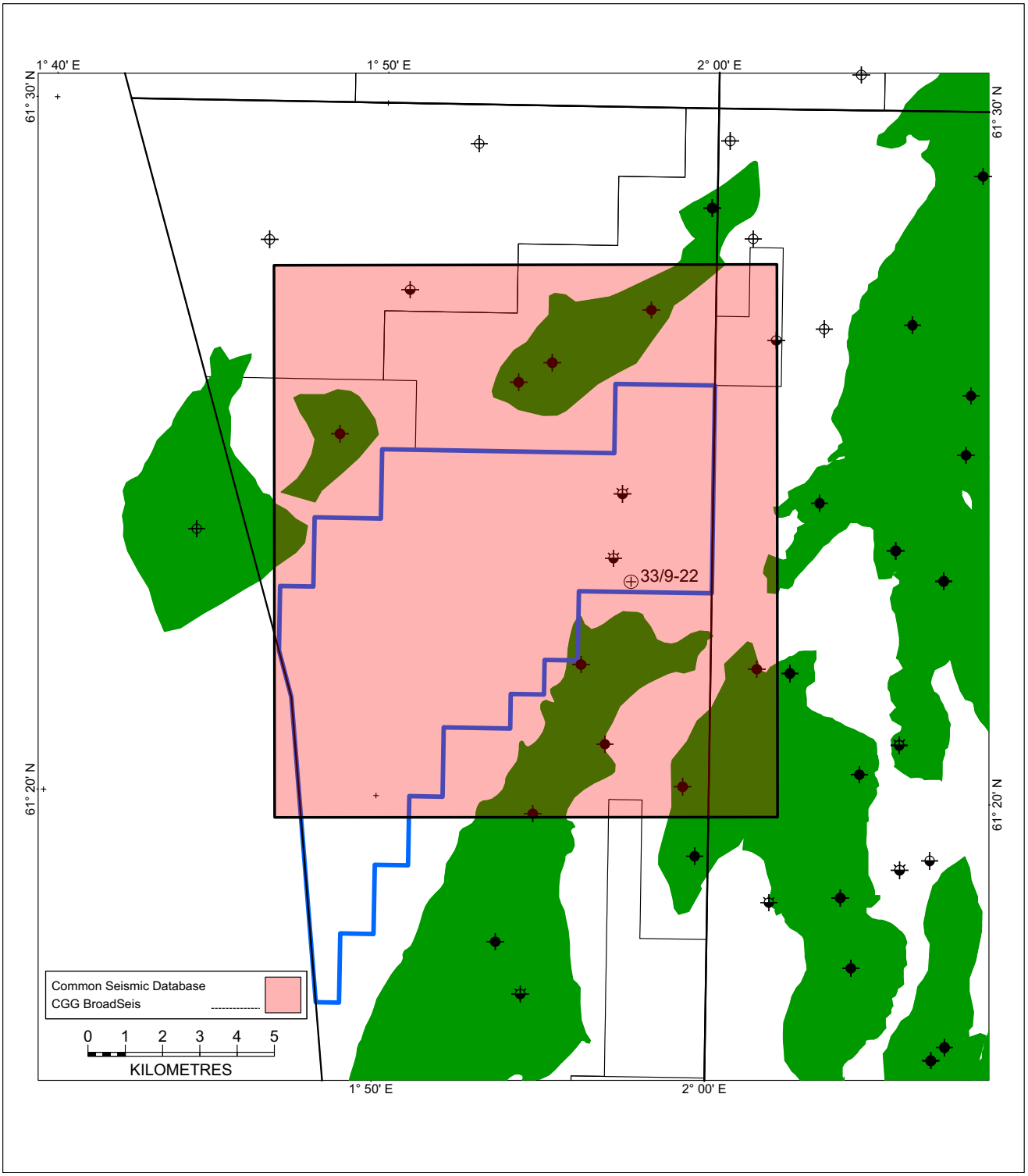

Fig. 2.2 PL881 Common Seismic Database
CGG17M01 3D BroadSeis

Table 2.1 3D Seismic database

Survey	Status	Area km²	Version	Quality
ST05M05	Released	245	Full stack	Good
E86	Released	329	Full stack	Good
ST9101	Released	281	Full stack	Moderate
ST9703	Released	352	Full stack	Good
CGG17M01 BroadSeis	Acquired	350	Full stack, Partial stacks, Gathers	Good

2.2 Well data

The well database used in the APA 2016 and subsequent license work is presented in Table 2.2; a map of the wells is shown in Fig. 2.3.

Table 2.2 Well Database

Well - NO						Wells - UK		
Well name	Completion	Status	Petrophysics	Depth Conversion	Well tie	Well name	Completion	Status
33/9-1	1974	Released		X		211/19-2	1975	Released
33/9-2	1974	Released				211/19-3	1975	Released
33/9-3	1974	Released		X	X	211/19-4	1976	Released
33/9-4	1975	Released	X			211/19-5	1976	Released
33/9-5	1976	Released	X	X	X	211/19-6	1977	Released
33/9-6	1976	Released		X		211/19a-9	1998	Released
33/9-7	1976	Released	X	X		211/24c-7	1993	Released
33/9-8	1977	Released	X	X	X			
33/9-9	1977	Released		X				
33/9-10	1978	Released	X	X				
33/9-11	1978	Released		X				
33/9-12	1987	Released		X				
33/9-13 S	1987	Released		X				
33/9-14	1988	Released	X	X	X			
33/9-15	1992	Released	X	X	X			
33/9-16	1993	Released	X	X	X			
33/9-17	1994	Released	X	X	X			
33/9-18	1994	Released						
33/9-18 A	1995	Released						
33/9-19 A	1996	Released						
33/9-19 S	1996	Released		X				
33/9-20 S	2006	Released	X					
33/9-21 A	2009	Released						
33/9-21 B	2009	Released						
33/9-21 S	2009	Released						
33/9-G-3 H	1999	Released	X					
33/9-G-4 H	1999	Released	X					
33/9-G-4 AH	1999	Released	X					
34/7-5	1985	Released	X	X				
34/7-18	1991	Released	X					
34/7-13	1988	Released		X				
34/7-20	1992	Released		X				
34/7-21	1992	Released		X				
34/7-23 S	1994	Released	X					
34/7-24 S	1995	Released						
34/7-26 S	1997	Released						
34/7-27	1998	Released						
34/7-28	1998	Released						
34/7-29 S	1998	Released						
34/7-32	2001	Released						

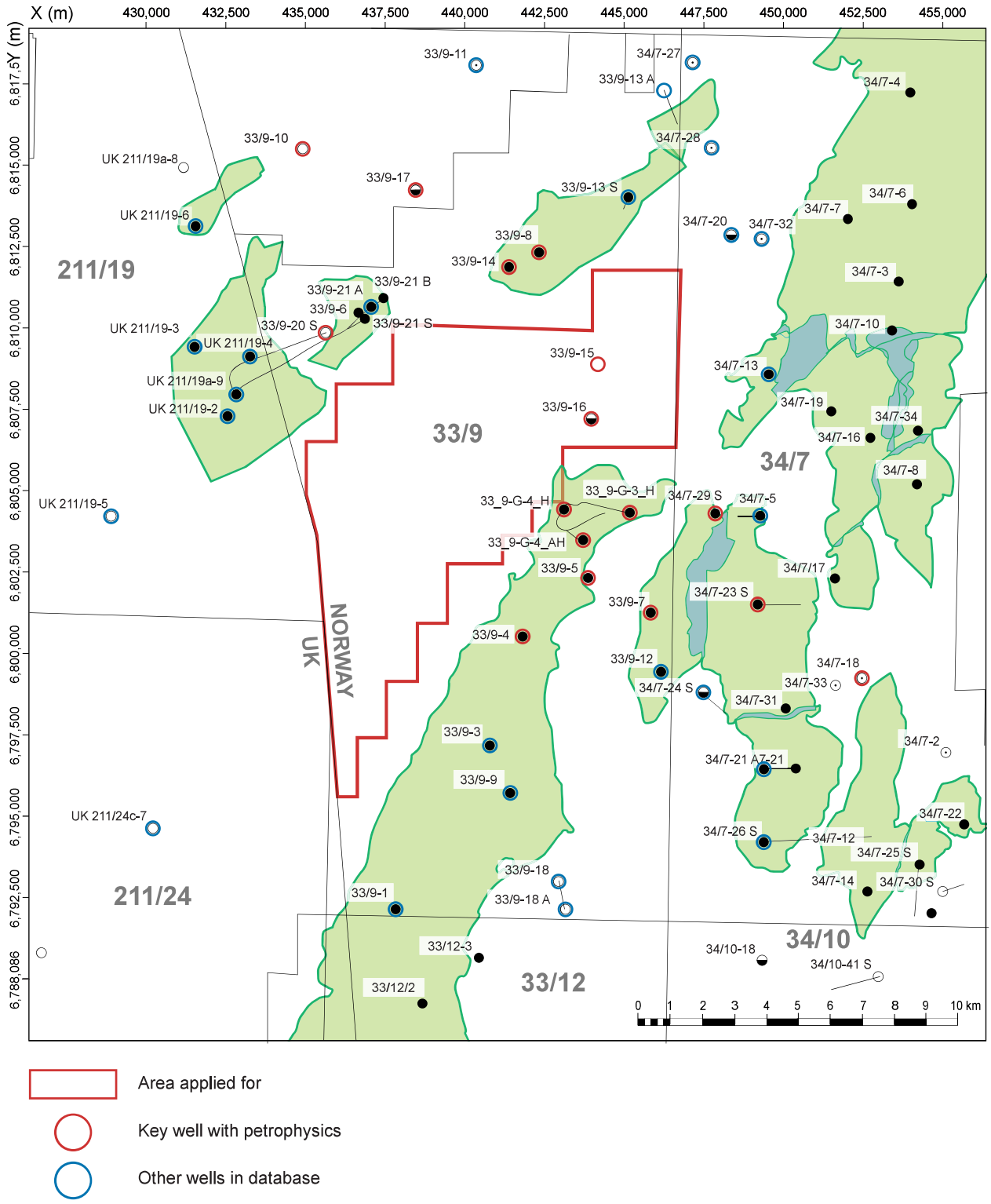

Fig. 2.3 Well Database

3 Results from geological and geophysical studies

Several studies and evaluations have been carried out in-house and by external companies to address the geological and geophysical understanding of the license prospectivity. An overview is given below.

Basin Modelling Study

A basin model using ZetaWare Trinity software was constructed for the region by Torena AS (Throndsen, 2016). This study incorporated the latest seismic mapping and a thorough re-evaluation of the thermal and geochemical data available to determine the maturity and hydrocarbon yield for the potential source rocks. The model was calibrated against drill-stem test (DST) temperatures and vitrinite reflectance data. The source rock properties were interpreted (reconstructed to immaturity) from the average properties of the released wells in the area. The heat flow was allowed to vary laterally, but was kept constant through time and produced a good fit between the calculated and observed values both for temperature and vitrinite reflectance. The modelled present day Draupne Fm source rock maturity is shown in Fig. 3.1.

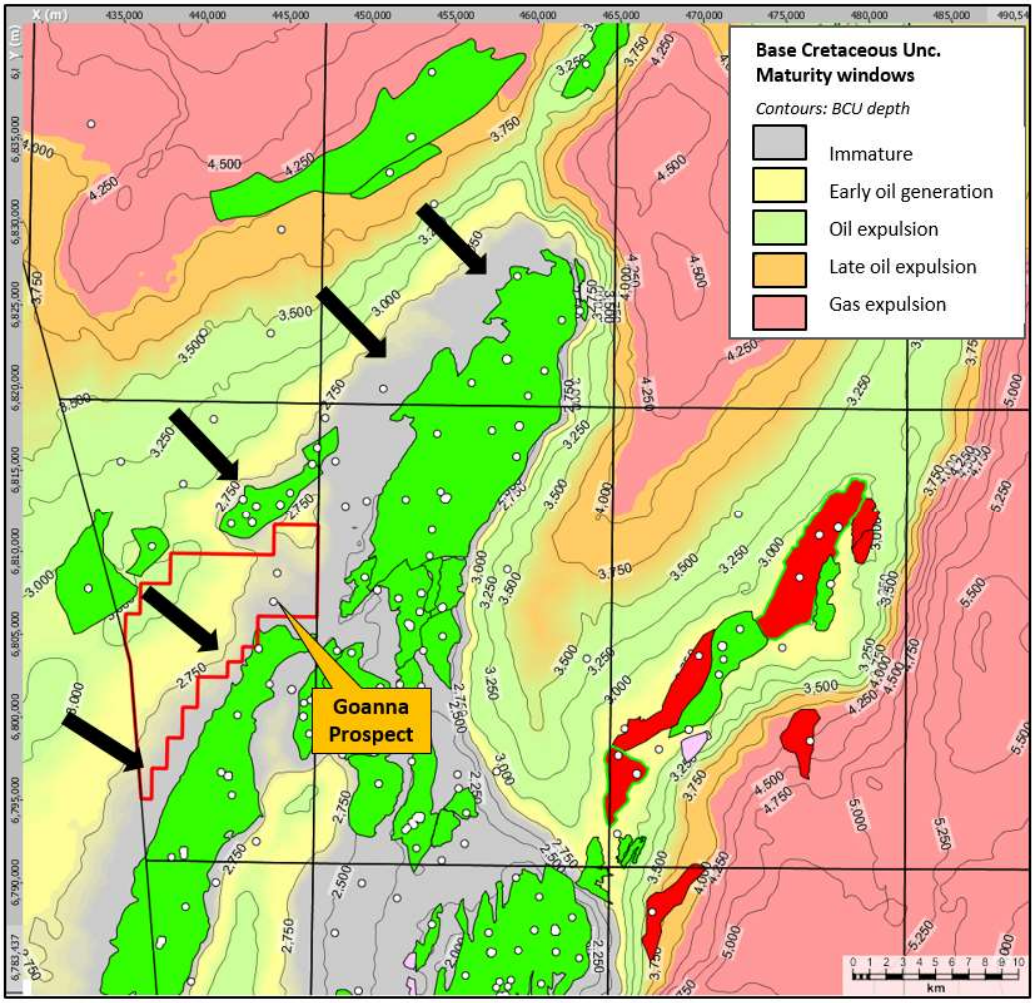

Fig. 3.1 Hydrocarbon charge model for the Tampen Spur
From Throndsen, 2016.

Petrophysics Study

A detailed petrophysical analysis of the Upper Jurassic and/or Palaeocene reservoirs in sixteen key wells was completed for the APA application (2.2 Well data).

Rock Physics Study

A detailed in-house rock physics study was performed for both Upper Jurassic and Paleocene sandstones prior to receiving the CGG17M01 BroadSeis 3D seismic data. This study was a key part of the license work program, and indicated a potential for direct detection of hydrocarbons on seismic gathers. Seismic gathers of the CGG17NM01 survey were conditioned in-house with noise and multiple suppression, gather alignment and spectral balancing. The conditioned CGG gathers did, however, not demonstrate the modelled AVO class IV response for an oil vs brine fluid in Upper Jurassic sands, neither over the Goanna prospect or the Statfjord North accumulation. It is believed that the variation in overburden and reservoir sections mask the seismic fluid effect.

Post-well Studies

Multiple studies were conducted following the drilling of the Goanna well, 33/9-22 S, as part of the post-well analysis. These included biostratigraphy (RPS Ichron) to incorporate the new well in an updated biostratigraphic framework, geochemistry (APT) to assess the maturity and source potential of the Draupne Fm, and SpecCam (Infra-red Spectroscopy) to assess the quality and clay composition of encountered Paleocene and Jurassic reservoirs.

Regional SpecCam and XRF study

A study was undertaken to investigate the regional clay mineral composition of the Heimdal Fm to assess the variation in sandstone quality and permeability for the Nelumbo Prospect. Cuttings from the Paleocene section were obtained from 9 wells, including the Goanna well (33/9-22 S). SpecCam (Infra-red Spectroscopy; Fig. 3.2) and XRF (x ray diffraction) was conducted on the sampled cuttings and demonstrated an increase in total clay content from west to east within the Heimdal sandstone fairway. This suggested that the poor permeability observed in DST in eastern well 34/7-18 may not be representative for Heimdal sands in the Nelumbo prospect.

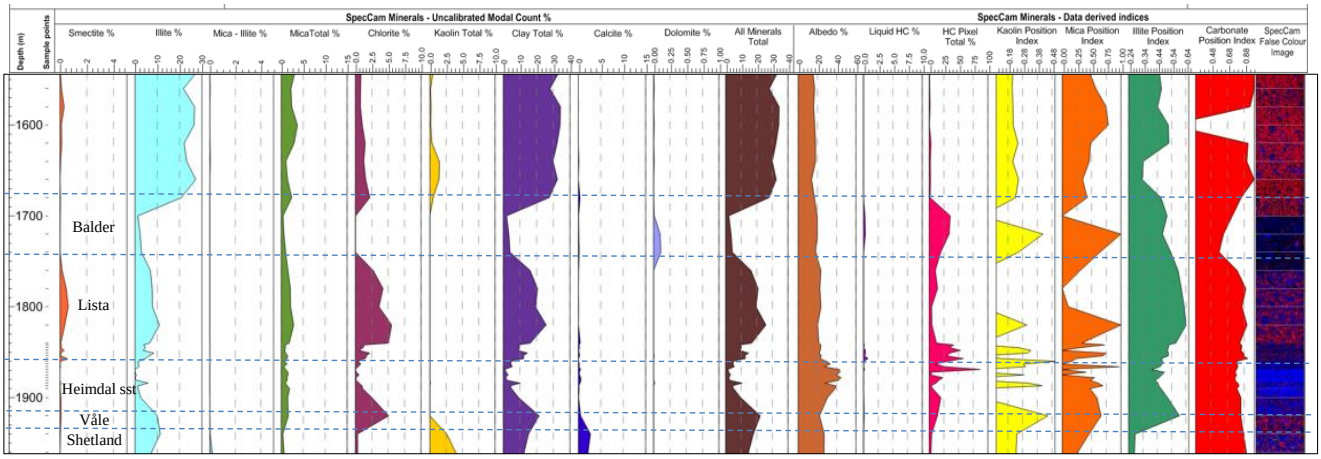

Fig. 3.2 SpecCam Analysis of Paleocene in well 33/9-22
Assessment of clay mineral composition of the Paleocene and within the Heimdal fm sst in particular.

4 Exploration well 33/9-22 S

The Goanna Prospect, on the northern flank of the Statfjord Field in Block 33/9, was defined by a mapped pinch-out of the Upper Jurassic (Tithonian) Munin Formation sandstone interval, up-dip from well 33/9-16. Definition of the pinch-out was considered well constrained as both the top and base of the reservoir could be mapped on the conditioned CGG BroadSeis seismic data with reasonable confidence given the proximity of the seismic-to-well tie at 33/9-16. The pre-drill prospect is illustrated with map and cross-section in Fig. 4.1 and Fig. 4.2.

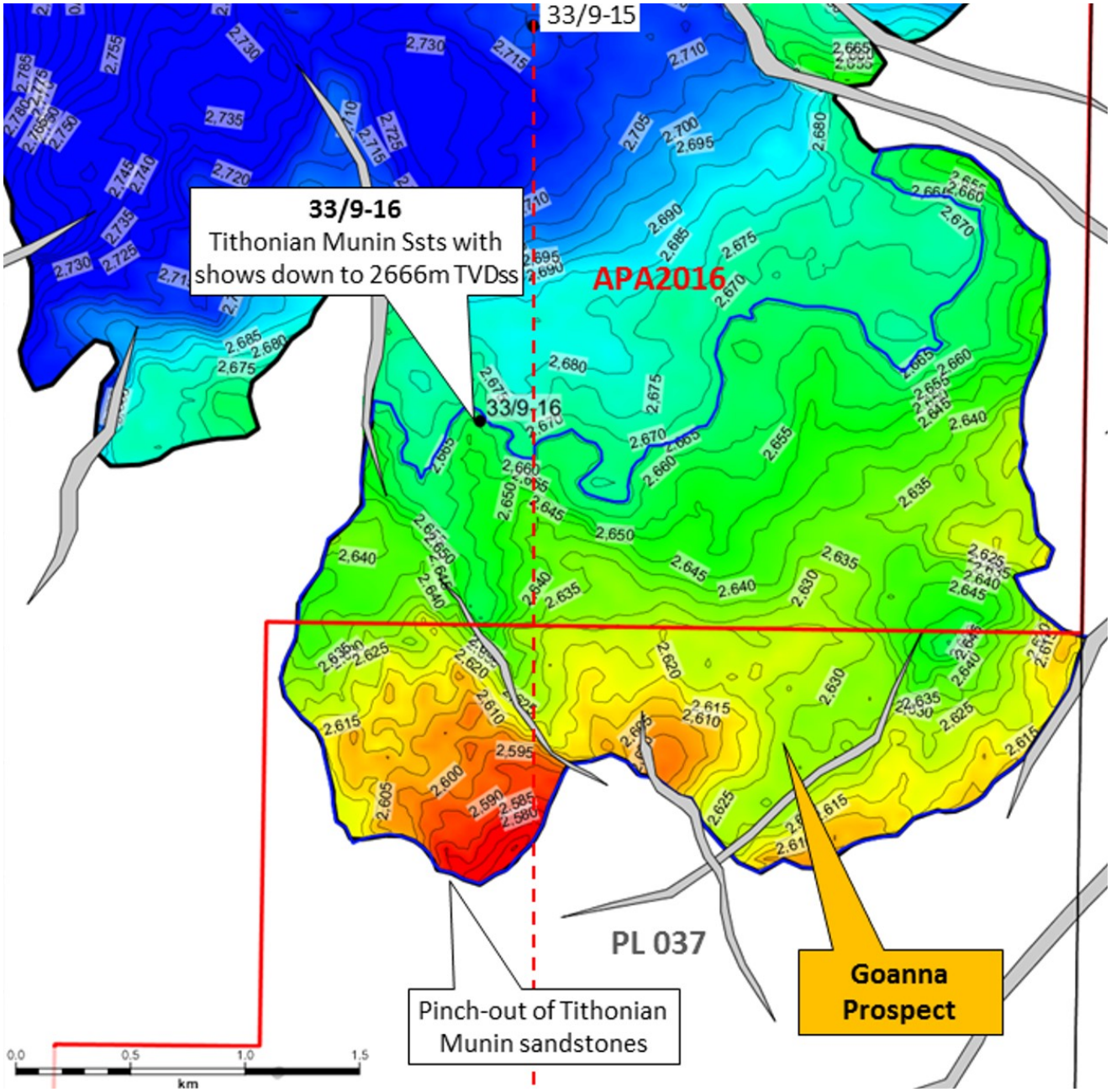

Fig. 4.1 Tithonian depth structure map for the Goanna prospect
Pre-drill depth map of Upper Jurassic Munin fm.

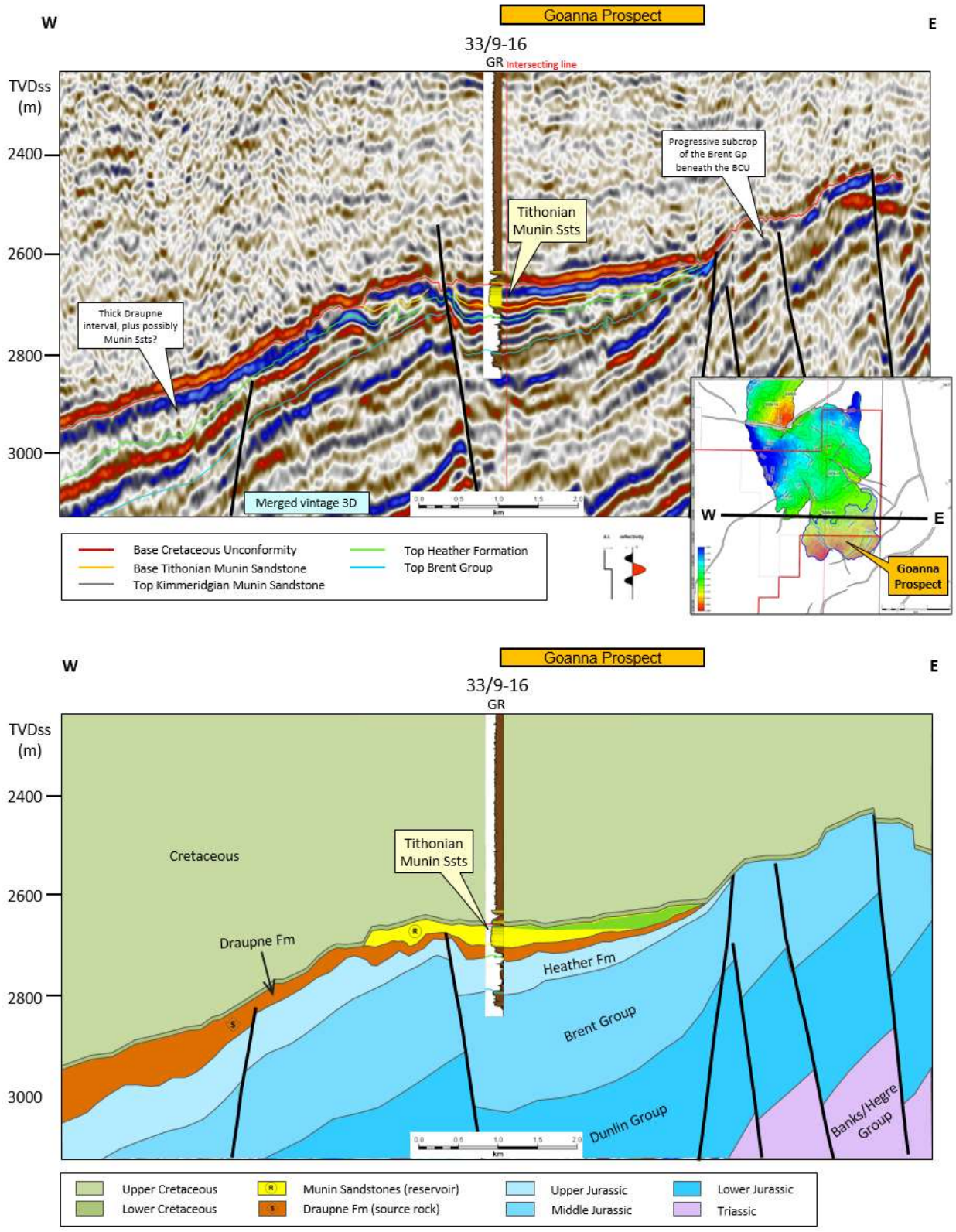

Fig. 4.2 Cross-section through the Goanna Prospect
Pre-drill west-east cross-section.

Goanna was matured to a drill-ready prospect and passed the decision to drill in June 2017.

Primary objective of the well was to test the prospect in an optimal position to prove commercial volumes in the Late Jurassic Munin sandstones (Tithonian/Intra Draupne), and to secure necessary data to enable a full evaluation in a discovery case. A secondary objective was to test possible hydrocarbon-charged sandstone of the Paleocene Heimdal Formation. The Odfjell Drilling semi-submersible rig Deepsea Bergen was employed, and the well was spudded on August 26th 2017 as 33/9-22 S.

Exploration well 33/9-22 S (NPDID: 8248)

A 9 7/8" pilot hole was drilled to 1102 m MD, below the Utsira Fm, without encountering any shallow gas or shallow water flow. The well was drilled to a TD at 2730 m MD (2715 m TVD RKB) in the Late Jurassic Draupne Formation. Operations proceeded without significant problems. The Heimdal Formation sandstone was penetrated from 1858 to 1897 m MD, and the Munin sandstone from 2672 to 2721 m MD. Both targets came in very close to depth prognosis, and both were found to be dry without shows. The 8 1/2" section was drilled with MWD for inclination control and GR/Res/DEN/NEU/Sonic/Probe for formation evaluation. A single USIT-CBL-GR wireline log was run. Both Munin and Heimdal sandstones were found to be of good quality. A CPI of the Munin Fm is shown in Fig. 4.3. Formation pressures confirmed a water gradient through the Munin Formation. FPWD pressure test values and depth plot are presented in Table 4.1 and Fig. 4.4 respectively. No cores were cut, and no fluid samples were taken.

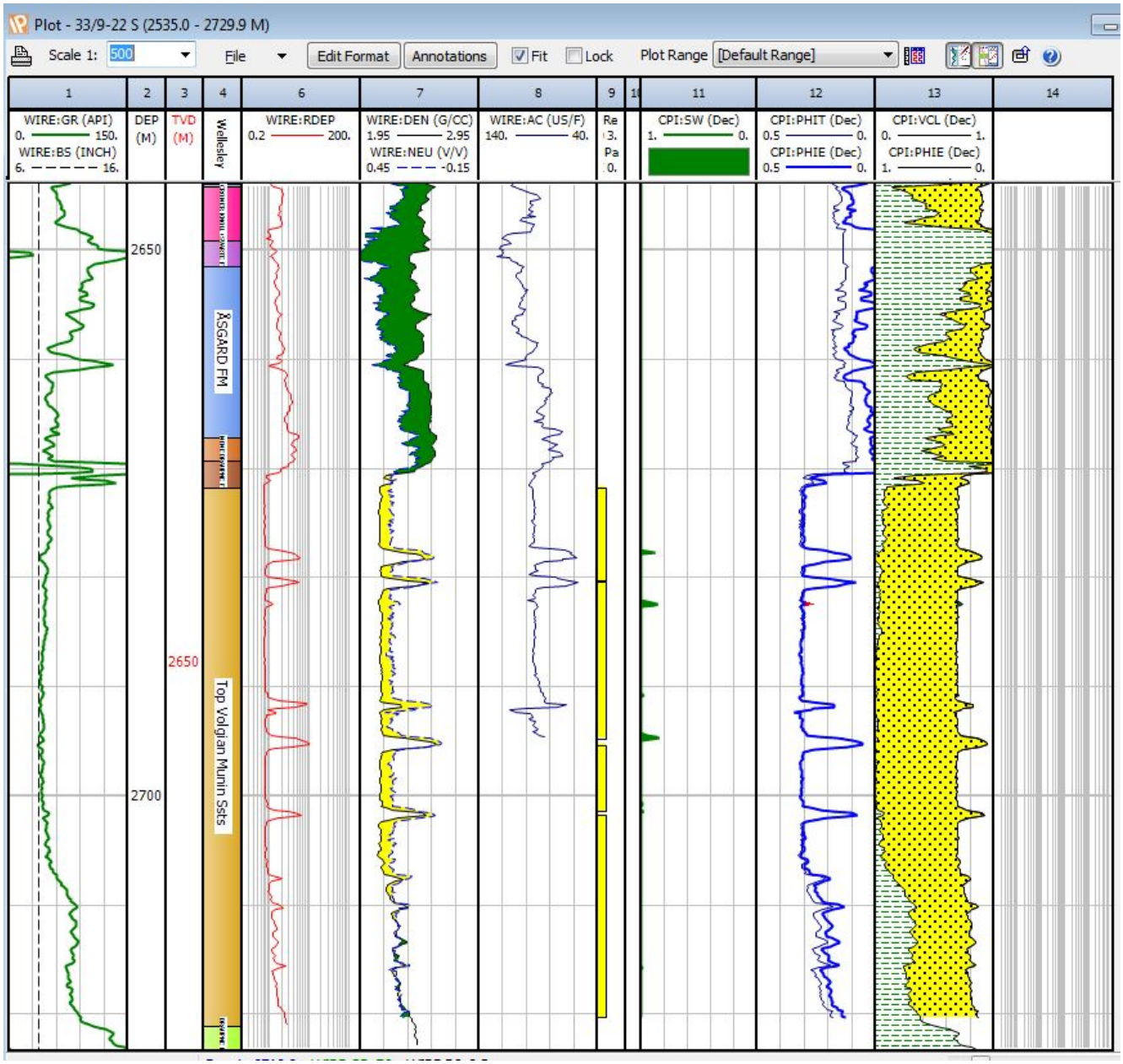

Fig. 4.3 33/9-22 S Munin Fm CPI

Munin fm was found to be of good quality with porosity 25-30% and a high N/G.

Table 4.1 FPWD: Test point table

Run No.	Test No.	Probe MD	Probe TVD	Date Time	Inv. BU Pres.	Final BU Pres.	Formation Pres.	Final DD Mobility	Mud Pres. Before	Pretest Type	Pretest Status	Probe Orient.	Equiv. Form. Density	Equiv. Mud Density	Comments
		m	m	dd/mm/yyyy HH:mm	bar	bar	bar	mD/cP	bar			deg	g/cm3	g/cm3	
4	1	2698.00	2683.32	10/9/2017 10:18:46 AM	329.420	329.430	329.430	2238.47	445.330	Type 1-B	Valid Test	22	1.25	1.69	Valid Test
4	2	2685.89	2671.22	10/9/2017 10:38:18 AM	328.250	328.250	328.250	1165.39	437.730	Type 1-B	Valid Test	22	1.25	1.67	Valid Test
4	3	2675.35	2660.68	10/9/2017 11:30:51 AM	327.190	327.200	327.200	2899.78	436.480	Type 1-A	Valid Test	22	1.25	1.67	Valid Test
4	4	2681.63	2666.96	10/9/2017 12:09:58 PM	327.800	327.800	327.820	1443.23	437.44	Type 1-A	Valid Test	22	1.25	1.67	Valid Test
4	5	2688.51	2673.84	10/9/2017 13:04:13 PM	437.380	328.510	328.510	31.09	436.12	Type 1-A	Valid Test	22	1.25	1.66	Valid Test

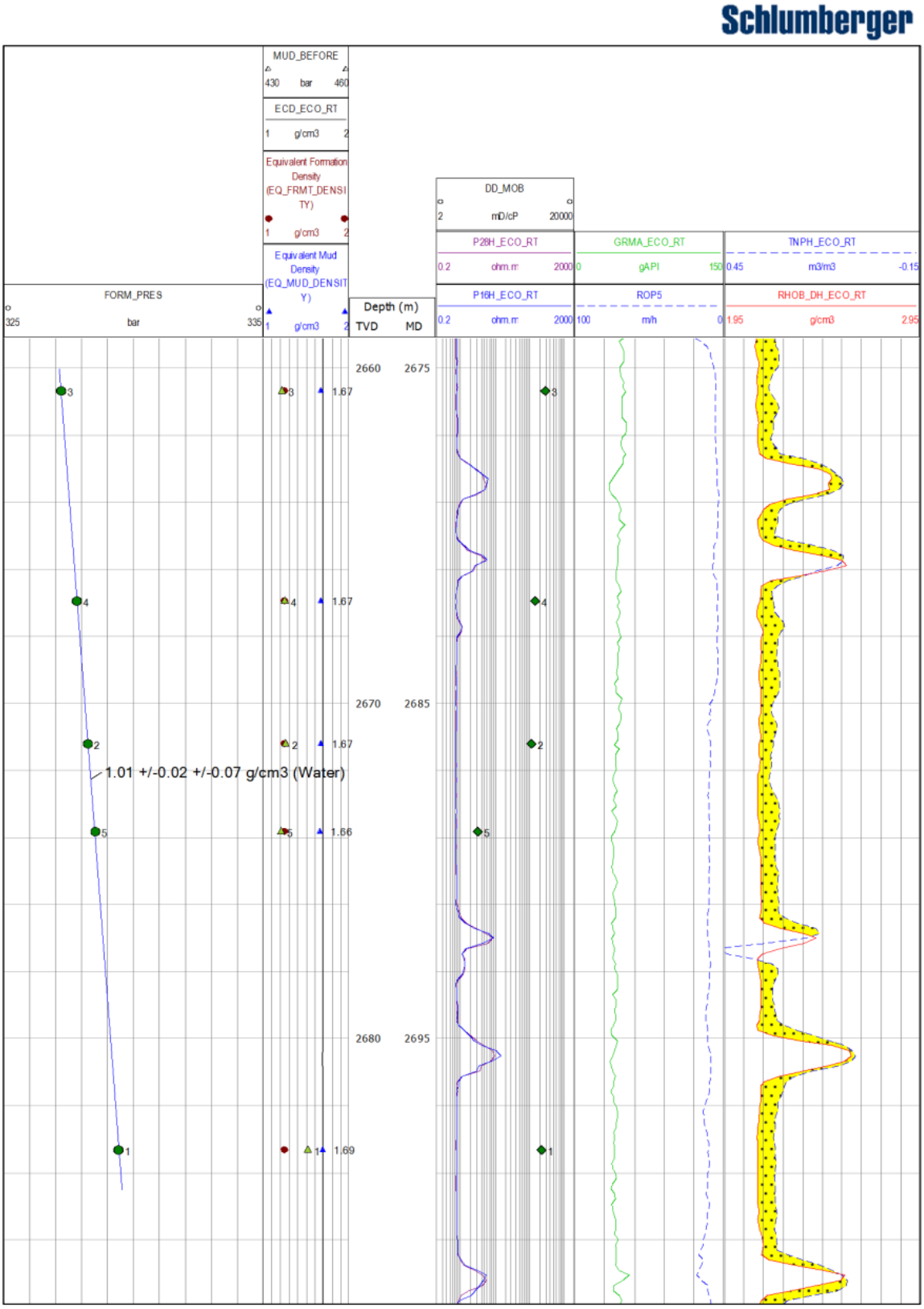

Fig. 4.4 33/9-22 S Munin Fm pressure measurement
FPWD test points of pressure and permeability.

5 Prospect update report

Goanna prospect

The Goanna Prospect was drilled with exploration well 33/9-22 S, and good quality reservoirs at both Upper Jurassic Intra Draupne and Paleocene Heimdal Fms were found to be dry without shows (4 Exploration well 33/9-22 S).

Skink prospect

The Skink prospect is a small (maximum areal extent 2.5 km^2) stratigraphic trap within the Upper Jurassic Intra Draupne Fm adjacent to well 33/9-15 (Fig. 5.1). The prospect has a minor 4-way closure, but is dependent on the stratigraphic component for substantial volume. Due to limited size, and the negative outcome of the Goanna exploration well, the Skink is not considered a drillable prospect. Table 5.1 shows the prospect data for Skink that was delivered in the APA 2016

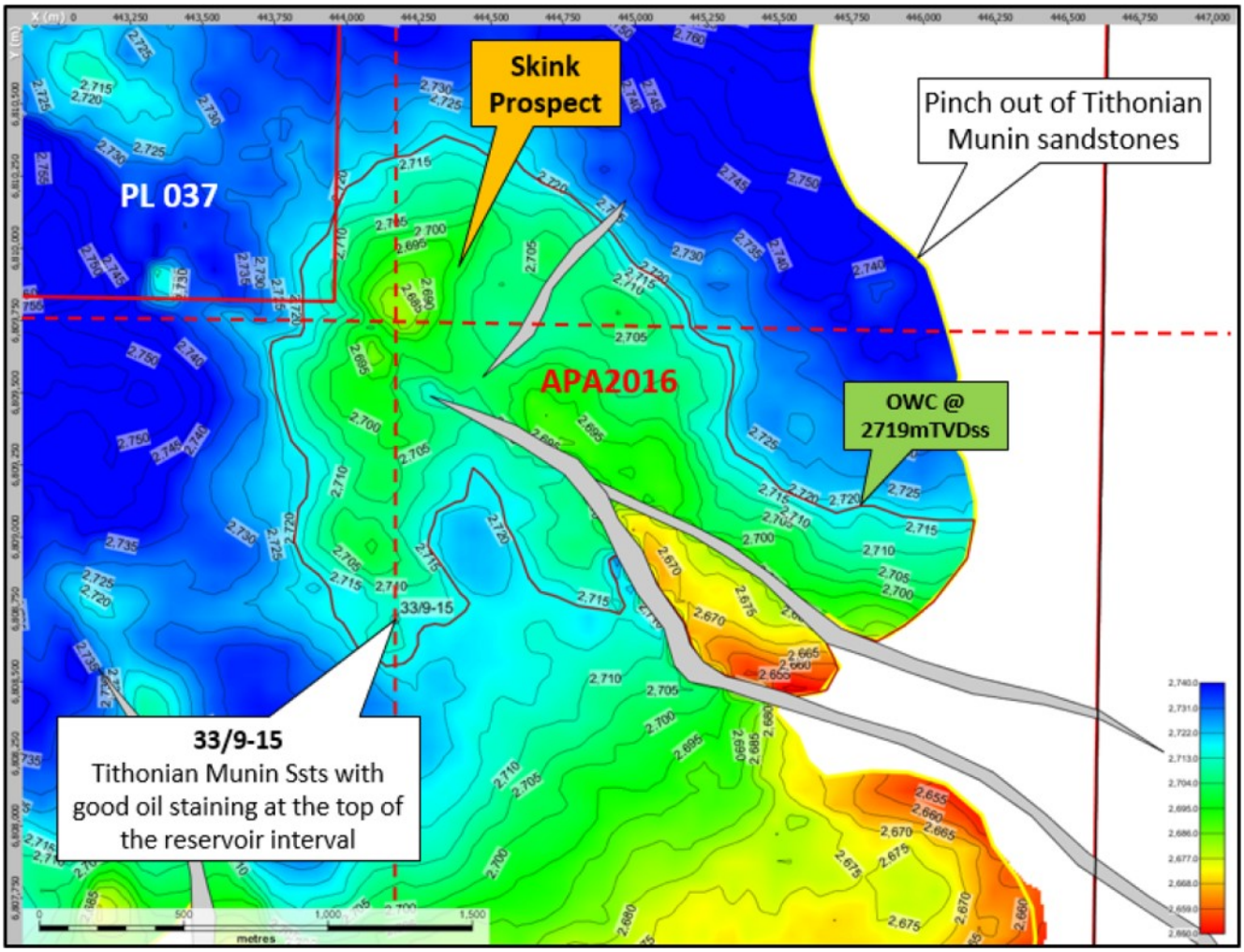

Fig. 5.1 Tithonian depth structure map for the Skink prospect
Depth structure map of top Tithonian Munin sandstone from APA 2016 application.

Table 5.1 Skink Prospect data APA 2016

Block	33/9	Prospect name	Skink	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	Wellesley	Reference document				Assessment year	2016
This is case no.:	1 of 1	Structural element	Tampen Spur	Type of trap	Stratigraphic	Water depth [m MSL] (>0)	230	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)	4.33	5.33	5.91	7.61				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1.53	2.14	2.40	3.40				
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Tithonian	Reservoir litho (from)	Munin Fm	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Draupne Fm	Seal, Chrono	Lwr Cretaceous
Reservoir Chrono (to)	Tithonian	Reservoir litho (to)	Munin Fm	Source Rock, chrono secondary	Kimmeridgian	Source Rock, litho secondary	Heather Fm	Seal, Litho	Cromer Knoll Gp
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.43	Oil case (0.00-1.00)	0.43	Gas case (0.00-1.00)	0.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	1.00	Trap (P2) (0.00-1.00)	0.60	Charge (P3) (0.00-1.00)	0.90	Retention (P4) (0.00-1.00)	0.80		
Parametres:	Low (P90)	Base	High (P10)	*Comments*					
Depth to top of prospect [m MSL] (> 0)	2650	2650	2650						
Area of closure [km^2] (> 0.0)	2.5	2.5	2.5						
Reservoir thickness [m] (> 0)	10	30	50						
HC column in prospect [m] (> 0)	69	69	69						
Gross rock vol. [10^9 m^3] (> 0.000)	0.034	0.043	0.052						
Net / Gross [fraction] (0.00-1.00)	0.70	0.80	0.90						
Porosity [fraction] (0.00-1.00)	0.26	0.28	0.30						
Permeability [mD] (> 0.0)	200.0	1000.0	4000.0						
Water Saturation [fraction] (0.00-1.00)	0.15	0.20	0.25						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0.71	0.77	0.83						
GOR, free gas [Sm^3/Sm^3] (> 0)	35	55	75						
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.30	0.40	0.53						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
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)	94			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)	385			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. Vcl <0.5	2. PHIE >0.1	3.					Kart nr	NPD will insert value

Nelumbo/Freddy prospect

The Freddy Prospect is a low relief stratigraphic trap within the Paleocene Heimdal formation. The prospect was originally mapped as a larger closure, Nelumbo, for the APA 2016 application. The Nelumbo Prospect included the two Statfjord development wells 33/9-G-3H and 33/9-G-4H which encountered minor oil columns, OWCs at 1767 m TVDSS and 1774 m TVDSS respectively, within the Heimdal sandstones. It was believed that the actual OWC could potentially be deeper, due to significant fluorescence in the sandstones below apparent drop in resistivity for these two wells. The Nelumbo Prospect had an upside case with structural closure at 1800 m TVDSS. The subsequent post-award analysis has not given support to a deeper OWC, though the G-3H and G-4H wells prove access to oil-charge at the Heimdal level. The prospect was remapped on the conditioned CGG BroadSeis 3D seismic data, which provided a major uplift in the imaging of top and base Heimdal sst, and confirmed the interpreted presence of a stratigraphic pinch-out of the Heimdal sst to the north and south as shown in the composite seismic section in Fig. 5.2. Line location is shown on the Top Heimdal structure map in Fig. 5.3. The structure map demonstrates an independent closure, Freddy Prospect, within the PL881 license. The prospect relies on a stratigraphic trap edge towards the south.The Freddy Prospect is assumed to have an OWC independent of the shallower contacts in G-3H and G-4H. A P50 for the an oil accumulation is defined as the saddle point between the known oil accumulation and the prospect at 1779 m TVDSS. An upside is assumed from the uncertainty in the depth conversion which could depress the saddle to 1792 m as a P10. The migration into Heimdal sands is proven by the oil accumulation in offset wells 33/9 G-3H and 33/9 G-4H. However, the Freddy Prospect is further away from faulting than G-3H and G-4H and may depend on spill-fill through the saddle which is not supported by the observed OWC's. The migration risk into Freddy is thus considered significant, and combined with a limited size, the Freddy Prospect is not considered a drillable prospect. Table 5.2 shows the prospect data for Nelumbo that was delivered in the APA 2016, while Table 5.3 shows revised prospect data for Freddy.

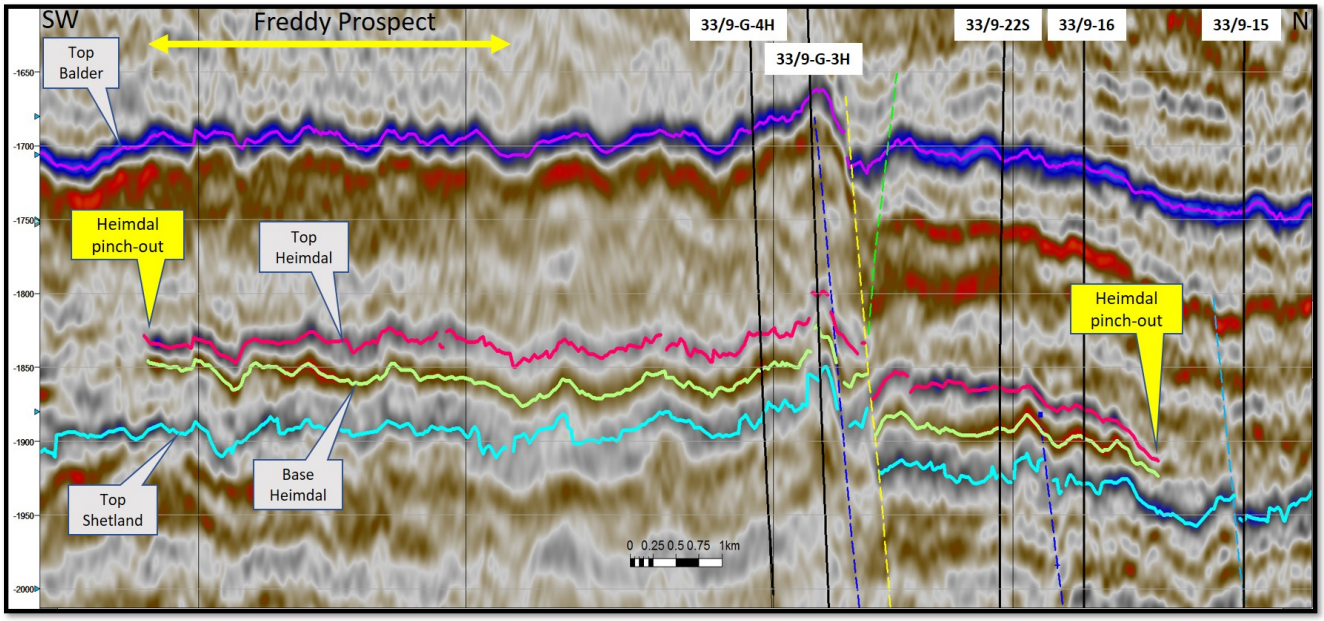

Fig. 5.2 Composite seismic line - Freddy prospect
Conditioned CGG BroadSeis. Line location on Fig. 5.3

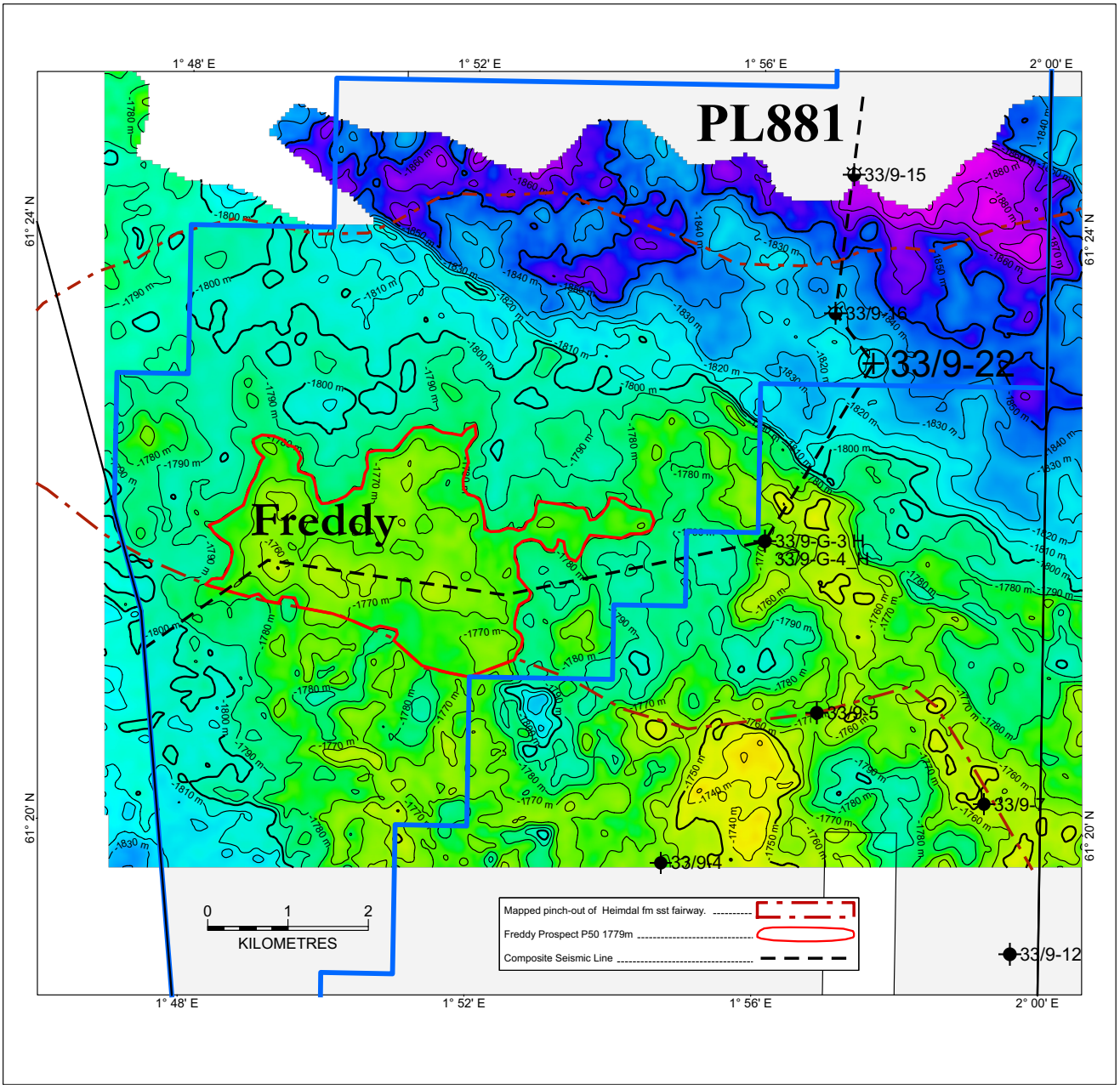

Fig. 5.3 Top Heimdal sst depth structure map for Freddy prospect

Table 5.2 Nelumbo Prospect data, APA 2016

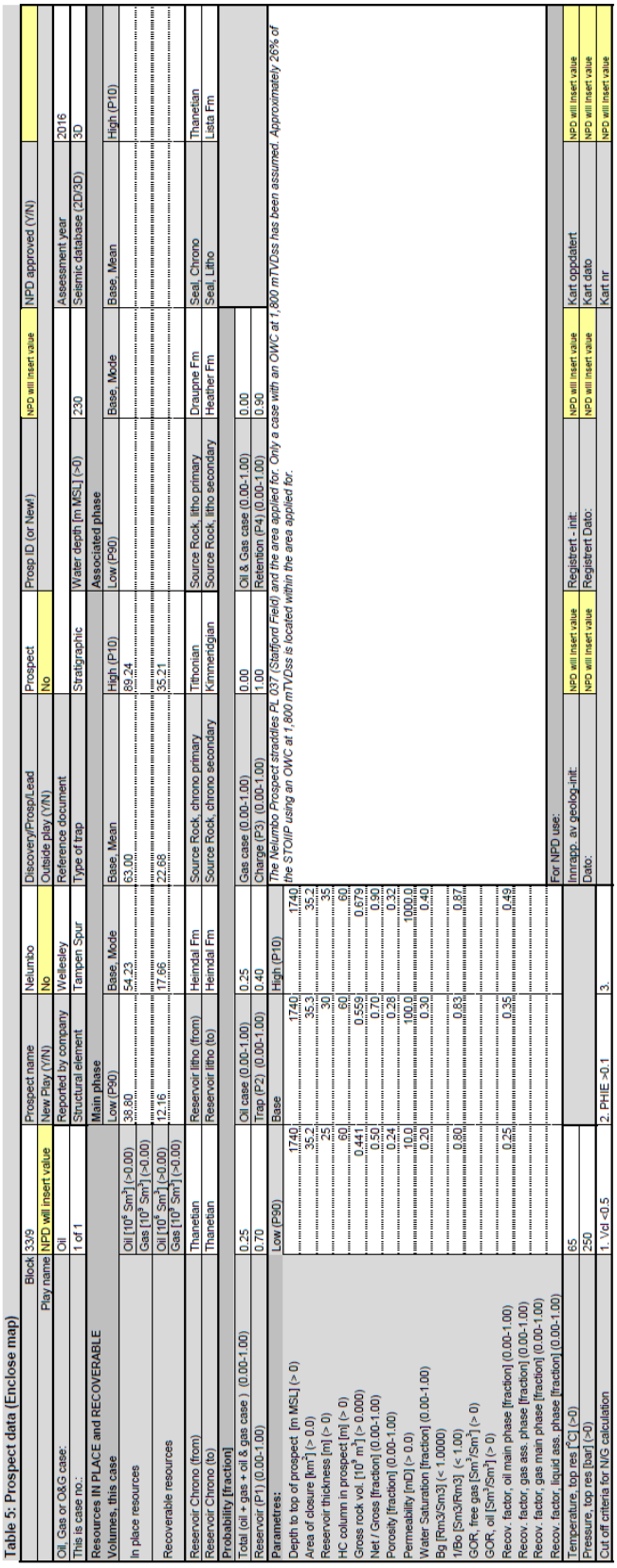

Table 5: Prospect data (Enclose map)

Block	33/9	Prospect name	Nelumbo	Discovery/Prospect 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	Wellesley	Reference document				Assessment year	2016
This is case no.:	1 of 1	Structural element	Tampen Spur	Type of trap	Stratigraphic	Water depth [m MSL] (>0)	230	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)	38.80	54.23	63.00	89.24				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	12.16	17.56	22.68	35.21				
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Thanetian	Reservoir litho (from)	Heimdal Fm	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Draupne Fm	Seal, Chrono	Thanetian
Reservoir Chrono (to)	Thanetian	Reservoir litho (to)	Heimdal Fm	Source Rock, chrono secondary	Kimmeridgian	Source Rock, litho secondary	Heather Fm	Seal, Litho	Lista Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.25	Oil case (0.00-1.00)	0.25	Gas case (0.00-1.00)	0.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	0.70	Trap (P2) (0.00-1.00)	0.40	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	0.90		
Parametres:	Low (P90)	Base	High (P10)	*The Nelumbo Prospect straddles PL 037 (Statfjord Field) and the area applied for. Only a case with an OWC at 1,800 mTVDss has been assumed. Approximately 26% of the STOIIP using an OWC at 1,800 mTVDss is located within the area applied for.*					
Depth to top of prospect [m MSL] (> 0)	1740	1740	1740						
Area of closure [km^2] (> 0.0)	35.2	35.2	35.3						
Reservoir thickness [m] (> 0)	25	30	35						
HC column in prospect [m] (> 0)	60	60	60						
Gross rock vol. [10^9 m^3] (> 0.000)	0.441	0.529	0.793						
Net / Gross [fraction] (0.00-1.00)	0.59	0.70	0.90						
Porosity [fraction] (0.00-1.00)	0.24	0.28	0.32						
Permeability [mD] (> 0.0)	10.0	100.0	1000.0						
Water Saturation [fraction] (0.00-1.00)	0.20	0.30	0.40						
Bg [Rm3/Sm3] (< 1.0000)	0.80	0.83	0.87						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.35	0.45	0.55						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
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)	65			Innlagp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	250			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for NtG calculation	1. Vcl <0.5	2. PHIE >0.1	3.					Kart nr	NPD will insert value

Table 5.3 Freddy Prospect data

Table 5: Prospect data (Enclose map)

Block	33/9	Prospect name	Freddy	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	Wellesley	Reference document				Assessment year	2016
This is case no.:	1 of 1	Structural element	Tampen Spur	Type of trap	Stratigraphic	Water depth [m MSL] (>0)	230	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)	3.19	9.08	14.34	27.58				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1.03	2.92	4.36	9.86				
	Gas [10^9 Sm^3] (>0.00)								
Reservoir Chrono (from)	Thanetian	Reservoir litho (from)	Heimdal Fm	Source Rock, chrono primary	Tithonian	Source Rock, litho primary	Draupne Fm	Seal, Chrono	Thanetian
Reservoir Chrono (to)	Thanetian	Reservoir litho (to)	Heimdal Fm	Source Rock, chrono secondary	Kimmeridgian	Source Rock, litho secondary	Heather Fm	Seal, Litho	Lista Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.19	Oil case (0.00-1.00)	0.19	Gas case (0.00-1.00)	0.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	0.70	Trap (P2) (0.00-1.00)	0.90	Charge (P3) (0.00-1.00)	0.30	Retention (P4) (0.00-1.00)	1.00		
Parametres:	Low (P90)	Base	High (P10)	*The Freddy Prospect is 100% within the PL881 license. The upside (P90) assumes a depth uncertainty with a deeper saddle towards the east, and spill towards west .*					
Depth to top of prospect [m MSL] (> 0)	1750	1750	1750						
Area of closure [km^2] (> 0.0)	2.6	8.0	14.5						
Reservoir thickness [m] (> 0)	33	33	33						
HC column in prospect [m] (> 0)	17	29	42						
Gross rock vol. [10^9 m^3] (> 0.000)	0.027	0.076	0.224						
Net / Gross [fraction] (0.00-1.00)	0.70	0.80	0.90						
Porosity [fraction] (0.00-1.00)	0.24	0.26	0.28						
Permeability [mD] (> 0.0)	10.0	100.0	1000.0						
Water Saturation [fraction] (0.00-1.00)	0.20	0.30	0.40						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0.80	0.83	0.87						
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.25	0.35	0.45						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
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)	65			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)	250			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. Vcl <0.5	2. PHIE >0.1	3.					Kart nr	NPD will insert value

6 Technical evaluation

Development scenarios were derived for the Freddy Prospect based on the P10 upside case volumetrics. The Top Heimdal depth map suggests a possible deep spill point at 1792 m TVDSS assuming a favourable uncertainty in the depth conversion, with a P10 area of 14.5 km^2 for the prospect. An upside case of the reservoir properties allows for a permeability range of 10-1000 mD. Using empirical estimates based on temperature, depth and fluids encountered in offset wells at Heimdal level, the viscosity is expected to be 20-70 cp. This gives mobilities less than 1cp/mD which are impractical for a commercial development and significantly below any working analogues. The limited structural relief of the Top Heimdal within P10 closure yields insufficient height for adequate long completions, which would preferably be set 30 m above the assumed OWC. Horizontal completions of reasonable length will therefore need to be within 20-25 m above the OWC. If we accept the upside reservoir properties in addition to the P10 structural closure, volume weighted saturations will be more than 50% Sw. Thus, horizontal completions will be in high Sw layers and most likely still in the transition zone.

The development considerations show that a combination of high Sw and low mobility will not allow decent recovery before the wells water out, even in the P10 case. With the current geological PoS of 0.19, the Freddy prospect is not considered attractive to drill.

7 Conclusion

Phase 1 of the work program leading up to the Drill-or-Drop decision has been fulfilled by buying the CGG Broadseis Broadsource seismic survey, maturing the Goanna prospect to a drill decision and drilling Well 33/9-22 S. Post well studies and technical evaluations indicate that the remaining prospectivity in the license is not viable to pursue any further.

8 References

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