

# Relinquishment report

PL487S

28.04.2010



# Drill or Drop decision – PL 487S

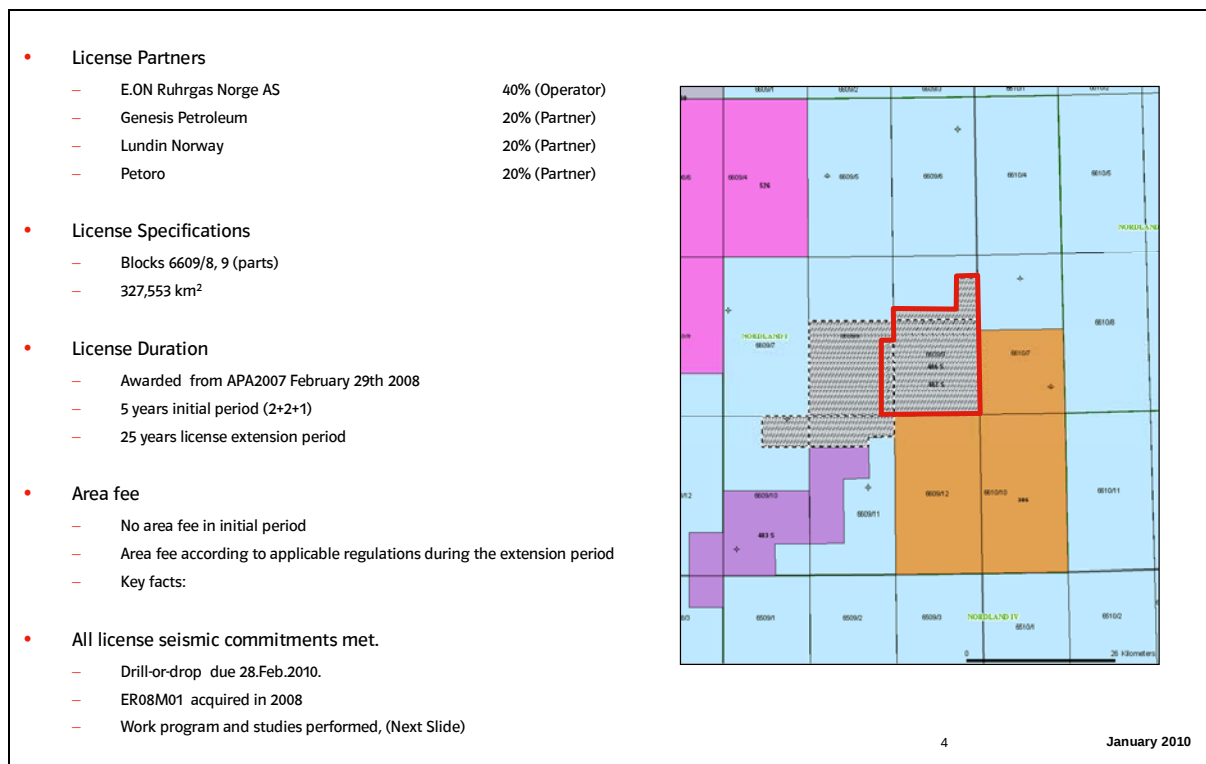
## PL 487S Recommendation

The evaluation of PL487S shows that licence has one prospect, Gøll. The GCF for the prospect is 9,6 %. The key risk factors are geometry and HC source. The P50 recoverable resources is 15,5 MSm<sup>3</sup> oe (gas case). A technical/economical evaluation, Swansons mean, has been performed on the Gøll Prospect giving a positive EMV of 6,4MNOK. ERN recommended the license group to apply for an extension for the licence, to complete a PSDM, in order to lower the geometry risk. The partners did not agree to this.

**As the volumes are medium size, combined with a low GCF, PL487S drop the license in end of February 2010.**

## Licence overview and work-commitment

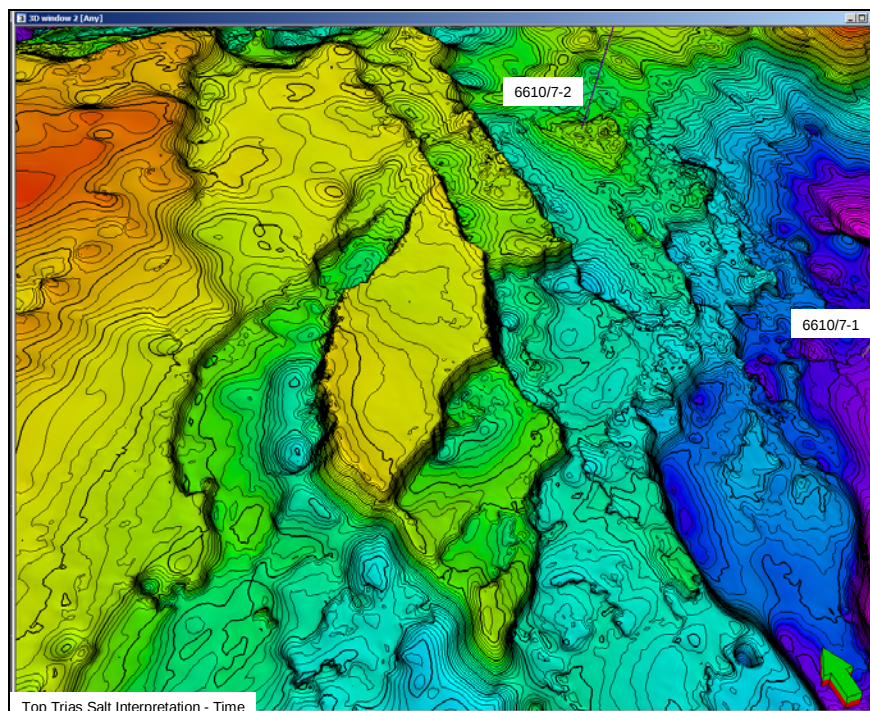
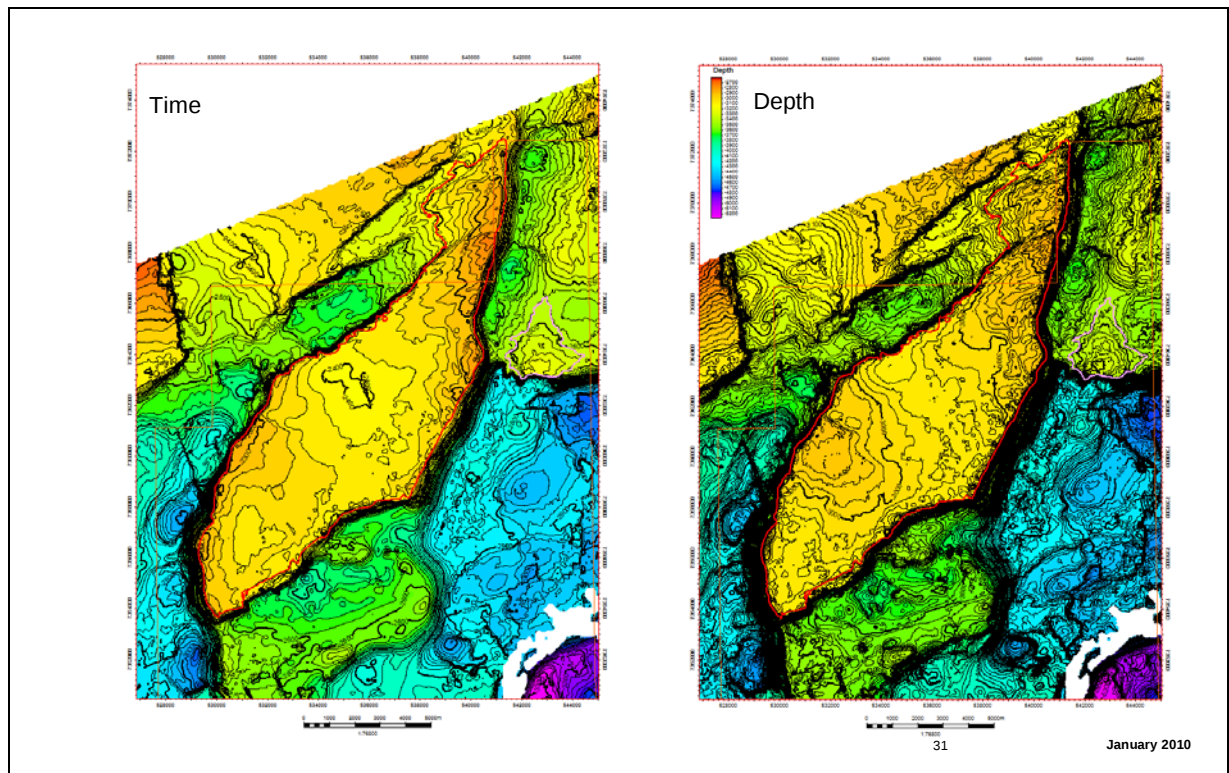
The licence was awarded in APA 2002 with a 5(2+2+1) years initial period. The license lies in the outlined area, with E.On-Ruhrgas as the operator, Petoro, Genesis Petroleum and Lundin Norway as partners. The license commitments were seismic acquisition, ER0802 was acquired in 2008. In addition a lot of G&G studies have been done. All license commitments are met.



## Location, structural setting and reservoirs

PL 487S is located on eastern margin of the Nordland Ridge, just entering the Helgeland Basin. The structure is a horst block with a saddle point in the middle, which separates the

P90 and P50 volumes to two segments. The P10 case is filled below the saddle point. Reservoir is Triassic sub salt sands of Ladinian-Anisian age. Top seal is provided by the thick Triassic Ladinian salt.



- Horst block – at top Salt Level. Easy to map. In detail the situation is different. In the North eastern corner there is a seismic imaging problem. A fault shadow and the inversion of this fault makes the imaging hard.
- The Western part of Gøll is better imaged and there is no/little inversion along these faults.
- Interpreting is done on the salt layer – the reservoir (sand) is not a continuous reflector.

### Structure

- Fault block, Horst

### Reservoir

- Ladinian sandstone,
- No support from seismic interpretation – sand response is masked by salt side lobes.

### Seal

- Salt – thick salt over Gøll – continuous reflectors – thicker in West.
- fault seal required

### Charge

- Most likely gas – from Ravnefjeld/Perm/Triassic
- Oil is possible from Spekk source

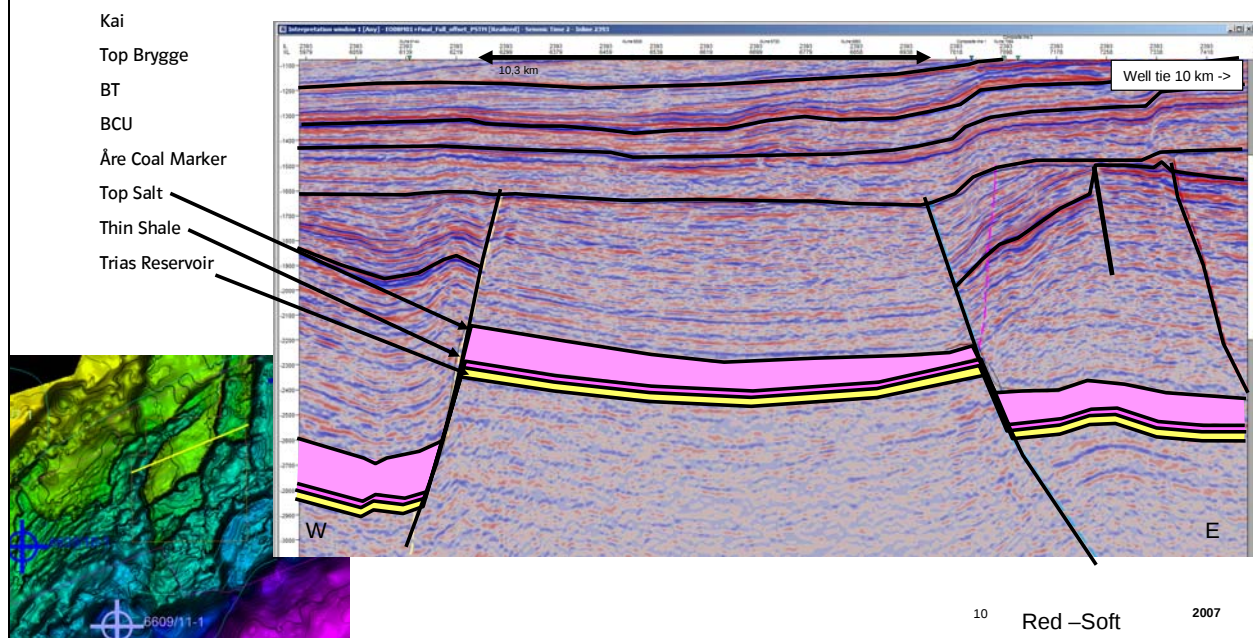
### Biggest risks

- Fault seal: active fault seal required, Eastern boundary fault is inverted.
- Charge
- Geometry poorly defined in NE corner

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January 2010

### Seismic line crossing Gøll – Salt, Shale and reservoir outlined



### Prospects description, volumes and risking

The **Gøll prospect** is a structural trap on a horst block, with potential reservoir at Ladinian - Anisian level. It is limited by faults in all directions. Due to seismic imaging quality, the



north-eastern corner is poorly defined. P10 spill point is located in the north-eastern corner of the horst block.

Few data point from Triassic reservoirs, and no Triassic Fields. The two nearby wells have sand at same age, but at deeper level.

The volume-calculations are based on volume – depth curves from Petrel. The HC contacts used are a small 3-way closure for the P90, and P10 has been estimated by setting P01 at spill point. N/G and porosity input from nearby wells have been correlated to the depth for the Gøll prospect. The overall GCF is calculated to be 9,6% with a P50 potential recoverable resource of 15,5 MSm<sup>3</sup> oe (gas case).

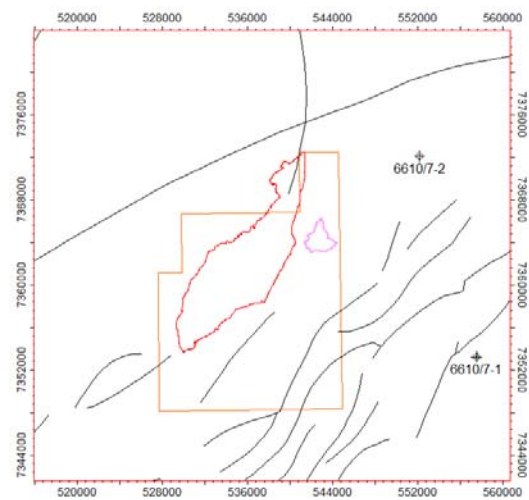
Triassic Prospect:

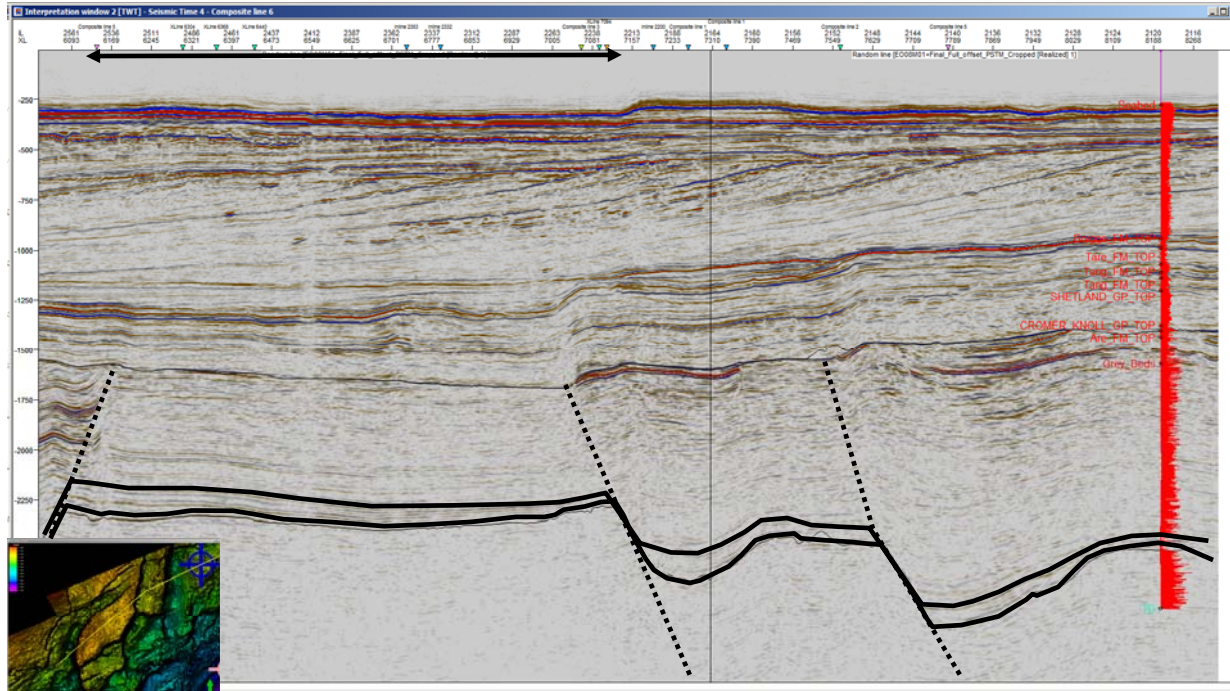
- **Gøll - Red** - Sub Salt Triassic (Landinian) Sandstone - The whole horst block - filled down to spill point in NE corner. GCF XX P50 recoverable mmboe.

Triassic Lead:

- **Lille Gøll - Pink** - downthrown fault block - lead

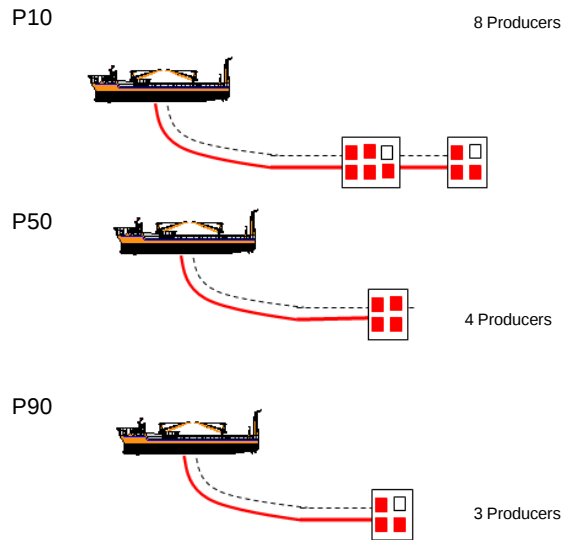
Of these Gøll will be shown in detail.





**Sub sea development:**

- Prospect is located in an undeveloped area of the Norwegian Sea
- One or two templates with 4 or 6 slots
- Tied back to Norne facilities, 85 km
- Challenging distance, hydrate inhibition may be required.
- Further benefit can be gained if an existing riser can be used, or there is a subsea production tie-in point that is fit for purpose
- Risks related to flow assurance, seabed conditions and facilities at Norne

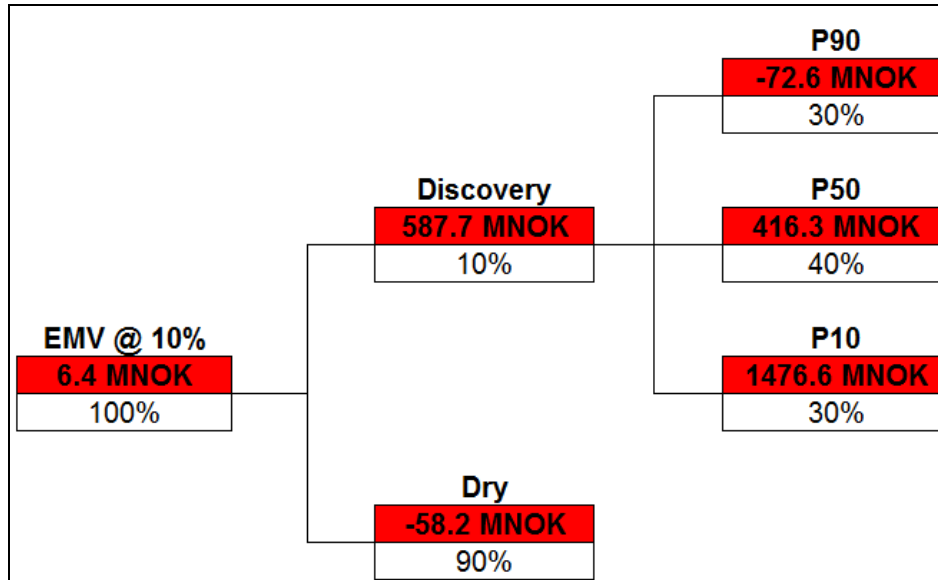


**Technical/economical evaluation of the Gøll Prospect**

The development is assumed to be a simple template (water-depth 244 m), production and umbilical tied back to the Norne Field located 85km to the SW. Such a long tieback to Norne would be challenging with regards to flow assurance due to the distance and cold temperatures. Modifications would be required on Norne in order to provide the necessary chemicals or other means of hydrate mitigation. There is a risk that technology qualifications would be required on new equipment or technology.

For economic calculations it is assumed that an exploration well is drilled in 2012 followed shortly by an appraisal well. Production start is planned to be in 2018. General oil/gas price assumptions have been used. Discount rate is set to 10%, and tariffs for gas is 28,4 øre/m<sup>3</sup>.

Using Swanson's Mean (P90, P50 and P10) gives a positive EMV (6,4MNOK) with a IRR of 10%.



## Conclusion and recommendation

The evaluation of PL487S shows that licence has several small prospects.

- GCF 9,6%
  - Key risk factors are geometry and HC source.
- P50 recoverable resources (gas case) 15,5 Mm<sup>3</sup> oe.
- Positive economics – EMV (6,4 MNOK) with at IRR of 10%