



## Generell informasjon

|                                          |                                         |
|------------------------------------------|-----------------------------------------|
| Brønnbane navn                           | 34/4-16 S                               |
| Type                                     | EXPLORATION                             |
| Formål                                   | APPRAISAL                               |
| Status                                   | PLUGGED                                 |
| Pressemelding                            | <a href="#">lenke til pressemelding</a> |
| Faktakart i nytt vindu                   | <a href="#">lenke til kart</a>          |
| Hovedområde                              | NORTH SEA                               |
| Funn                                     | <a href="#">34/4-15 S (Dugong)</a>      |
| Brønn navn                               | 34/4-16                                 |
| Seismisk lokalisering                    | CGG17M01VNGR18 Inline 3571. xline 31640 |
| Utvinningstillatelse                     | <a href="#">882</a>                     |
| Boreoperatør                             | Neptune Energy Norge AS                 |
| Boretillatelse                           | 1846-L                                  |
| Boreinnretning                           | <a href="#">DEEPSEA YANTAI</a>          |
| Boredager                                | 33                                      |
| Borestart                                | 27.02.2021                              |
| Boreslutt                                | 31.03.2021                              |
| Plugget dato                             | 23.09.2021                              |
| Frigitt dato                             | 31.03.2023                              |
| Publiseringsdato                         | 12.09.2023                              |
| Opprinnelig formål                       | APPRAISAL                               |
| Gjenåpnet                                | NO                                      |
| Innhold                                  | OIL                                     |
| Funnbrønnbane                            | NO                                      |
| 1. nivå med hydrokarboner, alder         | MIDDLE JURASSIC                         |
| 1. nivå med hydrokarboner, formasjon.    | BRENT GP                                |
| Avstand, boredekk - midlere havflate [m] | 27.3                                    |
| Vanndybde ved midlere havflate [m]       | 331.0                                   |
| Totalt målt dybde (MD) [m RKB]           | 3603.0                                  |
| Totalt vertikalt dybde (TVD) [m RKB]     | 3583.0                                  |
| Maks inklinasjon [°]                     | 13.8                                    |
| Temperatur ved bunn av brønnbanen [°C]   | 123                                     |
| Eldste penetrerte alder                  | EARLY JURASSIC                          |
| Eldste penetrerte formasjon              | DRAKE FM                                |



|                      |                  |
|----------------------|------------------|
| Geodetisk datum      | ED50             |
| NS grader            | 61° 33' 42.58" N |
| ØV grader            | 2° 2' 10.59" E   |
| NS UTM [m]           | 6825910.62       |
| ØV UTM [m]           | 448798.01        |
| UTM sone             | 31               |
| NPDID for brønnbanen | 9242             |

## Brønnhistorie

### General

Well 34/4-16 S was drilled to appraise the 34/4-15 S Dugong discovery in the boarder between the Marulk Basin and Tampen Spur in the North Sea. The primary objective was to prove commercial hydrocarbons in the Middle Jurassic Rannoch Formation, locate the Oil-Water Contact and perform a Drill Stem Test if sufficient oil column.

### Operations and results

Appraisal well 34/4-16 S was spudded with the semi-submersible installation Deepsea Yantai on 27 February 2021 and drilled to TD at 3603 m (3583 m TVD) m in the Early-Middle Jurassic Drake Formation. The well was drilled S-shaped with vertical sections above ca 1825 m and below ca 3010 m. Operations proceeded without significant problems. The well was drilled with Glydril mud, seawater and hi-vis sweeps down to 1207 m, with Versatec oil-based mud from 1207 m to 3334 m, and with Rheguard oil-based mud from 3334 m TD.

Brent Group sandstones were penetrated at 3457 m (3437 m TVD): The Brent Group includes an 11 m thick Tarbert Fm sandstone on top and Rannoch Formation sandstones below down to top Drake Formation at 3553 m (3532.6 m TVD) Both Tarbert and Rannoch were found oil-bearing. The upper Tarbert oil column gradient lie on a ca 1 bar higher pressured gradient than the Rannoch oil column. Moveable hydrocarbons was seen down to 3489 m (3469 m TVD)

The only shows above OBM was in the oil-bearing Brent Group.

Two cores were cut in succession over the Heather-Tarbert-Rannoch sequence from 3449 to 3503.8 m. Fluid samples were taken at 3476.2 m (oil) and 3497.4 m (water).

The well was suspended on 31 March 2021 and then re-entered on 1 September same year for testing. Deepsea Yantai was used both for drilling and testing. The well was permanently abandoned on 23 September 2021 as an oil appraisal well.

### Testing

A DST was performed in the interval 3470.2 to 3482.2 m in the Rannoch Formation. The maximum flow rate achieved was during the clean-up flow; ca. 400 Sm<sup>3</sup>/day, GOR of 185 Sm<sup>3</sup>/Sm<sup>3</sup> on a 32/64" adjustable choke with a FWHP of 74 barg. The production declined during the following flow periods due to near-well bore geometry. The flow data are thus not representative for what will be achieved in a production well. Oil density was 0.827 g/cm<sup>3</sup> and the oil produced with 2.2% CO<sub>2</sub> and 2.5 ppm H<sub>2</sub>S. For long term monitoring of the reservoir pressure, two Metrol pressure gauge stations were installed above and across the perforations on a 7" EZSV plug set at 3449.2 m.



### Borekaks i Sokkeldirektoratet

|                               |                               |
|-------------------------------|-------------------------------|
| Borekaksprøve, topp dybde [m] | Borekaksprøve, bunn dybde [m] |
| 380.00                        | 3604.00                       |

|                                        |     |
|----------------------------------------|-----|
| Borekaks tilgjengelig for prøvetaking? | YES |
|----------------------------------------|-----|

### Borekjerne i Sokkeldirektoratet

| Kjerneprøve nummer | Kjerneprøve - topp dybde | Kjerneprøve - bunn dybde | Kjerneprøve dybde - enhet |
|--------------------|--------------------------|--------------------------|---------------------------|
| 1                  | 3449.0                   | 3503.9                   | [m ]                      |
| 2                  | 3503.9                   | 3553.3                   | [m ]                      |

|                                       |       |
|---------------------------------------|-------|
| Total kjerneprøve lengde [m]          | 104.3 |
| Kjerner tilgjengelig for prøvetaking? | YES   |

### Litostratigrafi

| Topp Dyb [mMD RKB] | Litostrat. enhet                 |
|--------------------|----------------------------------|
| 358                | <a href="#">NORDLAND GP</a>      |
| 358                | <a href="#">UNDIFFERENTIATED</a> |
| 1092               | <a href="#">UTSIRA FM</a>        |
| 1138               | <a href="#">HORDALAND GP</a>     |
| 1138               | <a href="#">NO FORMAL NAME</a>   |
| 1299               | <a href="#">NO FORMAL NAME</a>   |
| 1723               | <a href="#">ROGALAND GP</a>      |
| 1723               | <a href="#">BALDER FM</a>        |
| 1762               | <a href="#">SELE FM</a>          |
| 1773               | <a href="#">LISTA FM</a>         |
| 1920               | <a href="#">VÅLE FM</a>          |
| 1935               | <a href="#">SHETLAND GP</a>      |
| 1935               | <a href="#">JORSALFARE FM</a>    |
| 2221               | <a href="#">KYRRE FM</a>         |
| 3150               | <a href="#">TRYGGVASON FM</a>    |
| 3386               | <a href="#">CROMER KNOLL GP</a>  |
| 3386               | <a href="#">MIME FM</a>          |
| 3398               | <a href="#">VIKING GP</a>        |



|      |                                     |
|------|-------------------------------------|
| 3398 | <a href="#">DRAUPNE FM</a>          |
| 3405 | <a href="#">INTRA DRAUPNE FM SS</a> |
| 3427 | <a href="#">HEATHER FM</a>          |
| 3457 | <a href="#">BRENT GP</a>            |
| 3457 | <a href="#">TARBERT FM</a>          |
| 3468 | <a href="#">RANNOCH FM</a>          |
| 3553 | <a href="#">DRAKE FM</a>            |

Logger

| Type logg                           | Topp dyp<br>for logg [m] | Bunn dyp for<br>logg [m] |
|-------------------------------------|--------------------------|--------------------------|
| AIT QGEO PPC MSIP PEX EMA JAR       | 335                      | 3605                     |
| LWD - PWD RES GR DI                 | 445                      | 510                      |
| LWD - PWD RES GR DI NE DN<br>SON SV | 3449                     | 3603                     |
| LWD - PWD RES GR DI NEU DEN<br>SON  | 1218                     | 3449                     |
| LWD - PWD RES GR DI SON             | 358                      | 445                      |
| LWD - PWD RES GR DI SON             | 510                      | 1218                     |
| MDT JAR                             | 3335                     | 3565                     |
| NEXT HNGS CMR XPT EMA JAR           | 3335                     | 3565                     |

Foringsrør og formasjonsstyrketester

| Type utforing | Utforing<br>diam.<br>[tommer] | Utforing<br>dybde<br>[m] | Brønnbane<br>diam.<br>[tommer] | Brønnbane<br>dyp<br>[m] | LOT/FIT slam<br>eqv.<br>[g/cm3] | Type<br>formasjonstest |
|---------------|-------------------------------|--------------------------|--------------------------------|-------------------------|---------------------------------|------------------------|
| PILOT HOLE    | 30                            | 370.4                    | 9 7/8                          | 510.0                   | 0.00                            |                        |
| INTERM.       | 20                            | 1206.0                   | 26                             | 1214.0                  | 0.00                            |                        |
| INTERM.       | 9 5/8                         | 3334.8                   | 12 1/4                         | 3340.0                  | 1.75                            | LOT                    |
| LINER         | 7                             | 3602.0                   | 8 1/2                          | 3603.0                  | 2.05                            | LOT                    |

Boreslam

| Dybde<br>MD [m] | Egenvekt,<br>slam<br>[g/cm3] | Viskositet,<br>slam<br>[mPa.s] | Flytegrense<br>[Pa] | Type slam | Dato, måling |
|-----------------|------------------------------|--------------------------------|---------------------|-----------|--------------|
| 444             | 1.20                         |                                | 10.0                | Water     |              |
| 679             | 1.32                         |                                | 9.0                 | Water     |              |
| 1214            | 1.39                         |                                | 11.0                | Water     |              |
| 1218            | 1.46                         |                                | 10.5                | Synthetic |              |



|      |      |  |      |           |  |
|------|------|--|------|-----------|--|
| 2393 | 1.52 |  | 12.9 | Synthetic |  |
| 3146 | 1.52 |  | 5.2  | Oil       |  |
| 3146 | 1.03 |  |      | Water     |  |
| 3340 | 1.58 |  | 11.4 | Synthetic |  |
| 3340 | 1.52 |  | 7.6  | Synthetic |  |
| 3449 | 1.52 |  | 5.7  | Synthetic |  |
| 3495 | 1.52 |  | 5.2  | Oil       |  |
| 3603 | 1.51 |  |      | Brine     |  |
| 3603 | 1.52 |  | 5.7  | Oil       |  |