

**TOTAL E&P UK Ltd**  
**LAGGAN-TORMORE DEVELOPMENT EAST OF SHETLAND**  
**Environmental Statement**

**To:** Wendy Kennedy

**From:** Evelyn Pizzolla

**Date:** May 2010

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| <b>ES Title:</b>           | <b>ISLAY DEVELOPMENT</b>    |
| <b>Operator:</b>           | <b>TOTAL E&amp;P UK Ltd</b> |
| <b>Consultants:</b>        | Xodus AURORA                |
| <b>Field Group (DECC):</b> | Aberdeen                    |
| <b>ES Report No:</b>       | D/4074/2010                 |
| <b>ES Date:</b>            | 14 April 2010               |
| <b>Block Nos:</b>          |                             |
| <b>Development Type:</b>   | Single well subsea tie-back |

**Project overview**

TOTAL is planning to develop the Islay field located in the northern North Sea, Block 3/15, approximately 160 km east of the Shetland Isles, and 5 km from the UK/Norway median line, to produce gas/condensate.

The Islay field will be developed as a subsea development. A single subsea well will be tied back via a 6 km gas and condensate pipeline to the Forvie subsea manifold which will direct production via the existing pipeline to the Alwyn North installation.

The development of the Islay field, originally known as Jura East, was included as a part of the Forvie and Jura Area Field Development, for which an umbrella ES was prepared and approved (2004). Islay has since been classified as a separate field and therefore, as determined by the Department of Energy and Climate Change (DECC), required a separate ES taking the form of a slim-line ES addendum with reference to the original umbrella ES prepared for the Forvie and Jura fields.

**Project Description**

**Overview Of The Forvie, Jura And Islay Developments**

The development of the Forvie and Jura gas/condensate fields has been undertaken in a number of phases between the years 2005 and 2008. As part of this development, five wells have already been drilled: Forvie North; Forvie Central; Jura 1; Jura 2; and Islay (formerly Jura East)

Wells 1, 3 and 4 are connected via 8" flowlines and control umbilicals to the Forvie manifold commingling gas and associated condensate through a 32 km 15" pipeline for processing at the Alwyn North B platform. Control of the wells and subsea facilities is provided by a 17.2 km hydro-electric and chemical umbilical link from the Dunbar platform to the Forvie manifold.

TOTAL drilled well number 5, as an exploration well in January 2008.

**The Islay Well**

In January 2008, total drilled a slightly deviated exploration well from a semi-submersible rig using only water based mud for all sections. Cuttings from the 36" section were discharge at the seabed; cuttings from deeper hole sections were circulated back to the drill rig and discharged into the water

column to ensure maximum dispersion and impact on seabed communities.

The primary objectives of the Islay well were:

- To assess the quality of the Brent reservoir on the Islay structure;
- To prove hydrocarbon presence, type and deliverability;
- In a success case, to assess the reservoir connectivity and to calibrate the flow rate.

Well evaluation was undertaken by examination of core samples; Vertical Seismic Profiling (VSP) (approved under PON14a 1640) and a well test using a permanent packer and a temporary drill stem test string. The well was perforated and a total of 2000 tonnes of hydrocarbons were flared over 25 days of testing, confirming a commercially viable well.

The well was therefore suspended in June 2008 and a horizontal christmas tree structure was installed at the well head ready for production. When the well is brought online the inhibited completion brine left in the well to protect against corrosion, scale formation and microbial activity, will be flowed back to the Alwyn North for disposal via produced water re-injection (PWRI).system.

The Dunbar installation will provide the Islay well with chemicals, subsea hydraulics and electrical power. However, ultimate control of the Islay well will come from the Alwyn North platform via the existing fibre optic cable to Dunbar.

### **Pipeline Route**

It was anticipated that the Islay field would be developed as a tie-back to the Jura manifold. However, a 2009 study showed that this was not feasible due to the need for a hydrate mitigation strategy that avoids full depressurisation of all linked fields, as this would result in large quantities of hydrocarbons being flared/vented. The pipeline design has to include strategic points where free liquid can accumulate for treatment with methanol.

Therefore, four routes were considered for tie-back to the Forvie manifold The selection process considered the degree of change required to the seabed profile (seabed conditioning) to ensure that the pipeline is free-draining towards these sump points. A detailed assessment concluded that the preferred route was the direct route running in a straight line and approximately 5.77 km in length. This route, reduces the requirements for seabed conditioning in the form of dredging and rock dumping (TOTAL, 2010), however, it does involve an overlap with the drilling rig anchor pattern associated with the Jura well and this compromise will have to be managed.

### **Seabed conditioning & Pipeline options**

A number of issues were examined in relation to the seabed conditioning requirements for the Islay pipeline, however, the precise requirements will be dependent on the type of pipeline selected, however, both options would require some degree of dredging; sleeper installation along the steep approach to the well, flexible mattresses at all tie-in spools and rock placement. Two options under consideration are either a towed 'bundle' of pipeline and umbilical in a 30" carrier line or a reel-laid conventional 6" diameter insulated production pipeline in a 10" carrier pipe with a separate 5" control umbilical. Additionally, the umbilical would need to be trenched and backfilled.

### **Key Environmental Sensitivities**

The EIA identified the following environmental sensitivities:

- Highest seabird vulnerability occurs in February, July and September
- Occurrences of cetaceans, including several species of whale and dolphin
- Fishing effort is moderate throughout the year
- Transboundary impacts

### **Key Potential Environmental Impacts**

The EIA identified the following potential environmental impacts:

- Seabed disturbance
- Physical presence causing disturbance to cetaceans and sea users
- Marine discharges
- Accidental hydrocarbon/chemical spills
- Underwater noise on cetaceans

### **Seabed disturbance**

The umbilical and production pipeline from the Islay well to the Forvie Manifold would be installed parallel to each other, approximately 20 m apart. The production pipeline will be partially laid on a rock carpet, with sleepers at the steep approach to the Islay well and with rock dump protection along its entire length. The umbilical will be trenched and backfilled along its entire length, as will the short section of methanol line between the Forvie pipeline end manifold (PLEM) and the Forvie Manifold. It is estimated that a 40 m wide corridor of seabed along the production pipeline and umbilical will be directly impacted by the installation operations. Mattressing will be required for protection where the umbilical and methanol line tie into the PLEMs, manifolds and mid-line methanol injection skid. An excavation along the 1.1 km section of the production pipeline route using a dredging vessel, is estimated to remove approximately 71,000 m<sup>3</sup> of seabed material. This will also have a direct impact on seabed habitats through the smothering of seabed fauna. The installation of the subsea structures including rock placement, mattressing, sleeper placement, trenching and dredging will all have a direct impact upon the seabed with a worst *case* estimate of 0.24 km<sup>2</sup> of seabed.

The area does not contain any Annex I seabed habitats. However, occasional seapens *Virgularia mirabilis* have been reported along the pipeline route but densities are too low to be considered as significant or representative of the habitat type.

There will be a localised loss of seabed habitat and mortality may be expected where rock is dumped, sleepers installed, mattresses laid and infrastructure installed. However the installation of these structures will introduce a new stable hard substrate and it is therefore expected that any epifaunal and encrusting animals present in the area will start to colonise the new seabed structures. Trenching will result in temporary habitat loss as backfilling will replace the substratum. There will be mortality of epifaunal species but recruitment by new individuals is expected to be rapid.

The dredging and disposal of seabed material during seabed preparation will potentially result in significant disturbance to the seabed. Further consultation will be carried out in conjunction with engineering teams, DECC and their advisors to determine the optimum location for disposal of this dredged material. Relevant permits and approval will be in place prior to any activity being carried out.

Benthic communities are in a constant state of flux and are able to adjust to disrupted conditions or rapidly re-colonise areas that have been disturbed. So it is expected that recovery will begin almost immediately after the pipeline, umbilical and infrastructure have been installed.

### **Physical presence**

The physical presence of a pipe-lay vessel and a rock placement vessel will present a collision risk to other sea users. Standard mitigation measures including Fisheries Liaison Officers, Notification to Mariners, guard vessels, a 500m exclusion zone, etc will be in place. A post pipe-lay survey to inform the Hydrographic office will be undertaken.

### **Marine discharges**

There will be no discharge to sea of suspension well fluids which will all be returned to the Alwyn North for disposal through the produced water re-injection system. However, pipeline commissioning chemicals will be discharged to the marine environment. The exact chemical suite to be used will be finalised during detailed design and will be the subject of a detailed risk assessment. The volumes of

chemicals to be discharged are low and will be rapidly dispersed by local currents so the expected environmental impact will be insignificant.

The produced water forecast for Islay is expected to contribute only 4.3% of total produced water in the Alwyn and as produced water is routinely reinjected the cumulative impact will be negligible.

#### **Accidental hydrocarbon/chemical spills**

The export pipeline will be transporting dry gas/condensate and therefore there is a low risk of a hydrocarbon spill from the line.

The installations vessels will carry diesel and marine heavy fuel oil, however, it is considered unlikely that a spill could occur but detailed spill prevention measures will be enforced. prior to operations commencing, a detailed Oil Pollution Emergency Plan (OPEP) will be submitted to the regulator for approval.

#### **Noise**

Noise generation from the Islay offshore activities will include, vessel movements, pipe-lay activities, and potential pile driving. These activities may have the potential to impact mainly upon cetaceans and seals. Pipelay and other vessels may make use of Dynamic Positioning (DP), involving the use of thrusters and therefore likely to result in increased noise levels. However, due to its offshore location and flat seabed in the area any marine mammal will be able to move away from the sound source

The Islay and Forvie PLEMs may be installed using piles. Through using recognised good practice such as the timing of operations to avoid sensitive periods, monitoring of mammals in the area and the use of soft starts (building noise levels up slowly to allow animals to move away), the residual noise impacts arising from potential piling operations should be insignificant.

#### **Transboundary effects**

The UK/Norwegian transboundary line is approximately 550 m from the Islay well and approximately 5 km from the Forvie Manifold. However the Islay development is not expected to result in any transboundary impacts: the seabed footprint of the subsea infrastructure and associated stabilisation material will not extend beyond the Islay and Forvie development area and a number of the impacts identified above will be limited and in some cases temporary.

In the case that a well intervention or workover is required, there could be potential transboundary disturbance to the seabed arising from the placement of anchors on the seabed from a drilling rig

The number of well interventions potentially required over the life of the well will be few, and the impacts would amount to minor and temporary seabed disturbance by one or two of the rig mooring anchors and chains extending over the UK/Norway transboundary line.

Environmental survey work has indicated that no seabed habitats or species that are currently considered sensitive in conservation terms occur in the area. In addition, relevant permits and approval will be in place prior to any activity being carried out. Therefore such impacts would be few in number, small in scale, temporary in nature and subject to rapid recovery, and overall are considered to be negligible.

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

**Consultee(s):**

The statutory consultees for this project were Marine Scotland (MS), and JNCC. They were requested to comment on the ES. The following comments were made:

Marine Scotland

Marine Scotland (MS) commented that in their opinion the impacts from the development and installation of the pipeline was well described.

MS had some concerns regarding dredging operations and the deposition of sediment and rock to manage the pipeline slope and the potential impacts this may have on the fishing industry. MS asked for confirmation that Total were in discussion with the relevant fishing organizations on their proposals. Total were able to confirm that there is an ongoing dialogue with the fisheries agencies.

MS requested copies of three final survey reports to be provided when available.

Overall, MS were content for the ES to receive approval.

JNCC:

JNCC considered that in general the ES provided a good description of the development, local environment and details of appropriate mitigation to minimise the effects of the activities on the receiving environment.

JNCC noted that Total had assumed a 'worst case' scenario associated with the installation of a separate pipeline and umbilical and asked Total to present an assessment of the potential impacts of the bundle option for comparison. Total provided this information and JNCC are satisfied that the ES has assessed a worst case.

JNCC noted Total had estimated a 20m corridor of impact either side of the pipeline installation and asked for clarification of this assumption. Total explained the basis of the assumption.

JNCC also asked if Total were continuing to liaise with DECC advisors and fisheries organisations regarding the potential for seabed conditioning and asked to be kept informed if there were significant changes to those proposals.

JNCC requested the final 2009 Fugro survey data to be provided when available.

On the basis of the information provided in the ES, the responses to requests for further information JNCC were content that the proposed pipe-lay operations were unlikely to have a significant environmental impact in the offshore marine environment..

**Further Information:**

No further information was requested.

**Conclusion(s):**

Following consultation, DECC and its consultees are satisfied that, with the implementation of mitigation measures in defined areas, 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.**

*Wendy Kennedy*

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*28 May 2010*

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**Date 28 May 2010**