

**Venture North Sea Gas Limited.
[Centrica Energy]
Ensign Field Development
Environmental Statement Summary**

To: Sarah Pritchard

From: Sarah Dacre

Date: 1 April 2011

ES Title:	Ensign Field Development
Operator:	Venture North Sea Gas Ltd. [Centrica Energy]
Consultants:	Genesis Oil and Gas Consultants
Field Group (DECC):	London
ES Report No:	D/4093/2010
ES Date:	October 2010
Block No(s):	48/14a and 48/15a
Development Type:	Production via NPAI and tie-back

Project Description

The proposed Ensign Field Development comprises the following:

- The installation of a Not Permanently Attended Installation (NPAI);
- The drilling/completion of three production wells, two of which are existing appraisal wells (drilled from the NPAI) and one being a new subsea well.
- The installation of a 3km production line and umbilical to connect the new subsea well to the NPAI and the installation of a 24km pipeline from the NPAI to the Audrey A platform;
- Fluids from Ensign will be commingled with production fluids from the Audrey Fields and exported via LOGGS to the Theddlethorpe Gas Terminal via an existing platform;

Pipe-lay operations and tie-ins are proposed for Q2 2011 and first gas is anticipated for Q3 2011.

Key Environmental Sensitivities

The EIA identified the following environmental sensitivities:

- High shipping activity;
- Fishing effort is low, predominantly targeting crustacean and demersal species;
- Fish spawning area for herring (August to October), lemon sole (April to September); mackerel (May to August), *Nephrops* (all year), sprat (May to August), sole (March-May), sandeel (January-February, November-December), plaice (January-March, December). There are currently restrictions on drilling and seismic activities between August to October (inclusive) in block 48/14 to protect spawning herring stocks. Drilling should therefore not commence in this block during this time. It was advised that should Centrica Energy wish to pursue drilling at this restricted time a herring spawning ground survey will need to be undertaken to assess the suitability of the seabed sediment for herring

spawning. A herring spawning survey was conducted and results indicate that the seabed in the vicinity of the Ensign development is unsuitable for herring spawning. Subsequent environmental approvals will incorporate the conclusions to this survey.

- Seabird vulnerability is very high in March and November and high in February, August and October;
- Low numbers of cetaceans have been recorded in the Ensign area, primarily harbor porpoise, minke whale, white beaked dolphin and white sided dolphin;
- Annex I Habitats: Site surveys identified areas of *Sabellaria spinulosa* in the vicinity of the subsea well;
- Annex I Species: there are no Annex I species in the vicinity of the proposed development.
- Annex II Species: harbour porpoise occurs in low numbers, mainly in the summer months;
- Protected sites: The proposed Ensign development is within the boundary of the North Norfolk Sandbank and Saturn Reef cSAC.

Key Potential Environmental Impacts

The following potential impacts and mitigation were addressed in the EIA:

- **Obstacles to other marine activities during operations**
 - i. *Navigation* - during the construction, installation, drilling and production the main obstacles will be the drilling rig, pipelay vessel, DSV and associated standby vessels and the NPAI, supply vessels and periodic shuttle tanker. Shipping traffic density is high, where 19 traffic routes were identified within a 10nm radius of the proposed development with an annual traffic volume of 5,808 ships per year. A collision risk assessment will be expected for consent to locate applications of the rig and NPAI. Navigational consultees had no objections with the proposed development at the ES stage. A collision risk management plan will be in place to minimise the risk of vessel collision. Measures include advance notification to regular users of the area informing them of up-coming operations. In addition, safety zones will also be designated and the operations will be promulgated in advance through the Notices to Mariners, Navtex and VHF broadcast in line with the recommendations of the navigational authorities. All subsea structures will be 'fishing friendly' and protective mattresses will be used to minimise the impact of dropped objects and fishing equipment.
 - ii. *Marine aggregates* – concern was raised by an aggregate company working in the area with respect to potential loss of dredging area due to the location of the pipeline and NPAI.
- **Seabed disturbance** – As a result of the pipe lay activities, installation of subsea infrastructure, drilling activities and the presence of the NPAI there will be disturbance to the seabed through:
 - i. *Pipe lay activities* – it is proposed to lay a 3km production line and 24km pipeline from the NPAI to the Audrey platform. The pipelines will impact an area of 0.34km² and the installation and presence of the subsea infrastructure will impact an area of 0.000132km². Installation will physically disturb the seabed and benthic communities, as well as causing increased water column turbidity during installation activities. Pre and post installation surveys undertaken for previous developments in the area indicated benthic abundance increased post installation and there was no significant change in the types of community present.

At the pipeline crossings mattressing and rock dump will be deposited. A total of 140

mattresses and 40,000 tonnes of rock will be deposited, totalling an impact area of 0.04km². The deposit of these materials is not considered to have any additional impact beyond the impact area of the pipeline as they will be deposited within the area already disturbed by installation activities. However, deposits will create a different habitat type and potentially encourage benthic species into the area that favour hard substrates. The ecologically change would be localised and not considered to be a significant impact.

Although there will be a direct impact on the seabed, the working width of the pipeline corridor will be minimised and the residual impacts on sediments and water quality are considered to be negligible due to their temporary nature. In addition, impacts on local sediment transport are also considered to be negligible.

The installation of the pipelines will also have an impact on the benthic communities in the area. Although faunal communities will be severely impacted by trenching operations, there are a number of dominant taxa which are tolerant to smothering and physical disturbance and given the fact the species present are representative of that area of the North Sea, any impacts are considered to be low overall.

- ii. *Installation and presence of the NPAI* – the impacts on the seabed by the NPAI are not considered to be significant. Although the direct impact of the NPAI is long-term (c.20 years), the benthic communities are representative of that area of the North Sea and the installation of NPAI is not to have a significant impact. It is not anticipated that scour protection will be required, but Centrica will monitor for scour around the NPAI.
- iii. *Physical presence of the rig* - The placement of the spud cans of the jack-up rig on the seabed will disturb localised areas of seabed. Each spud-can impact area will be approximately 254m², therefore the total impact area of the 3 spud cans is estimated to be 763m². As there are two drilling locations, the total seabed impact of the rig is estimated to be 1,530m². In the event that rig stabilisation material is required, approximately 5,000 tonnes may be used, increasing the impact area. The positioning of the rig will result in localised physical disturbance of the seabed sediments and associated fauna and direct temporary loss of habitat caused by the placement of the spud cans. Although there will be shallow depressions created, recoverability of the sediments and the benthic fauna would be relatively quick. Once the rig has moved off location, re-colonisation of any impacted area will occur and due to the nature of the currents and sediments in the area it is expected that the deposited rock would become covered by sediment resulting in the surface of the seabed returning to its previous state.
- iv. *Mud and cuttings discharge* – Drilling operations within the Ensign Development area will include the use and discharge of WBM mud and cuttings to the sea-surface. For the three wells proposed, a worse-case scenario of 3,011m³ of mud will be used and 415 tonnes of cuttings will be discharged to the seabed.

Cuttings dispersion modelling was undertaken for a comparable location (Amanda well, Block 49/11) and predicted that the WBM and cuttings would be dispersed by the prevailing currents, depositing a layer of up to 1mm thick over an area of 900X100m (0.09km²), aligned at a NW-SE orientation. Within an area of 0.0001km², thicknesses of up to 6mm may be observed. However, it is expected that cuttings will disperse over time but will cause temporary physical smothering of benthic fauna and flora in the immediate area of the wells location. Re-colonisation is expected to be relatively rapid as the mud formulations are low toxicity and bioaccumulation is not persistent in the marine environment.

- **Underwater Noise** – the proposed development will generate noise from the following activities:
 - Drilling operations
 - Installation of the NPAI (piling)
 - Installation of pipelines and subsea infrastructure
 - Vessel activity

The noise disturbance expected as a result of the Ensign operations are all low frequency, where the main sound will be generated from the drilling and piling operations (195 and 228 dB re:1µPa respectively). The proposed operations are unlikely to exceed the sound pressure level injury thresholds. However, it is likely that the noise levels will exceed the behavioural thresholds, but not exceed the threshold over a distance of 1km from the sound sources. During the drilling period harbour porpoise are likely to be found in the area in low concentrations and therefore. Centrica are committed to undertaking operations in line with JNCC guidelines for minimising the risk of disturbance and injury to marine mammals and due to the short duration of activity, the residual impacts on marine mammals from noise is considered to be low. It can therefore be concluded that the proposed activities are unlikely to cause an offence to a European Protected Species.

- **Atmospheric emissions** – the main sources of atmospheric emissions will occur during the drilling operations, pipeline and NPAI installation and from operations and maintenance of the NPAI.

As a result of the Ensign development, expected CO₂ emissions will temporarily increase in the vicinity of the operations, however in comparison to UK emissions, the increase is thought to be negligible. In addition, the effects of all source emissions will be minimal due to rapid dispersion and drilling, construction and installation operations will be controlled through careful planning to minimise the timing of the operations.

- **Marine discharges** – the only foreseeable discharges associated with the proposed development will be through the drilling operations, pipeline commissioning and the use of rigs and vessels during construction. Although chemicals will be injected at the NPAI, no discharge of chemicals will occur offshore. All chemicals are CEFAS registered and are not considered to be significantly harmful to the environment. Further risk assessment will be undertaken in subsequent chemical permit applications for the drilling and pipeline operations and the NPAI. All produced water will be exported via LOGGS.
- **Accidental events** – The Ensign field development targets a gas reservoir, with associated condensate. A number of control measures will be in place to minimise the risk of accidental events and an Oil Pollution Emergency Plan (OPEP) and an Emergency Procedures Plan (EPP) will be completed for the drilling operations and the NPAI. Based on stochastic modelling of a blow-out scenario (0.994m³/hr for 336 hrs) beaching on UK waters would occur within 35 hours or on Dutch coastline in 92 hours.
- **Cumulative and Transboundary Impacts** – The area of the proposed development is subject to a range of oil and gas operations, shipping and commercial fishing, and these are unlikely to have a significant effect in combination with the proposed project.

Approximately 60% of the aggregate license area 408 is located within the boundary of the cSAC where dredging operations periodically remove sand and gravel permanently from the cSAC. However, due to the mobile nature of the sediments in this area of the North Sea, areas where dredging takes place are replenished over time. The industry is also highly

regulated and the net sediment loss and gain are carefully monitored. With respect to oil and gas operations, it is estimated that a total subsea footprint is approximately 16km² and the Ensign Development is estimated to comprise 2.2% of this total, but 0.25% is considered to be permanent. In the context of the aggregates activity and the wider oil and gas operations, the proposed Ensign development is not considered to have an in-combination effect on the cSAC.

There was concern expressed by the holder of License 408 regarding sterilisation of their aggregate zones and potential loss of revenue. Over the period of the ES review process agreements were drawn between the parties and any conflict of interest issues were resolved.

The nearest transboundary line is the UK/Dutch, approximately 78km from the Ensign development and therefore it can be concluded there are no transboundary issues.

▪ **Annex 1 Habitats**

A Habitats Regulations Assessment was undertaken to identify and consider the likely significance of impacts upon the North Norfolk Sandbanks and Saturn Reef cSAC of the proposed Ensign Development, either alone or in combination with other plans or projects. The HRA concluded that the Ensign development is unlikely to have a significant effect alone or in combination with other projects upon the integrity of the Natura 2000 site, the North Norfolk Sandbanks and Saturn Reef cSAC. On this basis, an Appropriate Assessment was not required.

Sandbanks

The Swarte bank is the closest sandbank to the proposed development, located approximately 6.5km north east of the Ensign location and the proposed development would be unlikely to impact the integrity of this sandbank feature.

Sabellaria spinulosa

The Saturn reef is situated approximately 6-12km south-east of the proposed development and pipeline and therefore it is unlikely to be affected by the proposed development activities. However, surveys undertaken of the development identified *Sabellaria spinulosa* aggregations in the vicinity of the proposed subsea well. Using the criteria developed by Gubbay (2007), concluded there were no aggregations that displayed 'reefiness' values that constituted potential Annex I habitat. However, at present there is no agreed methodology regarding the interpretation of Annex I habitat.

S. spinulosa is considered very sensitive to physical disturbance, however the duration of recovery from such disturbance and damage is still being disputed. Direct damage and disturbance would occur from the use of anchors and the installation of surface and subsea infrastructure and potential secondary impacts that may occur from oil and gas developments could be from the deposition of drill cuttings causing smothering.

No *S. spinulosa* aggregations were identified in the vicinity of the NPAI and the proposed installation of the pipeline is unlikely to have any impact on the identified aggregations as the pipeline is being laid in a SE direction from the identified *S. spinulosa* approximately 85m from the proposed subsea well. Modelling suggests that dispersion of drill cuttings will be dispersed in a south-easterly direction and unlikely to exceed a thickness of 2mm beyond 50m north of the drilling location and it unlikely that the aggregations of *S. spinulosa* would be

adversely affected.

Public Consultation: Comments were received from Hanson Marine Aggregates Ltd. as a result of the public consultation, but all comments were later retracted.

Consultee(s):

The statutory consultees for this project were JNCC and CEFAS. In addition, the MOD, Trinity House and the MCA were also consulted. The following comments were made:

JNCC: JNCC requested further clarification on the potential impacts on Annex 1 Habitats and cumulative impacts. Clarification was subsequently fully represented in an addendum to the ES and the further information provided by Centrica to JNCC's satisfaction and recommendation for consent was issued.

CEFAS: There are a number of fisheries restrictions within the vicinity of the proposed development. Restrictions regarding drilling between August and October to protect herring spawning were highlighted and it was recommended that Centrica undertake a herring spawning survey to ascertain if there was a potential for spawning in the area. A herring spawning survey has been undertaken and results conclude the area is unlikely to have a potential for herring spawning. The results of the survey will be included in subsequent environmental approvals. Recommendation for consent was issued.

Further Information: In addition to the consultee comments a number of issues were highlighted by DECC and further information was requested.

Centrica Energy provided the additional information requested and where appropriate acknowledged comments and committed to incorporating them in future submissions. All issues were considered satisfactorily amended and clarified.

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