

**General information**

|                                    |                                            |
|------------------------------------|--------------------------------------------|
| Wellbore name                      | 25/8-10 S                                  |
| Type                               | EXPLORATION                                |
| Purpose                            | WILDCAT                                    |
| Status                             | P&A                                        |
| Factmaps in new window             | <a href="#">link to map</a>                |
| Main area                          | NORTH SEA                                  |
| Field                              | <a href="#">BALDER</a>                     |
| Discovery                          | <a href="#">25/8-10 S Ringhorne</a>        |
| Well name                          | 25/8-10                                    |
| Seismic location                   | ESD96-3 & SP 577                           |
| Production licence                 | <a href="#">027</a>                        |
| Drilling operator                  | Esso Exploration and Production Norway A/S |
| Drill permit                       | 883-L                                      |
| Drilling facility                  | <a href="#">DEEPSEA TRYM</a>               |
| Drilling days                      | 37                                         |
| Entered date                       | 29.04.1997                                 |
| Completed date                     | 05.06.1997                                 |
| Release date                       | 05.06.1999                                 |
| Publication date                   | 29.08.2003                                 |
| Purpose - planned                  | WILDCAT                                    |
| Reentry                            | NO                                         |
| Content                            | OIL                                        |
| Discovery wellbore                 | YES                                        |
| 1st level with HC, age             | PALEOCENE                                  |
| 1st level with HC, formation       | HERMOD FM                                  |
| 2nd level with HC, age             | PALEOCENE                                  |
| 2nd level with HC, formation       | HEIMDAL FM                                 |
| Kelly bushing elevation [m]        | 25.0                                       |
| Water depth [m]                    | 129.0                                      |
| Total depth (MD) [m RKB]           | 1890.0                                     |
| Final vertical depth (TVD) [m RKB] | 1883.9                                     |
| Maximum inclination [°]            | 10.4                                       |
| Bottom hole temperature [°C]       | 83                                         |
| Oldest penetrated age              | PALEOCENE                                  |
| Oldest penetrated formation        | EKOFISK FM                                 |
| Geodetic datum                     | ED50                                       |
| NS degrees                         | 59° 16' 22.69" N                           |



|                |               |
|----------------|---------------|
| EW degrees     | 2° 32' 6.4" E |
| NS UTM [m]     | 6570692.44    |
| EW UTM [m]     | 473501.58     |
| UTM zone       | 31            |
| NPDID wellbore | 3062          |

## Wellbore history

### General

Well 25/8-10 S is located north of the Grane Field. The well was drilled and tested to obtain representative fluid samples, production characteristics, and reservoir permeabilities in the Forseti Prospect in the Hermod - Middle Heimdal formation.

### Operations and results

Exploration well 25/8-10 S was spudded with semi-submersible drilling installation "Deepsea Trym" on 29 April 1997 and drilled to TD at 1749.5 m in the Late Paleocene Lista Formation. The original 25/8-10 S well was drilled with a slightly deviated profile (+/- 6 degree maximum angle) to a depth of 1749 m MD RKB. Due to a mechanical problem, which occurred after coring at 1722-1749 m, the well was plugged back and a technical sidetrack (25/8-10S T2) was kicked off at 1076 m and drilled to the original geologic objective at a total depth of 1890 m in the Early Paleocene Ekofisk Formation. Well 25/8-10 S was drilled with seawater and bentonite sweeps down to 1091 m and with oil based "Ancovert" mud from 1091 m to TD. The technical sidetrack 25/810 S T2 was drilled with oil based with "Ancovert" mud. The sidetrack penetrated 18 m (net pay) of oil filled sand in the Hermod - Middle Heimdal formation with an OWC, based on logs, at 1755.5 m TVD SS. The pay zone consisted of three sand intervals. One core was cut in the 25/8-10 S wellbore in the interval 1722 m to 1749.65 m (Sele, Hermod, and Lista Formations). A second core was cut in the 25/8-10 S T2 sidetrack in the interval 1749 m to 1786 m. (Lista and Heimdal Formations). After wire line logging the 25/8-10S T2 well a drill stem test of the upper sand interval, in the Hermod Formation, was performed. Fluid samples were taken during the DST. The well was permanently abandoned on 5 June 1997 as an oil and gas discovery, named the 25/8-10 S Ringhorne Discovery.

### Testing

The interval from 1727.0 m to 1740.5 m (1698.6 - 1711.9 m TVD SS) in the Hermod Formation was perforated. The test showed an unconsolidated reservoir with high porosity. The GOR at rate 445 Sm<sup>3</sup>/day increased roughly from 45 Sm<sup>3</sup>/Sm<sup>3</sup> to 90 Sm<sup>3</sup>/Sm<sup>3</sup> as the wellhead pressure increased from 600 to 800 psia. This was considered consistent with the presence of a gas cap.

## Cuttings at the Norwegian Offshore Directorate

|                               |                                   |
|-------------------------------|-----------------------------------|
| Cutting sample, top depth [m] | Cutting samples, bottom depth [m] |
| 1100.00                       | 1890.00                           |

|                                  |     |
|----------------------------------|-----|
| Cuttings available for sampling? | YES |
|----------------------------------|-----|



### Cores at the Norwegian Offshore Directorate

| Core sample number | Core sample - top depth | Core sample - bottom depth | Core sample depth - uom |
|--------------------|-------------------------|----------------------------|-------------------------|
| 1                  | 1722.0                  | 1749.7                     | [m ]                    |
| 2                  | 1749.0                  | 1786.0                     | [m ]                    |

|                               |      |
|-------------------------------|------|
| Total core sample length [m]  | 64.7 |
| Cores available for sampling? | YES  |

### Core photos



1749-1754m



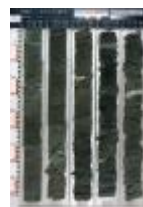
1754-1759m



1759-1764m



1764-1769m



1769-1774m



1774-1779m



1779-1784m



1784-1786m

### Palynological slides at the Norwegian Offshore Directorate

| Sample depth | Depth unit | Sample type | Laboratory |
|--------------|------------|-------------|------------|
| 1110.0       | [m]        | DC          | CGG        |
| 1130.0       | [m]        | DC          | CGG        |
| 1150.0       | [m]        | DC          | CGG        |
| 1160.0       | [m]        | DC          | CGG        |
| 1170.0       | [m]        | DC          | CGG        |
| 1190.0       | [m]        | DC          | CGG        |
| 1200.0       | [m]        | DC          | CGG        |
| 1220.0       | [m]        | DC          | CGG        |
| 1230.0       | [m]        | DC          | CGG        |
| 1240.0       | [m]        | DC          | CGG        |



|        |     |    |     |
|--------|-----|----|-----|
| 1250.0 | [m] | DC | CGG |
| 1260.0 | [m] | DC | CGG |
| 1270.0 | [m] | DC | CGG |
| 1280.0 | [m] | DC | CGG |
| 1290.0 | [m] | DC | CGG |
| 1300.0 | [m] | DC | CGG |
| 1310.0 | [m] | DC | CGG |
| 1320.0 | [m] | DC | CGG |
| 1330.0 | [m] | DC | CGG |
| 1340.0 | [m] | DC | CGG |
| 1350.0 | [m] | DC | CGG |
| 1360.0 | [m] | DC | CGG |
| 1370.0 | [m] | DC | CGG |
| 1380.0 | [m] | DC | CGG |
| 1390.0 | [m] | DC | CGG |
| 1410.0 | [m] | DC | CGG |
| 1420.0 | [m] | DC | CGG |
| 1430.0 | [m] | DC | CGG |
| 1440.0 | [m] | DC | CGG |
| 1460.0 | [m] | DC | CGG |
| 1470.0 | [m] | DC | CGG |
| 1480.0 | [m] | DC | CGG |
| 1500.0 | [m] | DC | CGG |
| 1510.0 | [m] | DC | CGG |
| 1520.0 | [m] | DC | CGG |
| 1530.0 | [m] | DC | CGG |
| 1540.0 | [m] | DC | CGG |
| 1560.0 | [m] | DC | CGG |
| 1570.0 | [m] | DC | CGG |
| 1580.0 | [m] | DC | CGG |
| 1590.0 | [m] | DC | CGG |
| 1600.0 | [m] | DC | CGG |
| 1612.0 | [m] | DC | CGG |
| 1618.0 | [m] | DC | CGG |
| 1624.0 | [m] | DC | CGG |
| 1630.0 | [m] | DC | CGG |
| 1636.0 | [m] | DC | CGG |
| 1642.0 | [m] | DC | CGG |
| 1648.0 | [m] | DC | CGG |
| 1654.0 | [m] | DC | CGG |



|            |    |     |
|------------|----|-----|
| 1660.0 [m] | DC | CGG |
| 1662.0 [m] | DC | CGG |
| 1672.0 [m] | DC | CGG |
| 1684.0 [m] | DC | CGG |
| 1690.0 [m] | DC | CGG |
| 1702.0 [m] | DC | CGG |
| 1705.0 [m] | DC | CGG |
| 1711.0 [m] | DC | CGG |
| 1717.0 [m] | DC | CGG |
| 1722.7 [m] | C  | CGG |
| 1723.0 [m] | C  | CGG |
| 1725.8 [m] | C  | CGG |
| 1726.0 [m] | C  | CGG |
| 1727.0 [m] | C  | CGG |
| 1728.1 [m] | C  | CGG |
| 1729.0 [m] | C  | CGG |
| 1730.0 [m] | C  | CGG |
| 1731.4 [m] | C  | CGG |
| 1732.0 [m] | C  | CGG |
| 1733.7 [m] | C  | CGG |
| 1735.0 [m] | C  | CGG |
| 1735.5 [m] | C  | CGG |
| 1738.0 [m] | C  | CGG |
| 1738.3 [m] | C  | CGG |
| 1739.0 [m] | C  | CGG |
| 1741.0 [m] | C  | CGG |
| 1744.0 [m] | C  | CGG |
| 1747.0 [m] | C  | CGG |
| 1750.0 [m] | C  | CGG |
| 1753.0 [m] | C  | CGG |
| 1756.0 [m] | C  | CGG |
| 1759.0 [m] | C  | CGG |
| 1761.0 [m] | C  | CGG |
| 1765.0 [m] | C  | CGG |
| 1768.0 [m] | C  | CGG |
| 1771.0 [m] | C  | CGG |
| 1774.0 [m] | C  | CGG |
| 1777.0 [m] | C  | CGG |
| 1778.0 [m] | C  | CGG |
| 1779.0 [m] | C  | CGG |



|            |   |     |
|------------|---|-----|
| 1780.9 [m] | C | CGG |
|------------|---|-----|

**Oil samples at the Norwegian Offshore Directorate**

| Test type | Bottle number | Top depth MD [m] | Bottom depth MD [m] | Fluid type | Test time | Samples available |
|-----------|---------------|------------------|---------------------|------------|-----------|-------------------|
| FMT       |               | 0.00             | 0.00                |            |           | YES               |
| MDT       |               | 0.00             | 0.00                |            |           | YES               |

**Lithostratigraphy**

| Top depth [mMD RKB] | Lithostrat. unit               |
|---------------------|--------------------------------|
| 154                 | <a href="#">NORDLAND GP</a>    |
| 629                 | <a href="#">UTSIRA FM</a>      |
| 692                 | <a href="#">NO FORMAL NAME</a> |
| 757                 | <a href="#">HORDALAND GP</a>   |
| 757                 | <a href="#">SKADE FM</a>       |
| 900                 | <a href="#">NO FORMAL NAME</a> |
| 910                 | <a href="#">SKADE FM</a>       |
| 1100                | <a href="#">NO FORMAL NAME</a> |
| 1645                | <a href="#">ROGALAND GP</a>    |
| 1645                | <a href="#">BALDER FM</a>      |
| 1708                | <a href="#">SELE FM</a>        |
| 1725                | <a href="#">HERMOD FM</a>      |
| 1741                | <a href="#">LISTA FM</a>       |
| 1761                | <a href="#">HEIMDAL FM</a>     |
| 1765                | <a href="#">LISTA FM</a>       |
| 1777                | <a href="#">HEIMDAL FM</a>     |
| 1827                | <a href="#">SHETLAND GP</a>    |
| 1827                | <a href="#">EKOFISK FM</a>     |

**Composite logs**

| Document name        | Document format | Document size [MB] |
|----------------------|-----------------|--------------------|
| <a href="#">3062</a> | pdf             | 0.28               |



**Documents - reported by the production licence (period for duty of secrecy expired)**

| Document name                                    | Document format | Document size [MB] |
|--------------------------------------------------|-----------------|--------------------|
| <a href="#">3062_25_8_10_S_COMPLETION_REPORT</a> | pdf             | 87.99              |

**Drill stem tests (DST)**

| Test number | From depth MD [m] | To depth MD [m] | Choke size [mm] |
|-------------|-------------------|-----------------|-----------------|
| 1.0         | 1727              | 1740            | 14.4            |

| Test number | Final shut-in pressure [MPa] | Final flow pressure [MPa] | Bottom hole pressure [MPa] | Downhole temperature [°C] |
|-------------|------------------------------|---------------------------|----------------------------|---------------------------|
| 1.0         | 4.000                        | 4.000                     | 4.000                      | 70                        |

| Test number | Oil [Sm3/day] | Gas [Sm3/day] | Oil density [g/cm3] | Gas grav. rel.air | GOR [m3/m3] |
|-------------|---------------|---------------|---------------------|-------------------|-------------|
| 1.0         | 413           | 15            | 0.900               | 0.680             |             |

**Logs**

| Log type         | Log top depth [m] | Log bottom depth [m] |
|------------------|-------------------|----------------------|
| MWD - GR RES DIR | 228               | 1086                 |
| MWD - GR RES DIR | 1076              | 1707                 |

**Casing and leak-off tests**

| Casing type | Casing diam. [inch] | Casing depth [m] | Hole diam. [inch] | Hole depth [m] | LOT/FIT mud eqv. [g/cm3] | Formation test type |
|-------------|---------------------|------------------|-------------------|----------------|--------------------------|---------------------|
| CONDUCTOR   | 30                  | 227.0            | 36                | 228.0          | 0.00                     | LOT                 |
| SURF.COND.  | 13 3/8              | 1076.0           | 17 1/2            | 1091.0         | 0.00                     | LOT                 |
| OPEN HOLE   |                     | 1890.0           | 8 1/2             | 1890.0         | 0.00                     | LOT                 |

**Drilling mud**





| Depth<br>MD [m] | Mud<br>weight<br>[g/cm3] | Visc.<br>[mPa.s] | Yield point<br>[Pa] | Mud type      | Date<br>measured |
|-----------------|--------------------------|------------------|---------------------|---------------|------------------|
| 228             | 1.03                     |                  |                     | SPUD MUD      |                  |
| 890             | 1.32                     | 31.0             |                     | OIL (REGULAR) |                  |
| 1000            | 1.06                     |                  |                     | SPUD MUD      |                  |
| 1050            | 1.32                     | 32.0             |                     | OIL (REGULAR) |                  |
| 1091            | 1.43                     | 60.0             |                     | LO-TOX OBM    |                  |
| 1150            | 1.32                     | 28.0             |                     | LO-TOX OBM    |                  |
| 1244            | 1.32                     | 26.0             |                     | LO-TOX OBM    |                  |
| 1518            | 1.32                     | 28.0             |                     | LO-TOX OBM    |                  |
| 1751            | 1.32                     | 29.0             |                     | LO-TOX OBM    |                  |
| 1786            | 1.32                     | 30.0             |                     | LO-TOX OBM    |                  |
| 1890            | 1.32                     | 30.0             |                     | OIL (REGULAR) |                  |

### Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

| Document name                                             | Document<br>format | Document size<br>[MB] |
|-----------------------------------------------------------|--------------------|-----------------------|
| <a href="#">3062 Formation pressure (Formasjonstrykk)</a> | pdf                | 0.19                  |

