



Department
of Energy &
Climate Change

**MAERSK OIL NORTH SEA LIMITED
FLYNDRE AND CAWDOR FIELD DEVELOPMENTS
Environmental Statement Summary**

To: Wendy Kennedy

From: Inger Söderström

Date: 28 November 2013

ES Title:	Flyndre and Cawdor Field Developments
Operator:	Maersk Oil North Sea Limited (Maersk)
Consultants:	Genesis Oil and Gas Consultants Limited
Field Group (DECC):	Central North Sea, Aberdeen
ES Report No:	D/4114/2011
ES Date:	June 2011 and updated in 2013
Block Nos:	30/13c and 30/14 (field also straddles Norwegian Block 1/5a)

Development Type: Field development utilising a previously drilled and suspended well at Flyndre and drilling up to three wells at Cawdor, which will all be tied back to the existing Clyde Platform approximately 26 kilometres (km) to the west via a new 12" / 8" Pipe-in-Pipe (PIP) pipeline system.

Project Description

The Flyndre and Cawdor fields are located in Blocks 30/13C and 30/14 on the UKCS, and the Flyndre field also straddles Block 1/5a in the Norwegian Sector. Both fields lie in the south eastern part of the Central Graben Basin, approximately 293 kilometres east-south-east of Aberdeen, in water depths of approximately 70 metres (m). The Flyndre field is approximately 2 km to the north of the Cawdor field.

Maersk plan to develop the fields by initially utilising the existing Flyndre appraisal well and drilling one production well at Cawdor. Depending upon production levels, a further two wells may be drilled at Cawdor. The wells will be tied back to the existing Clyde Platform via a new common 12" / 8" pipe-in-pipe pipeline system, with a 4.2 km section running from Flyndre to Cawdor and a 20.46 km section running from Cawdor to Clyde (overall 24.66 km). It is anticipated that approximately 340 mattresses and 29,000 tonnes of rock will be required to construct and protect pipeline crossings and to prevent upheaval buckling.

Installation of the risers is scheduled for Q2 2014 and installation of the pipeline system and other subsea infrastructure is scheduled for Q2-4 2015. First oil is expected from Flyndre in

Q2 2016, with an anticipated field life of 11 years. Drilling of the Cawdor Phase I well will also commence in Q2 2016, with first oil expected in Q3 2017. The Cawdor Phase II drilling would take place in Q1-2 2019, with first oil expected from these wells in Q3-4 2019 and an overall field life of 10 years.

Based on the projected P10 (highest) recovery rate, it is estimated that the maximum recoverable reserves from the Flyndre and Cawdor fields will be 5.9 million tonnes of oil and 2.2 billion cubic metres of gas. Peak daily oil production from the Flyndre field is expected in 2016, with a maximum production rate of approximately 2,350 tonnes/day (t/d), declining to approximately 125 t/d in 2026. Peak daily oil production from the Cawdor field is expected in 2023, with a maximum production rate of approximately 660 t/d. Peak oil production from the combined fields is expected in 2016, with a maximum production rate of approximately 2,370 t/d. Peak gas production from the Flyndre Field is expected in 2016, with a maximum production rate of approximately 610 thousand cubic metres a day (Mm³/d), declining to approximately 35 Mm³/d in 2026. Peak gas production from the Cawdor field is expected in 2026, with a maximum production rate of approximately 450 Mm³/d. Peak gas production from the combined fields is expected in 2020, with a maximum production rate of approximately 620 Mm³/d.

Key Environmental Sensitivities

The EIA identified the following sensitivities:

- Spawning area for lemon sole (April to September) and Norway pout (January to April), sprat (May to August), and mackerel (May to August).
- Nursery area for Norway pout, haddock and whiting.
- High seabird vulnerability in Block 30/13 in January, but moderate to low in the development area for the rest of the year.
- Minke whales, harbour porpoises, Atlantic white-sided dolphin and white-beaked dolphin have been recorded in relatively high numbers in the CNS, but the Scans II survey estimated that the densities of minke whales and harbour porpoises in Area V (where the proposed development is located) were only 0.028 per km² and 0.294 per km² respectively. As the proposed development is approximately 270 km offshore, grey and common seals are unlikely to be found in the area.
- The nearest Annex I habitat to the proposed development is the Dogger Bank pSAC, located 120 km to the south.

Key Potential Environmental Impacts

The EIA identified the following potential impacts and related mitigation measures:

- **Physical Presence:** Appropriate mitigation measures will be in place to ensure other sea users are aware of the proposed activities, e.g. 500m safety zones around the drilling rig and well heads, and including warnings in Kingfisher Bulletins and Notices to Mariners etc. Any impact on shipping and navigation is considered to be negligible due to low volumes of shipping and the limited fishing in the area.

- **Seabed disturbance:** A number of the proposed activities will impact the seabed, including the footprint of drilling rig spud cans and/or anchors, the discharge of drill cuttings and the installation of the pipeline system and associated mattresses and rock deposits. The top-hole sections of the Cawdor wells (36" and 17¹/₂"") will be drilled using seawater and high viscosity sweeps, with each well producing approximately 520 m³ of cuttings which will be discharged to the seabed. The lower sections (12¹/₄ and 8¹/₂"") will be drilled with Low Toxicity Oil Based Mud (LTOBM), with each well producing approximately 780 m³ of cuttings which will be treated offshore prior to discharge. Although this will result in smothering of benthic communities in the vicinity of the wells, it is anticipated that the impact will be temporary and the communities will recover following completion of drilling. The pipeline system will be trenched and buried and additionally protected by the deposit of concrete mattresses and rock, and these operations will also impact the benthic communities. However, the site specific environmental survey undertaken in support of the proposals indicated the species composition and habitat along the route are typical of the area, and only a very small proportion of the local habitat will be impacted by the proposed operations. The benthic communities and habitat are also expected to be replaced or recover within a relatively short period of time
- **Noise:** Noise will be generated during the drilling operations, the pipe-lay operations, the piling operations associated with the installation of the two manifolds and the production operations at the Clyde Platform. The piling will be the only significant sound source, and it is estimated that it will take between 8 to 10 hours per manifold. Modelling has been undertaken, which indicated that the sound levels capable of causing a permanent threshold shift in hearing are likely to be restricted to the immediate vicinity of the pile-driver, and the levels will drop below both the permanent and temporary shift thresholds 6 m from the source,. Whilst the piling may result in some disturbance to cetaceans, the limited duration means there is unlikely to be chronic or sustained disturbance and animals are expected to return to the area as soon as the piling ceases. Although significant adverse effects are very unlikely, Maersk intends to follow the JNCC protocol for minimising the risk of disturbance and injury to marine mammals from the piling operations.
- **Atmospheric Emissions:** Atmospheric emissions will result from the power generation during the drilling of the wells (including well testing) and the production operations, and from the operation of the pipelay vessels, the heavy lift vessels and the standby vessels. The drilling of the wells is estimated to result in emissions of approximately 15,900 tonnes of CO₂, and the installation operations are estimated to result in emissions of approximately 34,300 tonnes of CO₂. There will be an increase in emissions at the Clyde Platform, but the project will utilise existing ullage within the Clyde Platform processing systems and will not result in a significant increase in power demand. It is anticipated that there will be rapid natural dispersion of emissions and, although they will contribute to the regional and global emissions, they are unlikely to have any significant impact.
- **Marine Discharges:** Cuttings from the Cawdor Wells will be discharged to sea at the drilling locations and, following installation, the pipeline system will be pressure tested and the contents, including any chemical additives, will be discharged to sea at the Clyde Platform. During production, the fluids from the Flyndre and Cawdor fields will be processed on the Clyde Platform, with associated produced water discharged to

sea. Produced water discharges are expected to remain below historic discharge levels at the Clyde Platform, and none of the discharges are expected to have a significant impact. A detailed risk assessment for the chemicals to be used and discharged during the drilling, pipeline and production operations will be included in the relevant chemical permit applications.

- **Accidental Events:** Modelling was undertaken for releases of approximately 5,875 t/d and 3,190 t/d of crude oil, representing the worst-case spill scenarios for well blow-outs at Flyndre and Cawdor respectively. Modelling was also undertaken for a spill of approximately 1,145 tonnes of diesel, which is a typical fuel inventory for drilling rigs likely to be used for the development. Maersk will have appropriate control measures and an approved Oil Pollution Emergency Plan in place prior to commencing all operations.
- **Cumulative Impacts:** The proposed development is in a well-developed oil and gas area in the North Sea and will be tied-back to the Clyde Platform. The nearest surface infrastructure to the Clyde Platform is approximately 6.5 km away, and there are no licensed dredging or offshore wind developments or proposals in the area of the proposed development. The levels of fishing and shipping in the area are also low, and it is therefore considered unlikely that the development will have a significant effect in combination with other projects.
- **Transboundary Impacts:-** The Cawdor Field lies approximately 5 km from the UK / Norway median line and the Flyndre Field straddles three blocks, two in the UK sector and the third in the Norwegian sector. However, both fields will be tied back to the Clyde Platform which is located approximately 25 km further to the west, away from the median line. Any routine discharges and emissions relating to the developments are expected to disperse rapidly, and no transboundary impacts are anticipated. In the event of a blow-out, oil spill modelling indicates oil could impact Norwegian, Danish, German or Dutch waters, but it is not anticipated that there would be any beaching of the spilled oil.

Consultation

Comments were requested from the Joint Nature Conservation Committee (JNCC), the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Marine Scotland (MS), the Ministry of Defence (MOD), the Maritime and Coastguard Agency (MCA), the Northern Lighthouse Board (NLB) and the Norwegian Climate and Pollution Agency, Norway. The Environmental Statement (ES) was also subject to Public Notice. The comments received are summarised below:

JNCC: JNCC confirmed they are content for the proposed operations to receive consent.

CEFAS (Environment): Cefas confirmed they had no concerns in relation to marine environmental issues, but recommended that MS should be consulted because of the proximity to the England / Scotland median line.

CEFAS (Chemicals): Cefas confirmed that they had no concerns in relation to the use and discharge of offshore chemicals, or the disturbance of the Clyde Platform cuttings pile during

the installation of the Flyndre and Cawdor riser / umbilical.

MS: MS requested copies of the site specific surveys referenced in the ES, and confirmed that they had no concerns.

MOD: MOD confirmed they had no objections.

MCA: MCA confirmed they had no objections on safety of navigation grounds, subject to the application of standard navigational conditions at the activity-specific consenting stage.

NLB: NLB confirmed they had no objections, but indicated that detailed recommendations will be provided during the Consent to Locate application process. They also confirmed that the geographical locations (WGS84 datum) of all subsea structures should be notified to the United Kingdom Hydrographic Office in order that Admiralty Chart BA272 can be revised accordingly, and requested notification of any rig moves.

Norwegian Climate and Pollution Agency: Klif indicated that operations in the vicinity of the median line were comparatively minor, and that no impacts are anticipated. They requested a copy of the high level impact assessment relating to the use of the hammer mill technology to treat cuttings contaminated with LTOBM that was referenced in the ES, and confirmed that in case of an accidental oil spill the Norwegian Coastal Administration should be notified.

Public Notice: No comments were received in response to the Public Notice.

Further Information

DECC requested further information in relation to the integrity and installation of the pipeline and umbilical systems; flaring; emissions and discharges at the Clyde Platform, including produced water discharges; the disturbance of drill cuttings at the Clyde Platform; oil spill emergency planning; and potential transboundary impacts. The requested additional information was provided by Maersk.

Conclusions

Following the consultation and the provision of the additional information, DECC is satisfied that this project is not likely to have a significant impact on the receiving environment, including any sites or species protected under the Habitats Regulations.

Recommendation(s)

DECC OGED has no objection to the Flyndre and Cawdor Fields being granted developments consent, but reserves the right to request supplementary information and review this decision if there are any significant changes to the Field Development Plan that could have a material effect on the information provided in the ES.

Approved

Wendy Kennedy

16/12/2013

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Date:-.....

Wendy Kennedy

Head of Offshore Oil and Gas Environment and Decommissioning (OGED)