PL652 Relinquishment Report

1. Key license history

PL652 was awarded on 3rd February 2012 and consists of part of block 6608/7 and 6608/8. Wintershall Norge ASA (35%) was the operator with E.ON Ruhrgas Norge AS (25%), Det norske oljeselskap ASA (20%) and Concedo ASA (20%) as partners. In February 2012 E.ON Ruhrgas Norge AS changed its company name to E.ON E&P Norge AS. In March 2012 Wintershall Norge ASA changed its company name to Wintershall Norge AS.

The initial work obligation including a study of geology and geophysics are fulfilled. EC/MC meetings were hold once a year, in addition there was a kick-off meeting.

The license area is located on the Dønna Terrace, northwest of the Dompap and Linerle discoveries. The application for the area focused on two Jurassic prospects (Spettmeis and Toppmeis) and one Cretaceous lead (Osp). After detailed area and prospect evaluation the potential volumes are too small and the probability of discovery is too low to defend a drill decision. Even a combined evaluation together with the Svartmeis prospect in PL561 could not justify a drill decision. The decision to relinquish the license was unanimous among operator and partners.

2. Database

The initial database for the APA 2011 application is shown in Figure 1. The main seismic dataset used for the evaluation of PL652 was ST9405MR10, the reprocessed seismic of PL561 work commitment (for details see “PL561 Relinquishment report”).

3. Review of geological framework

The new seismic dataset of ST9405MR10 gives a good image at the prospects depth. An AVO analysis highlights the Dompap discovery, but gives no indications for hydrocarbon presence at the Spettmeis prospect or Osp lead.

4. Prospect update

The new seismic dataset ST9405MR10 has been used in geophysical and geological evaluation of the license area. This includes seismic mapping of all relevant horizons and faults, and amplitude analysis. Geological studies have covered petrophysical analysis, hydrocarbon charge studies, hydrocarbon phase prediction and resource and risk assessment for prospect evaluation.

The Spettmeis prospect is a downthrown fault block relative to the Dompap discovery (Figure 3 and 4). It has the largest recoverable volumes (mean: 7.90*10^6 SM^3 oil and 1.50*10^9 Sm^3 associated gas) in PL652 and a GPOS of 30%. Trap and seal are the main risks. The complex structure is formed by bounding and internal faults and truncated by the BCU erosion line. Uncertainties about the bottom seal increases the risk.

However a combined evaluation of Spettmeis and Svartmeis (PL561) prospects was made in order to make both prospects economic. Unfortunately the outcome of the evaluation does not justify a drill decision.

The Osp lead could not be matured to a prospect. Depositional models for potential sandstones show that trap is the main risk.

The volumes and risk of the Toppmeis prospect are not revised.

The Fasan lead was identified in the Lysing Fm. Its main risk is trap. Large parts lie outside PL652.

5. Technical evaluations

A combined production, facility and economic evaluation was completed for the Svartmeis prospect (PL561) and Spettmeis prospect (PL652). The main scenario considered an exploration well and sidetrack at the Spettmeis prospect and, if successful, an exploration well and sidetrack at the Svartmeis prospect. Dependent on the Spettmeis exploration outcome, 3 to 11 production wells and 2 to 4 water injectors are needed. Subsea tie back scenarios to the Norne platform were designed. The field layout includes a subsea template, a cooling unit and a HIPPS. Production start was assumed to be in 2021 (Figure 5).

The performed technical evaluation also showed that the volumes in the Toppmeis prospect are too small to be it economic.

6. Conclusions

The extensive work program carried out gave a good picture of the GPOS and HC volumes expected in PL652 and the Spettmeis and Toppmeis prospects. The combined development economic evaluation of the PL561 and PL652 was positive, but not sufficient to make a drill decision at this stage.

The decision to relinquish PL652 was taken unanimous.

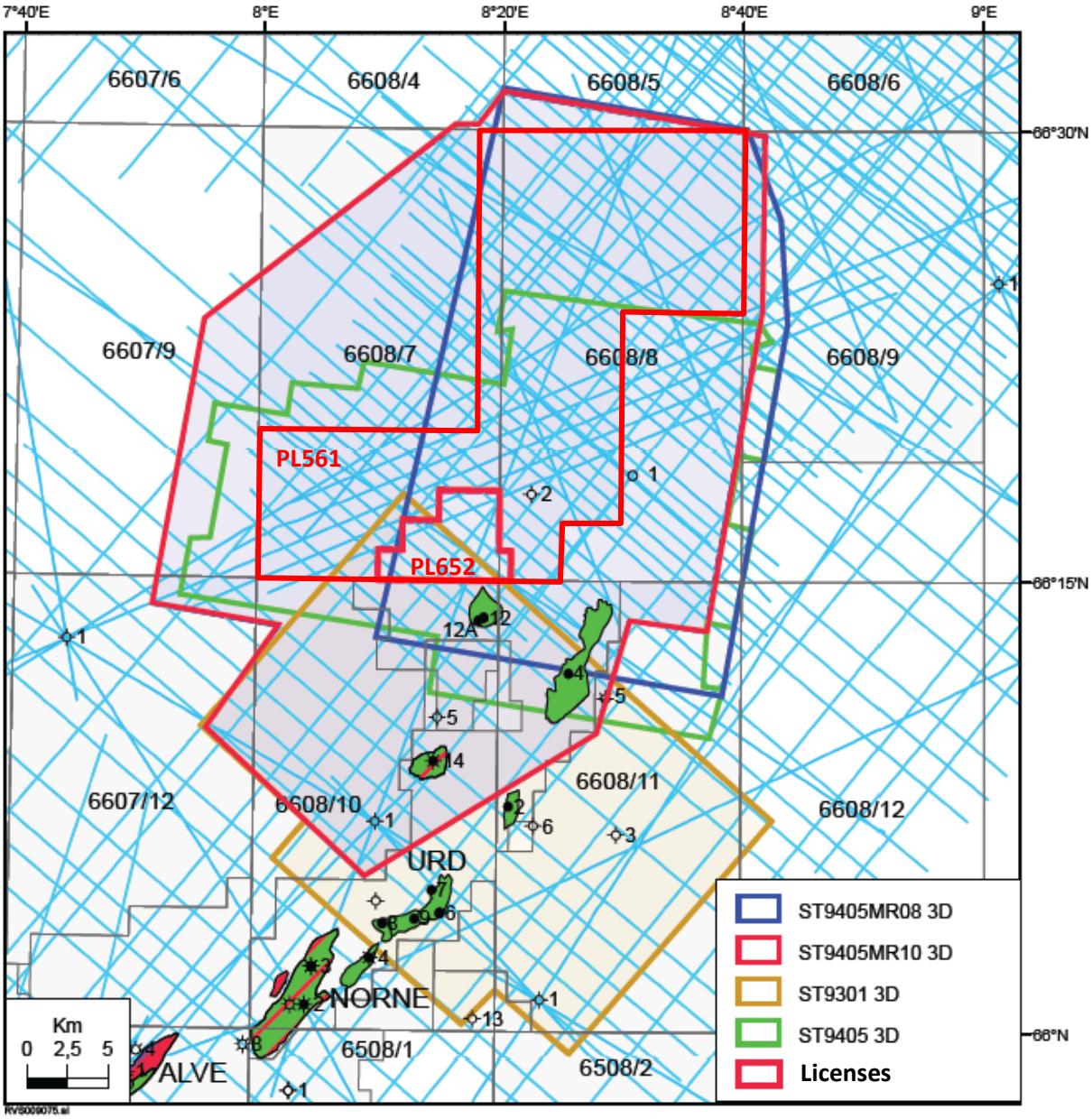

Figure 1: Seismic database.

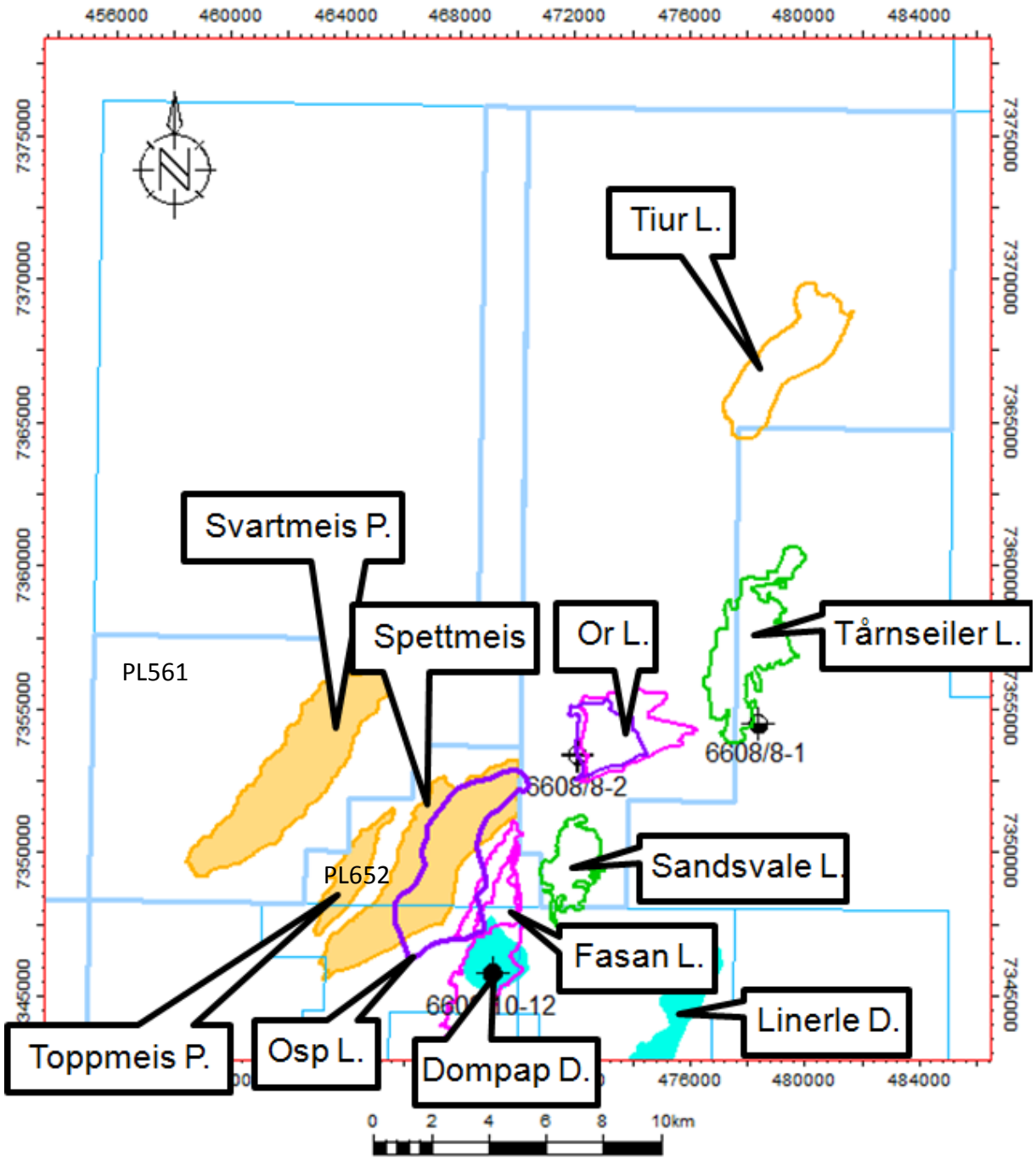

Figure 2: PL561 and PL652 location map showing the prospects and leads west-northwest of the Dompap and Linerle discoveries.

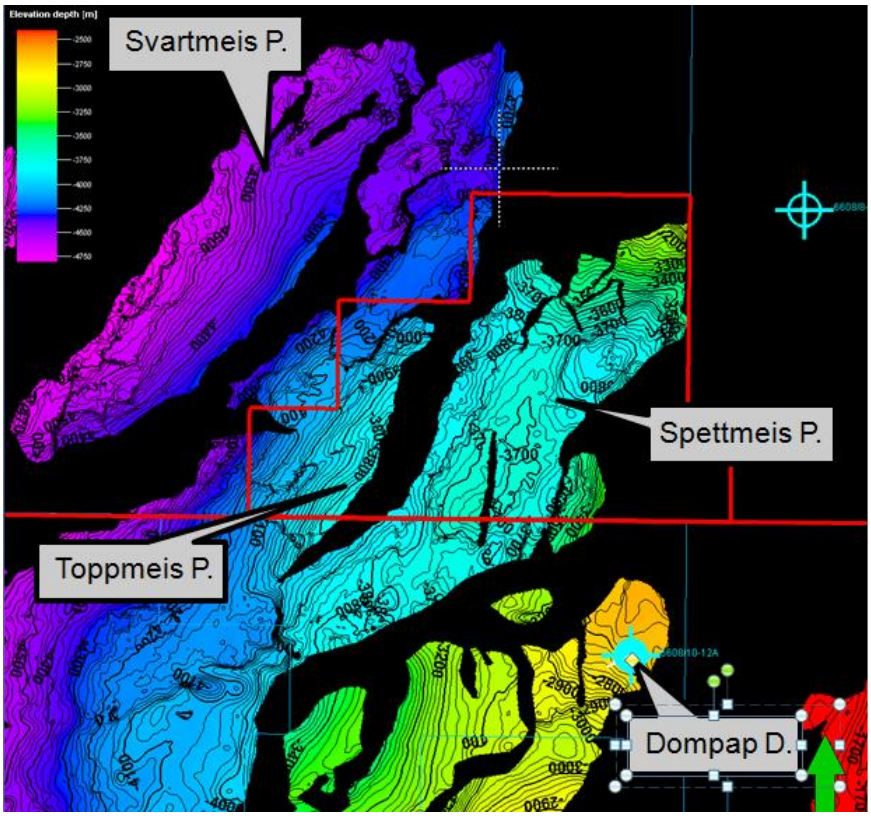

Figure 3: Top Åre Fm depth map showing locations of Jurassic prospects and Dompap discovery. CI = 20 m.

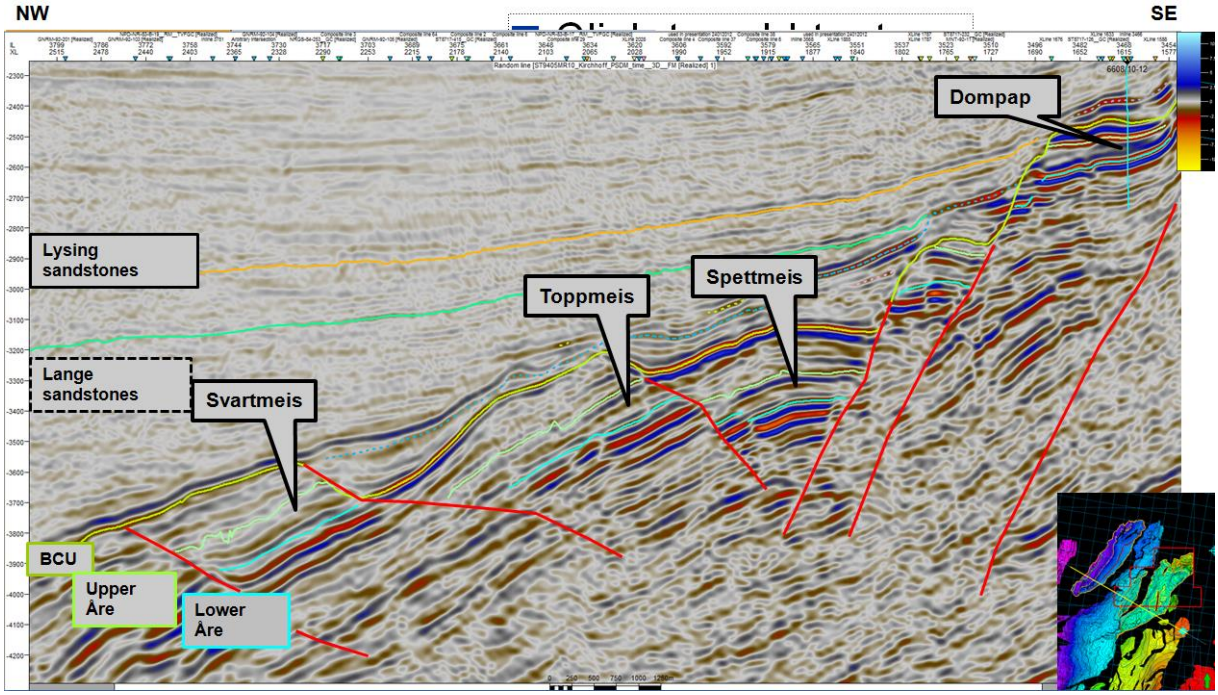

Figure 4: Seismic cross section of the reprocessed ST9405MR10 showing the reinterpreted prospects Spettmeis, Toppmeis and Svartmeis, as well as the Dompap discovery and potential Lysing and Lange sandstones.

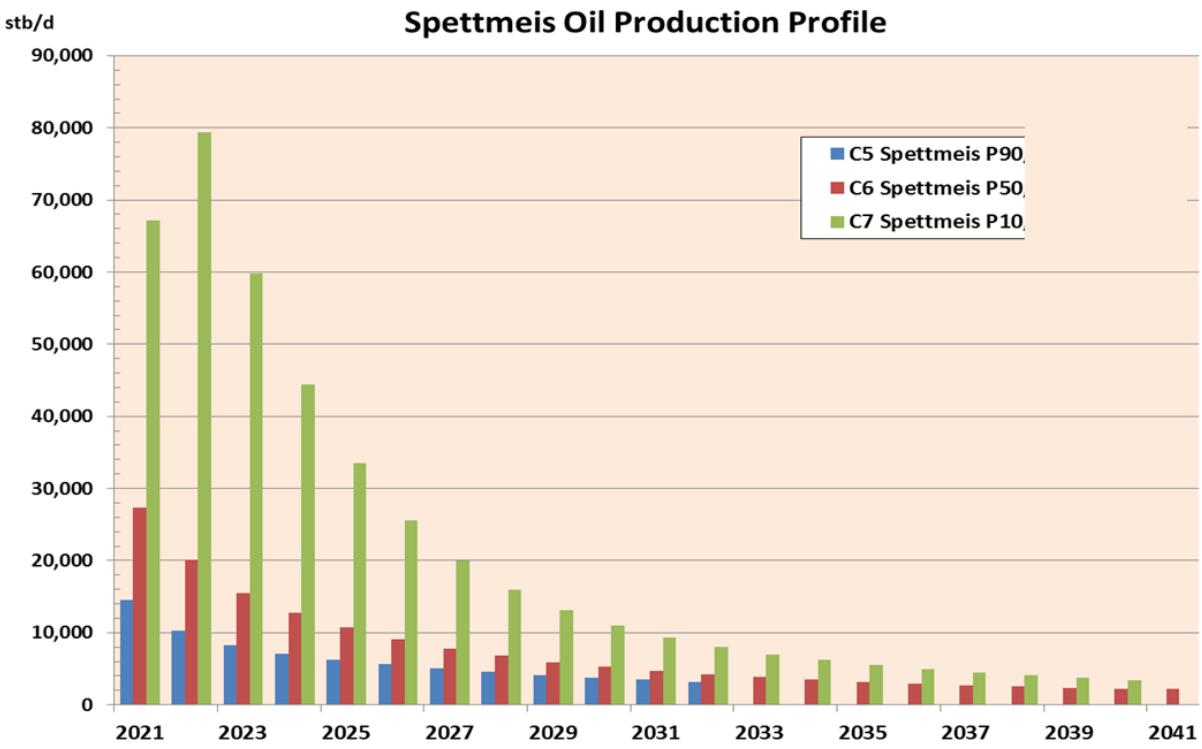

Figure 5: Production profile for the Spettmeis prospect.

Table 1: Prospect Data.

Block	6608/7	Prospect name	Spettmeis	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)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Wintershall Norge A	Reference document				Assessment year	2013
This is case no.:		Structural element	Dønna Terrace	Type of trap	Struct. 3-way	Water depth [m MSL] (>0)	350	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)	3,60	6,21	25,00	59,90				
	Gas [10^9 Sm^3] (>0.00)								
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1,00	1,49	7,90	18,70				
	Gas [10^9 Sm^3] (>0.00)					0,17	0,23	1,50	3,50
Reservoir Chrono (from)	Rhaetian	Reservoir litho (from)	Åre Fm	Source Rock, chrono primary	Oxfordian to Tithon	Source Rock, litho primary	Spekk Fm	Seal, Chrono	Callovian
Reservoir Chrono (to)	Sinemurian	Reservoir litho (to)	Åre Fm	Source Rock, chrono secondary	Rhaetian to Hettan	Source Rock, litho secondary	Åre Fm	Seal, Litho	Melke Fm
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0,30	Oil case (0.00-1.00)	0,30	Gas case (0.00-1.00)	0,00	Oil & Gas case (0.00-1.00)	0,00		
Reservoir (P1) (0.00-1.00)	0,90	Trap (P2) (0.00-1.00)	0,60	Charge (P3) (0.00-1.00)	0,80	Retention (P4) (0.00-1.00)	0,70		

Parametres:	Low (P90)	Base	High (P10)
Depth to top of prospect [m MSL] (> 0)		3150	
Area of closure [km^2] (> 0.0)		18,0	
Reservoir thickness [m] (> 0)	115	166	223
HC column in prospect [m] (> 0)	326	533	713
Gross rock vol. [10^9 m^3] (> 0.000)	0,131	0,749	1,772
Net / Gross [fraction] (0.00-1.00)	0,32	0,48	0,66
Porosity [fraction] (0.00-1.00)	0,12	0,16	0,21
Permeability [mD] (> 0.0)			
Water Saturation [fraction] (0.00-1.00)	0,20	0,32	0,45
Bg [Rm3/Sm3] (< 1.0000)			
1/Bo [Sm3/Rm3] (< 1.00)	0,67	0,63	0,59
GOR, free gas [Sm^3/Sm^3] (> 0)			
GOR, oil [Sm^3/Sm^3] (> 0)	125	183	249
Recov. factor, oil main phase [fraction] (0.00-1.00)	0,20	0,32	0,45
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0,20	0,32	0,45
Recov. factor, gas main phase [fraction] (0.00-1.00)			
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)			
Temperature, top res [°C] (>0)	116		
Pressure, top res [bar] (>0)	331		
Cut off criteria for N/G calculation	1.	2.	3.

Comments

For NPD use:					
Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
				Kart nr	NPD will insert value