

**RWE DEA UK SNS LIMITED
CLIPPER SOUTH FIELD DEVELOPMENT
Environmental Statement Summary**

To: Sarah Pritchard- Head of Offshore Environmental Operations

From: Tracy Edwards- Environmental Manager

Date: 21 February 2011

ES Title:	Clipper South Field Development
Operator:	RWE DEA UK SNS Limited
Consultants:	
Field Group (DECC):	SNS - Ivor Newman/Alison D'Arcy/Helen Hitchen
ES Report No:	D/4081/2010
ES Date:	14 May 2010
Block Nos:	48/19a, 48/19c, 48/20a and 48/20b
Development Type:	Gas Field

Project Description

The development lies in the SNS and the nearest landfall is at Sheringham approximately 60 km to the west on the English coastline with the UK/NL median line 85 km to the east of the installation. Water depths are shallow (33m maximum).

The field will be developed from a normally unmanned installation (NUI) with a design based on an open truss integrated deck with a four-legged jacket that will be piled into place. There is a single surface location at the platform for 5 producing horizontal wells. Drilling will be by jack-up and undertaken in 2 phases. Phase 1 will cover the drilling of 4 wells. Each well will have multiple fracking. Phase 2 will see drilling of the 5th well when steady state production has been achieved and there is a contingency for a 6th well if necessary. The wells will be drilled using Water Based Mud (WBM) for all sections except the 6" section which will be drilled using Low Toxicity Oil Based Mud (LTOBM).

The NUI will be tied in to the Lincolnshire Offshore Gas Gathering System (LOGGS) complex by a 15 km long, 12" carbon steel export pipeline and a 3" piggybacked line carrying methanol and corrosion inhibitor. The pipeline will be trenched and mechanically backfilled following pre-sweeping operations to prepare the seabed. No treatment of well fluids will take place at the NUI therefore all fluids will be transported to the LOGGS platform for compression and export via the LOGGS 36" line back to Theddlethorpe Gas Terminal. Rock dumping and matting will be required at pipeline crossings for protection and allow over-trawling.

Construction and installation is planned for Q2/3 2011, with first gas planned for Q1 2012. The field life is anticipated to be 15 years, however the development is designed for a minimum of 20 years. The production rate is expected to peak at a maximum of 92 MMscf/day in 2013.

Key Environmental Sensitivities

The EIA process has identified the following environmental sensitivities:

- The proposed development is located wholly within the North Norfolk and Saturn Reef candidate SAC, (cSAC). There are two qualifying features of this site – ‘sandbanks which are slightly covered by sea water all the time’ and the Saturn *Sabellaria spinulosa* ‘reef’
- Fish spawning occurs in the area for lemon sole, mackerel and sandeels.
- The area supports fish nursery areas for lemon sole, sandeels and whiting
- There is very high seabird vulnerability in March and November, with high seabird vulnerability during February, April, August and October.
- Cetacean numbers are low for the area, although low to medium densities of Harbour Porpoises have been recorded.
- Shipping density is considered moderate.
- Fishing effort is moderate for blocks 48/19 and 48/20 peaking April to June.

Key Potential Environmental Impacts

Potential impacts on the environment were documented in the ES and additional information provided.

1. Physical Presence of the Drilling Rig and Stabilisation

- **Spud Cans**

The placement of the spud cans of the jack-up rig on the seabed will disturb localised areas of seabed. A typical jack-up rig can be expected to impact approximately 0.000316 km² of seabed. Where existing spud can footprints are evident the rig will re-position within these minimising further impact. Any residual impact will be of comparatively short-term duration, and recovery to pre-impact levels is likely to take place through recolonisation of the disturbed area.

- **Rig Stabilisation**

Contingency deposits of rock totalling 6000 tonnes are included in the event that scour issues are experienced for the two phases of drilling. Deposits will be highly localised and will fall within the 500m zone around the installation. Although sediment changes will occur, it is anticipated that these would be short lived, with natural infill occurring once the rig has moved off location. Impacts will be further mitigated by the interval between drilling operations.

2. Drilling Discharges

Drilling operations will involve the use and discharge of water based muds (WBM) and the cuttings will also be discharged to sea. However, the bottom-hole sections (6”) will be drilled using Low Toxicity Oil Based Mud (LTOBM). These cuttings and the LTOBM will be skipped and shipped to shore for treatment and/or disposal.

- **Discharge of WBM**

Water Based Muds have typically low toxicity and the majority of the constituent chemicals are PLONOR rated (Pose Little Or NO Risk) and surveys of trace metals in the area reveal that levels are at or below background concentrations. Therefore the discharge of WBM is unlikely to cause any significant impact.

- **Discharge of cuttings**

Cuttings from a single well have been modelled to cover an ellipse extending 20km

NW-SE and 2.5km NE-SW with a maximum depth of 0.77mm decreasing to 0.01mm. Impacts on benthos are considered to be negligible, given that the depth of deposition is less than 1mm. and the highly dynamic nature of the marine environment in this area of the SNS. Studies in analogous areas have shown that drill cuttings discharges are not discernable after about 16 days.

- **Fracking Operations**

A total of 6900 tonnes of proppant will be used for all five wells to maintain fractures for enhanced production. Of this an estimated 250 tonnes of cleaned, inert proppant will be discharged to the water column (approximately 50 tonnes for each well) over the course of the two drilling campaigns. Impacts will be mitigated by a filtration system and are considered negligible, given the small amounts and inert nature of the material discharged. Chemical discharges associated with the fracking fluids will be subject to permitting under the Offshore Chemical Regulations (OCR) 2002.

3. Installation of Normally Unmanned Installation

An NUI will facilitate extraction of fluids from the Clipper South Field, occupying 0.000254km² of the North Norfolk Sandbanks and Saturn reef cSAC.

- **Noise:** Piling of the NUI will be undertaken over a four day period for all 4 piles, although piling typically takes 6 hours per pile. There will be increased subsea noise levels during piling but this is not considered to be significant.
- **Fishing:** When installation is completed it is expected the area will be available as a spawning and nursery area again. However, there will be a small decrease in the area available for commercial fishing due to the exclusion zone around the installation, but this is considered insignificant given the scale of this exclusion.
- **Shipping:** Activity is considered to be moderate in the area and the installation will conform with all navigational requirements.

4. Installation of the 12” pipeline and Piggy-Backed Chemical Line

A 15 km export line will connect the platform with the LOGGS platform. The pipeline will be wholly within the North Norfolk Sandbanks and Saturn Reef cSAC.

- **Pre-Sweeping:** Prior to pipeline installation the seabed will be levelled to aid installation. It is estimated a maximum of 46 sand-waves would require pre-sweeping, resulting, as a worst case estimate, in the removal of 150,000m³ of sand from the seabed along the pipeline route, including 39,406m³ removed from the Broken Bank (Annex I habitat). The footprint of pre-sweeping may result in a worst case scenario of 0.23 km² within the cSAC, but only 0.009% of the volume of the Annex I feature Broken Bank would be impacted.

Re-Deposit: A maximum of 150,000m³ of pre-sweep material will be deposited alongside the pre-swept areas in approximately 25 piles of 6,000m³. The area is dominated by active bedload transportation and the mechanism and location of swept deposits indicates there is therefore unlikely to be any significant overall losses from the sediment systems and it is expected the sand will naturally be returned to the sand-waves and the Broken Bank. Whilst there will be some smothering of habitats, the deposit areas are limited in size and number. The habitats are highly dynamic and the benthos communities are highly opportunistic species with the ability to recovery quickly from such disturbance.

- **Trenching and backfill operations:** It is estimated that the trenching and the

installation of the 12" export pipeline and associated chemical supply line would impact on approximately 0.15 km² of habitat within the North Norfolk Sandbanks and Saturn Reef cSAC. Sediments are predominantly sand within a dynamic environment. As the pipeline is to be trenched, sediment will be repositioned on either side of the trench. These 'berms' will then be pushed back into the trench by the backfill plough. The impact is considered to be localised and short-term.

- **Rock dumping:** Rock dumping for pipeline stabilisation is not anticipated, however, 700m³ of rock will be required for the new spool pieces at LOGGS to mitigate against known scour issues. The pipeline will have two pipeline and one cable crossings, each requiring mattresses and rock dumping to provide protection. The pipeline crossings will require a total of 1,600m³ of rock, the cable crossing requires 1,100m³ and Rock dumping operations will equate to a permanent, but highly localised modification of the seabed from a soft sandy substrate to a hard substrate. However, because operations will cover only 850m², this impact is not considered likely to be significant. Evidence from post-drilling surveys indicates that scour is possible around objects on the seabed, but the hard substrate areas are small and unlikely to have a significant impact on sediment transport pathways.

5. Operational Phase

The NUI will be subject to an exclusion zone, as discussed for installation.

- **Marine Discharges:** There are no planned discharges offshore from Clipper South. Produced water will be exported via the production line from LOGGS for separation and treatment at the Theddlethorpe gas terminal onshore. There will be no discharge of chemicals from the NUI as MEG and corrosion inhibitor will be supplied from, and returned to, the LOGGS via the piggybacked 3" chemicals line.
- **Atmospherics:** A maximum of 2 diesel generators will be required for use when the platform is manned. In addition, an existing compressor on LOGGS will be required to run for the first year. Although there will be incremental emissions from this requirement, they are not considered to be significant over the lifetime of the field.

6. Decommissioning Phase

Field life is estimated to be 15 years, with infrastructure designed for a 20 year life. Before the end of field life, arrangements for decommissioning will be developed in accordance with UK and international legislative requirements. Although the impact of decommissioning activities have not been addressed within the ES, decommissioning options have been considered in the design of the facilities and during project planning. Removal of the top-sides, jacket and pipelines has been included in the design, although the preferred option at this moment would be to leave the pipelines in-situ. It is not expected that the footprint of the decommissioning operations will have a permanent impact on the North Norfolk Sandbanks and Saturn Reef cSAC.

Consultee(s):

JNCC requested additional information on:

- Clarification of environmental survey data, including confirmation of the absence of *Sabellaria spinulosa* reef
- Pipeline trenching and stabilisation activities to ensure adequate depth and natural soils

stabilisation is achievable, minimising the requirement for rock-dumping.

- Pre-sweep operations in respect of potential impacts of the removal and deposition of spoil material.
- Consideration of the likelihood of significant impacts on the North Norfolk Sandbanks and Saturn Reef cSAC as a result of pre-sweep and pipeline installation on the sandbank feature of the site.

Responses received from RDUK were satisfactory

Cefas commented that there were no fisheries-related restrictions on drilling.

Cefas Whilst noting chemicals in the ES were generic, CEFAS highlighted that borate, cited for potential use in the fracturing fluid, may be categorised as 'very high concern' under new proposals by the European Chemicals Agency (ECA)

RDUK will consider detailed chemical selection with reference to the Offshore Chemical Regulations and Cefas advice when submitting the relevant chemical permit applications..

Public Consultation: No comments were received as a result of the public consultation.

Further Information: In addition to the consultee comments a number of issues were highlighted by DECC and further information was requested including clarification or additional evidence regarding well fracing, pre-sweeping, pipeline activities, assessment of drill cuttings impact, and some operational aspects.

Responses received from RDUK were satisfactory.

Appropriate Assessment

As the proposed development is within the cSAC for the North Norfolk Sandbanks and the Saturn Reef, a screening exercise has been undertaken to determine the potential for likely significant effects.

The screening exercise has determined that it can objectively be concluded that it is unlikely that the proposed development will have a significant effect on the North Norfolk Sandbanks and Saturn Reef candidate SAC.

Conclusion(s):

Following consultation and the provision of the additional information, DECC and its consultees are 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):

On the basis of the information presented within the ES and advice from consultees it is recommended that the ES should be approved.

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Sarah Pritchard

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Date