



## **General information**





|                              |                                  |
|------------------------------|----------------------------------|
| Wellbore name                | 15/5-1                           |
| Type                         | EXPLORATION                      |
| Purpose                      | WILDCAT                          |
| Status                       | P&A                              |
| Factmaps in new window       | <a href="#">link to map</a>      |
| Main area                    | NORTH SEA                        |
| Field                        | <a href="#">GINA KROG</a>        |
| Discovery                    | <a href="#">15/5-1 Gina Krog</a> |
| Well name                    | 15/5-1                           |
| Seismic location             |                                  |
| Production licence           | <a href="#">048</a>              |
| Drilling operator            | Norsk Hydro Produksjon AS        |
| Drill permit                 | 186-L                            |
| Drilling facility            | <a href="#">TREASURE SEEKER</a>  |
| Drilling days                | 134                              |
| Entered date                 | 26.11.1977                       |
| Completed date               | 08.04.1978                       |
| Release date                 | 08.04.1980                       |
| Publication date             | 05.01.2015                       |
| Purpose - planned            | WILDCAT                          |
| Reentry                      | NO                               |
| Content                      | GAS/CONDENSATE                   |
| Discovery wellbore           | YES                              |
| 1st level with HC, age       | MIDDLE JURASSIC                  |
| 1st level with HC, formation | VESTLAND GP                      |
| Kelly bushing elevation [m]  | 25.0                             |
| Water depth [m]              | 119.0                            |
| Total depth (MD) [m RKB]     | 3775.0                           |
| Maximum inclination [°]      | 3.8                              |
| Bottom hole temperature [°C] | 133                              |
| Oldest penetrated age        | LATE TRIASSIC                    |
| Oldest penetrated formation  | HEGRE GP                         |
| Geodetic datum               | ED50                             |
| NS degrees                   | 58° 35' 4.37" N                  |
| EW degrees                   | 1° 39' 8.35" E                   |
| NS UTM [m]                   | 6494728.58                       |
| EW UTM [m]                   | 421641.42                        |
| UTM zone                     | 31                               |
| NPDID wellbore               | 315                              |



## Wellbore history

### General

Well 15/5-1 was drilled on the Ve Sub-basin north of the Sleipner Vest Field in the North Sea. The main objective of the well was to test sandstone reservoirs of Middle Jurassic age. In the nearby Sleipner field (in block 15/6 and 15/9) gas had been found previously in reservoirs of the same age. The well was located down flank on the structure at the Kimmerian level. This position was chosen to penetrate reservoirs believed to be wedging both above and below a strong seismic marker ("Red Marker").

### Operations and results

Wildcat well 15/5-1 was spudded with the semi-submersible installation Treasure Seeker on 26 November 1977 and drilled to TD at 3775 m in Late Triassic sediments belonging to the Hegre Group. This was the first well drilled by Treasure Seeker, which was outfitted in Stavanger. About 25% of total rig time was counted as lost time, mainly due to wait-on-weather or equipment problems caused by rough weather in wintertime. The well was drilled with seawater and gel down to 1225 m, with seawater/gel/CMC/Spersene from 1225 m to 1910 m, and with a freshwater-based Spersene/gel/chrome-lignosulphonate/Drispac mud from 1910 m to TD.

The 15/5-1 well encountered gas condensate-bearing sandstones of Late and Middle Jurassic age (Callovian and Bathonian) from top at 3558 m down to 3614 m where a Bathonian/Bajocian deltaic series with up to five m thick coal beds appeared. From wireline log evaluation the sandstone section with a gross thickness of 56 m, has been subdivided into four separate pay zones, each zone being separated by thin impermeable layers, resulting in a net sand pay of 42.1 m. Average porosity was calculated to 14% and the average water-saturation to 14%. Sands were water wet below the coal beds at 3650 m. The actual oil-water contact was not seen. The strong seismic "Red Marker" was correlated to the top of the deltaic coaly sequence of Middle Jurassic age. Oil shows were recorded on limestone in intervals from 2804 m to 2904 m (Tor Formation), from 3180 m to 3190 m (Hod Formation), and from 3365 m to 3375 m (top of Rødby Formation). Below the hydrocarbon-bearing reservoir, oil shows were recorded on sandstones in the intervals 3650 m to 3657 m and 3725 m to 3740 m.

Three cores were cut from 3561 m to 3601 m and two cores were cut from 3609 m to 3625.5 m. RFT samples were taken at 3560 m and 3611.8 m. They were found not to be representative of the formation fluid.

The well was permanently abandoned on 7 April 1977 as a condensate discovery.

### Testing

Two zones were production tested

DST1 tested the interval 3610 m to 3614 m. The flow did not stabilise. On average, a production of 35720 Sm<sup>3</sup> gas and 18.1 Sm<sup>3</sup> oil /day through a 12/64" choke is reported. The GOR was ca 1970 Sm<sup>3</sup>/Sm<sup>3</sup>, the oil gravity was 43.0 °API and the gas gravity was 0.804 (air = 1). The bottom hole temperature was 125.6 °C.

DST2 tested the interval 3561 m to 3584 m. The test produced 660270 Sm<sup>3</sup> gas and 474 Sm<sup>3</sup> oil /day through a 48/64" choke. The GOR was 1390 Sm<sup>3</sup>/Sm<sup>3</sup>, the oil gravity was 43.4 °API, and the gas gravity was 0.778 (air = 1). The bottom hole temperature was 126.7 °C.

**Cuttings at the Norwegian Offshore Directorate**

|                               |                                   |
|-------------------------------|-----------------------------------|
| Cutting sample, top depth [m] | Cutting samples, bottom depth [m] |
| 200.00                        | 3728.00                           |

|                                  |     |
|----------------------------------|-----|
| 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                  | 3561.0                  | 3577.9                     | [m ]                    |
| 2                  | 3578.5                  | 3590.2                     | [m ]                    |
| 3                  | 3591.1                  | 3600.4                     | [m ]                    |
| 4                  | 3609.0                  | 3620.0                     | [m ]                    |
| 5                  | 3623.0                  | 3624.5                     | [m ]                    |

|                               |      |
|-------------------------------|------|
| Total core sample length [m]  | 50.4 |
| Cores available for sampling? | YES  |

**Core photos**

3562-3565m



3565-3566m



3566-3568m



3568-3570m



3570-3572m



3572-3574m



3574-3575m



3575-3577m



3577-3577m



3578-3580m



3580-3582m



3582-3583m



3583-3585m



3585-3587m



3587-3589m



3589-3592m



3592-3593m



3593-3595m



3595-3597m



3597-3599m



3599-3600m



3609-3610m



3610-3612m



3612-3614m



3614-3616m



3616-3617m



3623-3624m

**Palynological slides at the Norwegian Offshore Directorate**

| Sample depth | Depth unit | Sample type | Laboratory |
|--------------|------------|-------------|------------|
| 3616.8       | [m]        | C           | RRI        |

**Lithostratigraphy**

| Top depth<br>[mMD RKB] | Lithostrat. unit             |
|------------------------|------------------------------|
| 144                    | <a href="#">NORDLAND GP</a>  |
| 777                    | <a href="#">UTSIRA FM</a>    |
| 1150                   | <a href="#">HORDALAND GP</a> |
| 1706                   | <a href="#">FRIGG FM</a>     |
| 2057                   | <a href="#">ROGALAND GP</a>  |
| 2057                   | <a href="#">BALDER FM</a>    |
| 2106                   | <a href="#">SELE FM</a>      |
| 2164                   | <a href="#">HEIMDAL FM</a>   |
| 2573                   | <a href="#">LISTA FM</a>     |



|      |                                 |
|------|---------------------------------|
| 2610 | <a href="#">TY FM</a>           |
| 2644 | <a href="#">SHETLAND GP</a>     |
| 2644 | <a href="#">EKOFISK FM</a>      |
| 2701 | <a href="#">TOR FM</a>          |
| 2904 | <a href="#">HOD FM</a>          |
| 3240 | <a href="#">BLODØKS FM</a>      |
| 3299 | <a href="#">HIDRA FM</a>        |
| 3363 | <a href="#">CROMER KNOLL GP</a> |
| 3363 | <a href="#">RØDBY FM</a>        |
| 3492 | <a href="#">VIKING GP</a>       |
| 3492 | <a href="#">DRAUPNE FM</a>      |
| 3558 | <a href="#">VESTLAND GP</a>     |
| 3558 | <a href="#">HUGIN FM</a>        |
| 3616 | <a href="#">SLEIPNER FM</a>     |
| 3729 | <a href="#">HEGRE GP</a>        |

**Geochemical information**

| Document name             | Document format | Document size [MB] |
|---------------------------|-----------------|--------------------|
| <a href="#">315_GCH_1</a> | pdf             | 0.11               |
| <a href="#">315_GCH_2</a> | pdf             | 3.47               |
| <a href="#">315_GCH_3</a> | pdf             | 0.88               |

**Documents - older Norwegian Offshore Directorate WDSS reports and other related documents**

| Document name                                   | Document format | Document size [MB] |
|-------------------------------------------------|-----------------|--------------------|
| <a href="#">315_01_WDSS_General_Information</a> | pdf             | 0.43               |
| <a href="#">315_03_WDSS_lithlog</a>             | pdf             | 0.09               |

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

| Document name                                | Document format | Document size [MB] |
|----------------------------------------------|-----------------|--------------------|
| <a href="#">315_15_5_1_Completionlog</a>     | pdf             | 3.51               |
| <a href="#">315_15_5_1_Completion_report</a> | pdf             | 9.87               |



**Drill stem tests (DST)**

| Test number | From depth MD [m] | To depth MD [m] | Choke size [mm] |
|-------------|-------------------|-----------------|-----------------|
| 1.0         | 3610              | 3614            | 4.8             |
| 2.0         | 3561              | 3584            | 19.0            |

| Test number | Final shut-in pressure [MPa] | Final flow pressure [MPa] | Bottom hole pressure [MPa] | Downhole temperature [°C] |
|-------------|------------------------------|---------------------------|----------------------------|---------------------------|
| 1.0         |                              |                           |                            |                           |
| 2.0         |                              |                           |                            |                           |

| Test number | Oil [Sm3/day] | Gas [Sm3/day] | Oil density [g/cm3] | Gas grav. rel.air | GOR [m3/m3] |
|-------------|---------------|---------------|---------------------|-------------------|-------------|
| 1.0         | 18            | 33700         | 0.810               |                   | 1861        |
| 2.0         | 474           | 622900        | 0.800               |                   | 1320        |

**Logs**

| Log type | Log top depth [m] | Log bottom depth [m] |
|----------|-------------------|----------------------|
| CBL      | 700               | 2688                 |
| CBL      | 1650              | 3295                 |
| DLL MSFL | 3545              | 3598                 |
| FDC CNL  | 705               | 3773                 |
| HDT      | 1700              | 3773                 |
| ISF SON  | 192               | 3775                 |
| RFT      | 8                 | 3611                 |
| RFT      | 3280              | 3738                 |
| RFT      | 3560              | 3597                 |
| RFT      | 3596              | 3728                 |
| VELOCITY | 500               | 3772                 |

**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                  | 194.0            | 36                | 194.5          | 0.00                     | LOT                 |
| SURF.COND.  | 20                  | 705.0            | 26                | 712.0          | 0.00                     | LOT                 |
| INTERM.     | 13 3/8              | 2722.0           | 17 1/2            | 2738.0         | 0.00                     | LOT                 |



|           |       |        |        |        |      |     |
|-----------|-------|--------|--------|--------|------|-----|
| INTERM.   | 8 5/8 | 3497.0 | 12 1/4 | 3511.0 | 0.00 | LOT |
| OPEN HOLE |       | 3766.0 | 8 1/2  | 3775.0 | 0.00 | LOT |

### Drilling mud

| Depth MD [m] | Mud weight [g/cm3] | Visc. [mPa.s] | Yield point [Pa] | Mud type   | Date measured |
|--------------|--------------------|---------------|------------------|------------|---------------|
| 194          | 1.08               |               |                  | waterbased |               |
| 468          | 1.08               |               |                  | waterbased |               |
| 1065         | 1.12               |               |                  | waterbased |               |
| 1910         | 1.18               |               |                  | waterbased |               |
| 2733         | 1.26               |               |                  | waterbased |               |
| 3511         | 1.34               |               |                  | waterbased |               |
| 3775         | 1.46               |               |                  | waterbased |               |

### 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 format | Document size [MB] |
|----------------------------------------------------------|-----------------|--------------------|
| <a href="#">315 Formation pressure (Formasjonstrykk)</a> | pdf             | 0.21               |

