


RELINQUISHMENT REPORT

PL 475 and 475 D

Rodriguez and Solberg

Solberg and Rodriguez

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PL 475 and PL475 D Relinquishment Report

Prepared by Wintershall Norge AS

April 2016

Table of Contents

1 Key License History	1
2 Database	3
3 Review of geological framework	5
4 Prospect Update	6
5 Technical evaluations	10
6 Conclusions.....	11
7 References	12

List of Figures

1.1 Location Map of PL475 and PL475D 2
2.1 3D seismic Coverage 4
4.1 Top Garn Formation Depth Structure Map 7
4.2 Base Intra Lange Sandstone Depth Structure Map 8
4.3 Seismic Composite Line through Rodriguez and Solberg 9

1 Key License History

Production License 475 was awarded to Revus Energy ASA (30% w.i.), Faroe Petroleum Norge AS (30%), Centrica Resources (Norge) AS (20%) and Concedo ASA (20%) after the APA 2007, and became effective on 29th of February 2008. The license covers part of blocks 6406/3, and 6407/7 in the Mid Norwegian Sea for a total of 152,33 km². At the time of relinquishment the licensees were Wintershall Norge AS (operator 35%), Faroe Petroleum Norge AS (20%), Centrica Resources (Norge)AS (20%), Moeco Oil & Gas Norge AS (15%), and Spike Exploration AS (10%).

The work commitment of the license included G&G Studies, reprocessing 3D seismic, and drilling of an exploration well. The commitment was fulfilled with the merging and reprocessing of 355km² of the master survey ST0614, 156km² of the ST9905 and 130 km² of the MGW98. Drilling of the exploration well 6407/1-6 S (Rodriguez) in 2012/2013 completed the work obligation as stated by the JOA. The well spudded 7th of December 2012 with Transocean Artic and resulted in a gas-condensate discovery in the intra Lange Formation sandstones. The main targets in the Middle Jurassic Garn and Ile Formations were dry. The well reached TD 24th of January in 2013.

Following the discovery, exploration well 6407/1-7 (Solberg) was planned and drilled in order to prove gas-condensate in what was prognosed as thicker sandstone units with better reservoir quality 5 km east of 6407/1-6 S. Gas-condensate was proven as prognosed in well 6407/1-7 and a deep side-track, 6407/1-7 A, was drilled 500m to the west in order to investigate the sand extension and reservoir communication. The well spudded on first of February 2014 and was drilled with Borgland Dolphin. The appraisal well reached TD the fourth of April 2014.

An area extension of the license, PL475D, was awarded 7th of February 2014 with the same work commitment as PL475. The license covers parts of block 6407/1 for a total of 156,986 km².

In order to evaluate the reserves of the Solberg and Rodriguez discoveries and upside potential within the area, part of the license group agreed to purchase the HVG2013 and PGS14002 broadband 3D seismic dataset. A full economical evaluation was performed based on the interpretation of new seismic dataset. However, the remaining prospectivity were considered too limited and risky for any further appraisal activity and development and the license was relinquished with unanimous decision within the JV. (Fig. 1.1)

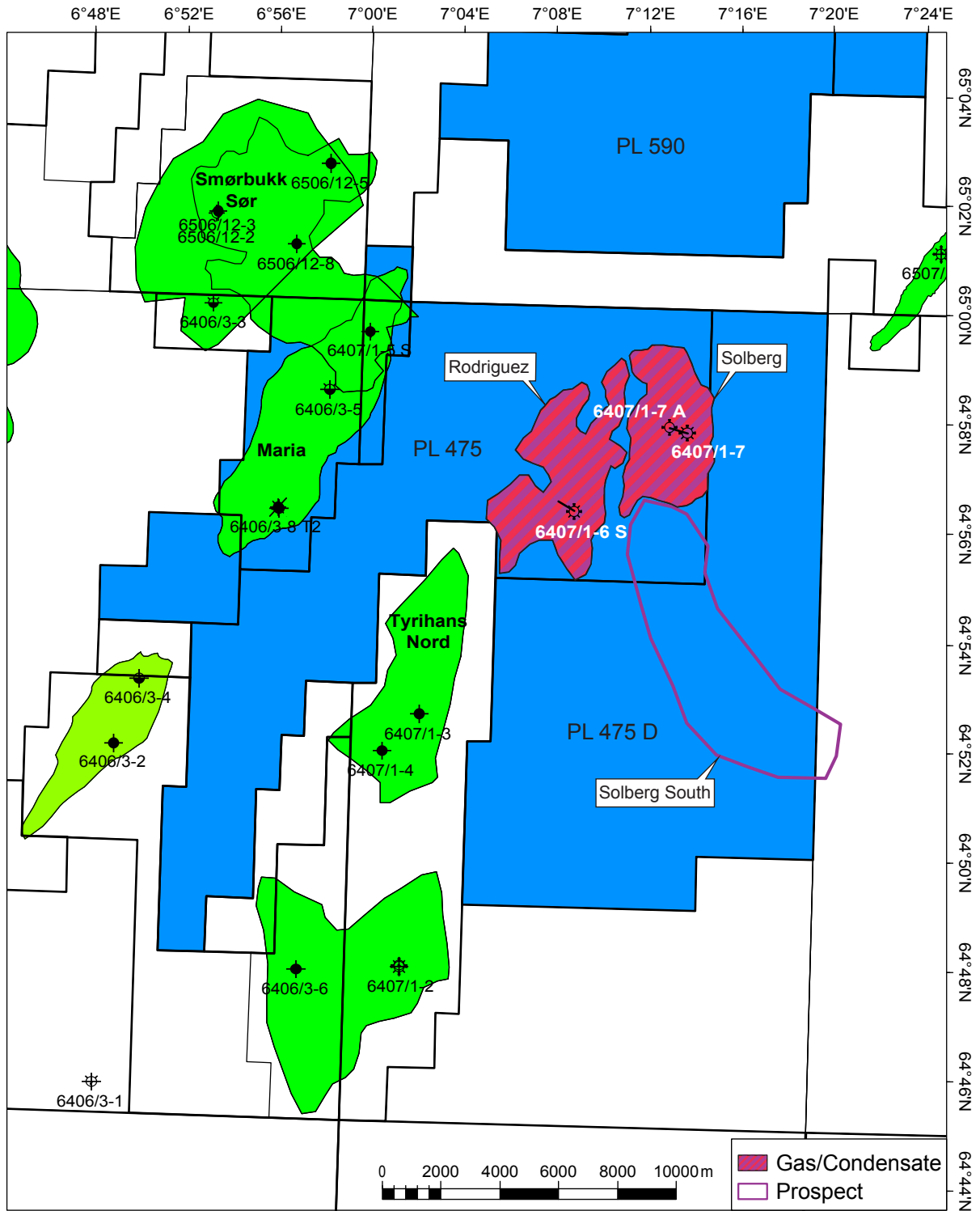


Fig. 1.1 Location Map of PL475 and PL475D

2 Database

As part of the work commitment in PL475, seismic reprocessing was carried out during the period June 2009 to January 2010, by Geotrace on three separate 3D seismic surveys totaling approximately 650 km². The input surveys were ST0614, ST9905 and MWG98. The principal objectives of the reprocessing were to optimize the structural image through improved noise attenuation and elimination of multiple energy, to improve resolution and imaging at top reservoir below the BCU as well as to produce stacks suitable for AVO studies and to achieve a seamless match between the three surveys.

As part of the PL475 G&G activity, seismic interpretation of the re-processed seismic dataset was completed and revised structural maps were generated and utilized for the 6407/1-6 S Rodriguez well placement and post-well evaluation.

The broadband seismic surveys, HVG2013 and PGS14002, was acquired in order to fully evaluate the remaining reserves and upside potential in the area. An AVO analysis, fluid substitution model, wedge model and inversion cube was part of the post well evaluation program.

Well information was available from the nearby Tyrihans Nord, Trestakk and Maria wells and integrated in the seismic interpretation and depth conversion.

A Discovery Evaluation Report, which we refer to for additional details on the Rodriguez and Solberg wells, has been compiled and delivered to NPD in October 2014. (Fig. 2.1)

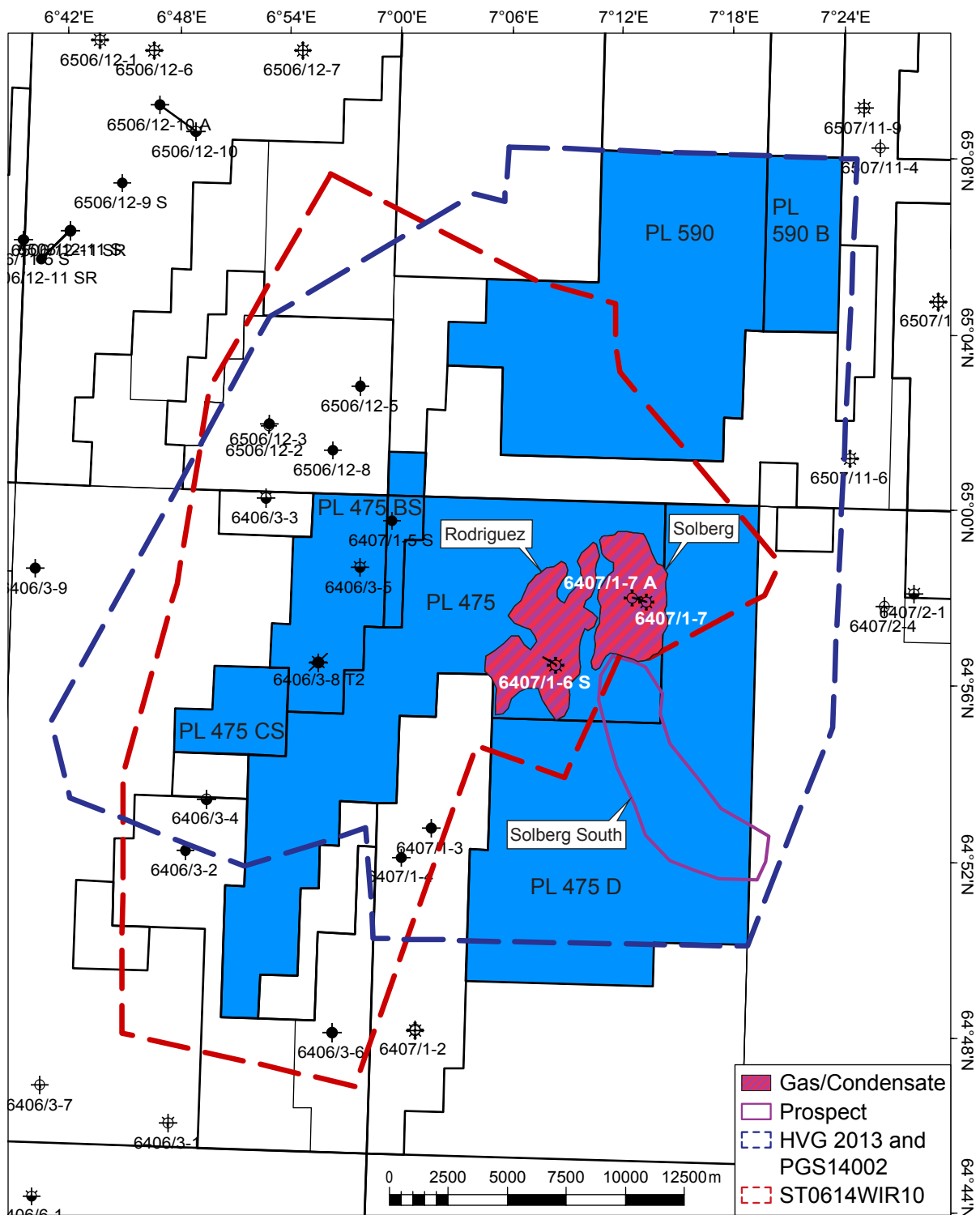


Fig. 2.1 3D seismic Coverage

3 Review of geological framework

Licenses 475 and 475D lies on the southern part of the Halten Terrace of the Norwegian Sea. The present day structure of the Norwegian Sea is interpreted to be the result from five post/Caledonian rift episodes, occurring in the Early-Middle Devonian, Carboniferous, Late Triassic-Early Jurassic, Middle Jurassic-Early Cretaceous and latest Cretaceous-Paleocene (Blystad et al., 1995; Dorè et al., 1999; Gabrielsen et al., 1999; Roberts et al., 1999; Reemst and Cloetingh, 2000; Brekke et al., 2001). The first four episodes relates to intra-continental rifting, whereas the latest Cretaceous-Paleocene rifting represents the continental breakup culminating in seafloor spreading in the North Atlantic and Norwegian Sea from approximately 55 Ma.

The development of the Trøndelag Platform, Halten Terrace and Dønna Terrace as separate structural elements results mainly from Middle Jurassic rifting, although some faults indicate activity also during the Early Cretaceous. The main trap concept on the Halten and Dønna terraces results from the formation of rotated fault blocks during this rift episode. There are indications that the N-S oriented faults were predominantly active during the Late Triassic-Early Jurassic rift episode whereas the Late Jurassic and later extensional phases were primarily associated with NE to SW oriented weakness zones (Færseth et al., 1997). Thermal subsidence also controlled deposition in the Norwegian Sea during the Cretaceous, with increasing deformation caused by sediment loading. Muds of the Lange Formation were laid down in deep-water slope and basinal environments, bounded by shelf deposits on the Norwegian and Greenland margins. The Halten and Dønna terraces were sites of slope channel and fan deposition, with sands derived locally from the Nordland Ridge (Ternan).

The main play in the license area, represented by the Middle Jurassic Garn and Ile Formations and Lower Jurassic Tofte and Tilje Formations, for which the Application was written in 2007, was confirmed to be the most likely case also after seismic interpretation performed during the license G&G work. The main challenge was related to fault seal in what was described as the primary prospects for the application. Fault seal studies showed that the risk was too high for the Santana West and Santana North prospects. The license group agreed to drill the Rodriguez South prospect, later known as Rodriguez. The main targets were the Middle Jurassic Garn and Ile Formations with secondary target in the high amplitudes observed in ST0614WIR10 within the Lange Formation. The Middle Jurassic was water bearing while gas-condensate was proven in thin sandstones within the Lange Formation.

A new perspective on the main prospectivity in the license resulted in a second exploration well and an application for extending the license to the south to cover the remaining potential within the Lange Formation. Both the exploration well 6407/1-7 (Solberg) and the appraisal 6407/1-7 A discovered gas-condensate with a gas down to. The pressure data showed that the Lange Formation sandstones in Rodrigues was not in communication with the sandstones in Solberg. The biostratigraphic report also showed that the sands in 6407/1-6 S was younger than the sands in 6407/1-7 and 6407/1-7 A. In order to fully evaluate the discoveries and remaining reserves in the licensed area, Wintershall purchased 109 and 44km² of the HVG2013 and PGS14002 broadband 3D seismic surveys, respectively.

As part of the G&G studies, seismic interpretation was completed together with revised structural maps. A basin modelling study and fault seal study was performed as part of the well planning phase. A new 3D seismic dataset, HVG2013 and PGS14002, was purchased and seismic modelling and an inversion was conducted as part of the post well analysis. The post well G&G studies includes a full set of Reservoir Studies.

4 Prospect Update

The area applied for in the APA application was partly covered by 3D data, but was located at the edges of the surveys, with a resultant variability in data quality. Several prospects were identified in the area applied for.

Lower-Middle Jurassic downthrown traps within the Grinda Graben

This prospect type includes the Santana West, Santana South and Santana North Prospects. The reservoir target intervals are the Lower-Middle Jurassic Ile and Garn formations. In each case, the traps are downthrown against the bounding faults of the Grinda Graben, such that partial seal is required. The structures lie between 3800-4000m depth, and the anticipated fluid phase is light oil. In order to de-risk the prospects a fault seal study was conducted. The result was that the risk increased significantly for all the prospects.

Lower-Middle Jurassic fault seal prospects to the east of the Grinda Graben

Comprising the Rodriguez prospect and Carabello prospect, these structures describe fault-bounded traps, all with a downthrown element. The prospects lie at depths of 3200-3500m. The reservoir interval is locally uncertain, but could comprise any combination of Garn Formation, Ile Formation and/or Tilje Formation. Interpretation of the ST0614WIR10 3D seismic survey increased the risk of Carabello due to high degree of reservoir compartmentalization and decrease in volume. One of the major risks for the Rodriguez prospect was charge and retention. Basin modelling studies showed that the surrounding Spekk and Melke formations had the capability of expelling enough hydrocarbons to fill the structure. In addition, interpretation of the re-processed ST0614WIR10 decreased the risk of the retention capability of the fault in the north. Hence, the firm exploration well, 6407/1-6 S, targeted the Middle Jurassic Rodriguez prospect with secondary target in the high amplitudes in the Lange Formation.

Upper Jurassic structural-stratigraphic traps

Two prospects have been identified at Upper Jurassic level within the Grinda Graben (Carlos West and Carlos North). The prospectivity is based on postulated Upper Jurassic Rogn Formation sandstones encased within the Spekk Formation. Rogn Formation sandstones have not been encountered by offset wells, and the depositional model indicating their presence in the Grinda Graben is based on the apparent erosion of Garn-Ile formations in adjacent areas. However, the risk of finding large enough volumes to support a well was considered too high.

The Middle Jurassic target in 6407/1-6 S was dry; however, gas-condensate was discovered in thin sandstones of the Lange Formation at the same level as the observed high amplitudes. Post well evaluation including AVO analysis, wedge modelling and fluid substitution, resulted in the planning of a second exploration well. The analysis showed potential for finding thick hydrocarbon filled sandstones approximately 5 km east of Rodriguez in the Solberg Prospect. Exploration well 6407/1-7 was drilled the following year and found gas-condensate in thicker sandstones in the Lange Formation. A sidetrack was drilled in order to get a better understanding of the correlation between the observed amplitudes and well data. In order to understand the reserve potential within the Lange Formation in the area, new 3D seismic broadband was acquired (HVG2013 and PGS14002) and seismic modelling and an inversion on those data was performed.

Through interpretation of the new seismic dataset a new prospect (Solberg South) was observed in PL475 D. Solberg South is the southern continuation of the high amplitudes within the Lange Formation that constitutes the Solberg and Rodriguez discoveries. This prospect was included in the economical evaluation of the potential in the area. (Fig. 4.1, Fig. 4.2, Fig. 4.3)

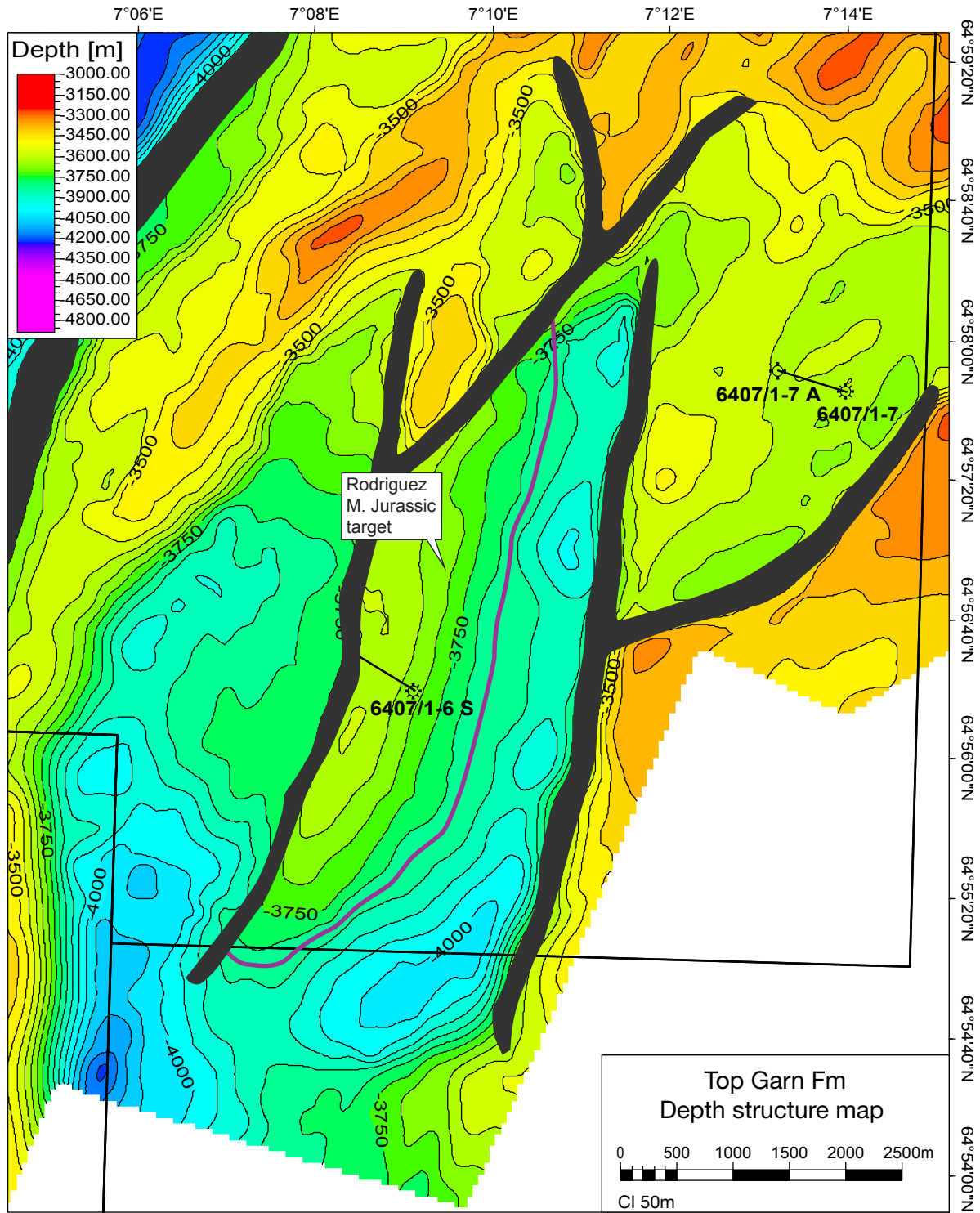


Fig. 4.1 Top Garn Formation Depth Structure Map
Top Garn Formation with outline of original Middle Jurassic target in Rodriguez shown in purple.

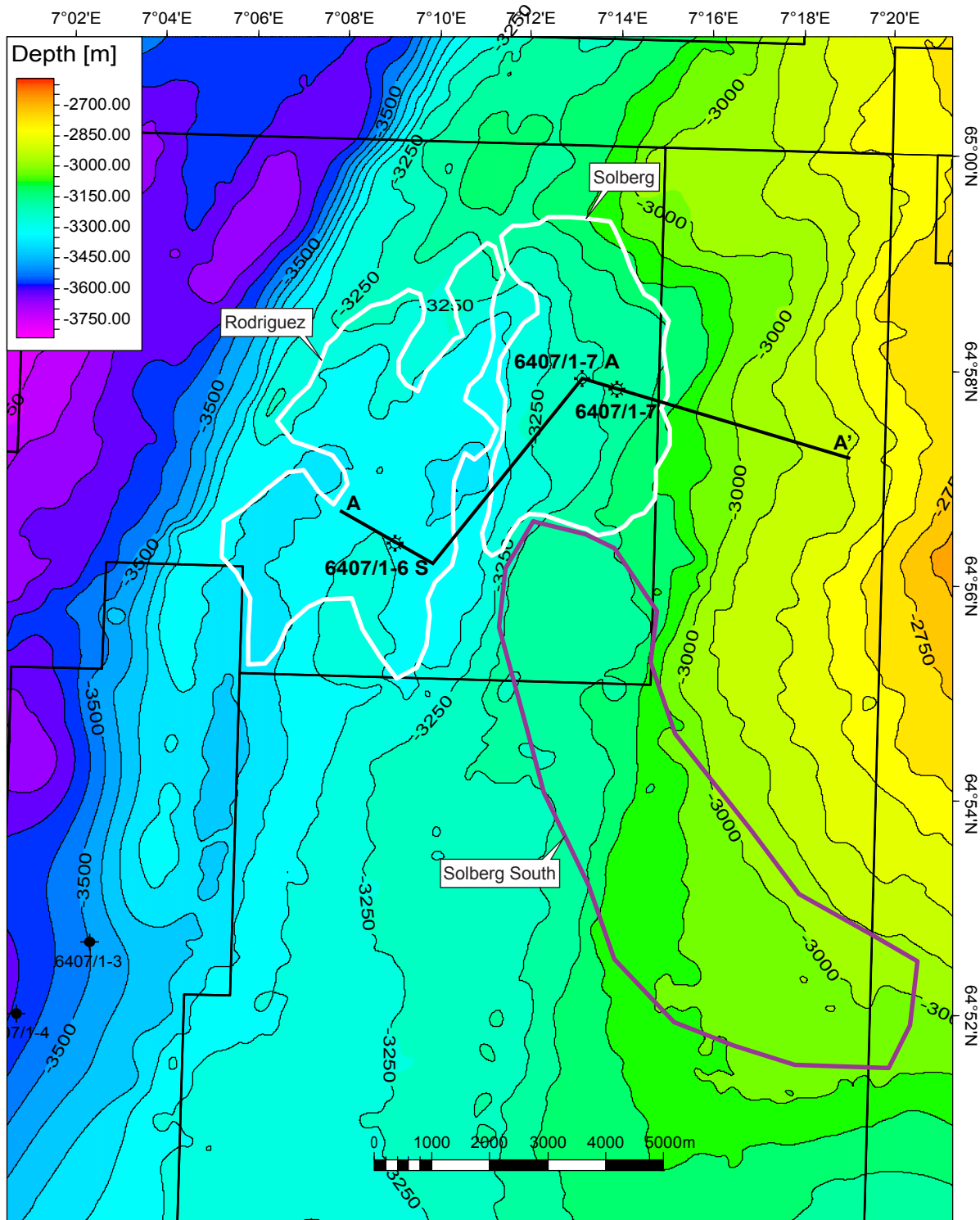


Fig. 4.2 Base Intra Lange Sandstone Depth Structure Map

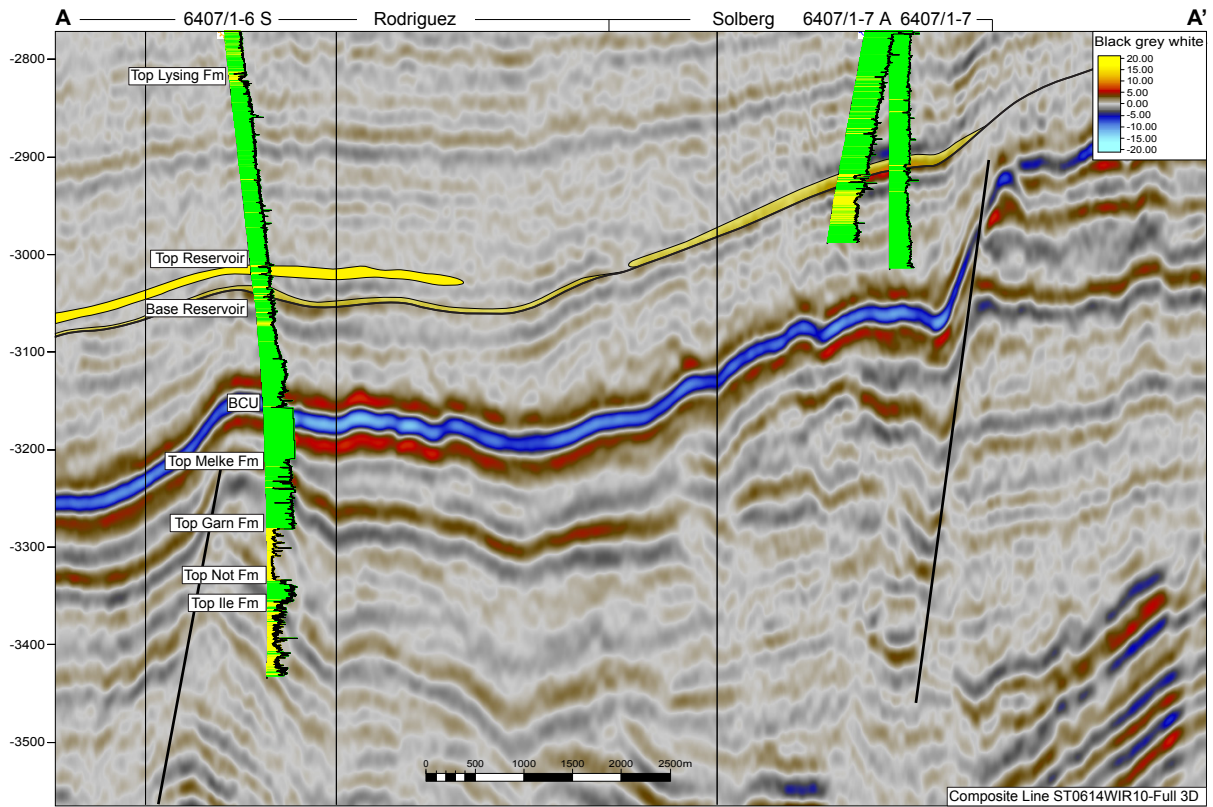


Fig. 4.3 Seismic Composite Line through Rodriguez and Solberg

5 Technical evaluations

The two discoveries Solberg and Rodriguez have a technical P50 contingent resource of 7,8 and 7, 7 mmboe, respectively. The gas volumes are located in thin sands across a wide area that are, according to pressure measurements, compartmentalized. Development cost are sensitive to the number of wells needed to drain the thin sands. The development solution consists of a 4 slot template with tie-back to the Kristin facility. Two producers are required to drain the P90 and P50 volumes, whereas four producers are required to drain the P10 volumes. The EPOS and discovered volumes are too low to warrant a development.

PL475D has a prospect in Lange Formation called Solberg South with a P50 technical volume of 7,9 mmboe and GPOS of 31,5%. The development of Solberg and Rodriguez together with Solberg South is deemed uncommercial.

6 Conclusions

In summary, the remaining prospectivity in PL475 and PL475 D shows a potential in the discoveries and additional prospectivity within the intra Lange sandstones. The licenses were extended by one year from 28th of February 2015, in order to fully evaluate the discoveries made by the two exploration wells and the sidetrack. Eventually the discoveries are considered uncommercial. Wintershall Norge AS technical recommendation to PL475 and PL475D JV was to proceed with the relinquishment of the License. Such recommendation has been accepted unanimously by all partners.

7 References

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