# Beatrice Offshore Wind Farm Consent Plan

## Environmental Management Plan

October 2015

Beatrice
Offshore Windfarm Ltd

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| Project Title/ Location | Beatrice Offshore Wind Farm |
| Project Reference Number | LF0000005 |
| Date: | October 2015 |

# Beatrice Offshore Wind Farm

# Environmental Management Plan

Pursuant to 36 Consent Condition 15 and Marine Licence (Offshore Transmission Works) Condition 3.2.1.2

For approval of the Scottish Ministers



| Rev | Prepared By | Sign Off | Checked By | Sign Off | Approved By | Sign Off | Date of Issue |
|---|---|---|---|---|---|---|---|
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## Consent Plan Overview

**Purpose and Objectives of the Plan**

This Environmental Management Plan (EMP) has been prepared to address the specific requirements of the relevant conditions attached to Section 36 Consent and Marine Licences issued to Beatrice Offshore Windfarm Limited (BOWL).

The overall objective of the EMP is to provide the overarching framework for environmental management during the construction and operation of the Beatrice Offshore Wind Farm and Offshore Transmission Works (OfTW).

The EMP is designed to provide practical guidance to those involved in the Beatrice Project, including BOWL personnel, contractors and the BOWL Ecological Clerk of Works (ECoW), on management of the potential environmental impacts associated with the construction and operation of the Wind Farm and OfTW.

All BOWL personnel and contractors involved in the Beatrice Project must comply, as a minimum, with the mitigation and management measures and procedures presented in this EMP.

**Scope of the Plan**

The EMP covers, in line with the requirements of Section 36 and Marine Licence conditions, and in line industry standards and good practice, the following:

- The roles and responsibilities of key Project personnel with respect to environmental management;
- Mitigation measures to present significant adverse impacts to environmental interests,
- Pollution prevention measures;
- Chemical usage measures;
- Measures to prevent the introduction of marine non-native invasive species;
- Waste management measures;
- Mechanisms for reporting to the Scottish Ministers and stakeholders on environmental issues and compliance with the EMP.

**Structure of the Plan**

The EMP is structured as follows:

Sections 1 to 4 set out the scope and objectives of the EMP, provide an overview of the Project, set out broad statements of compliance and detail the process for making updates and amendments to this document.

Section 5 describes how the detail of the EMP will be communicated and implemented to those involved in the Project.

Sections 6 to 9 present a series of measures to mitigate or manage environmental impacts based on commitments made by BOWL and the requirements of consent and licence conditions.

Sections 10 to 14 set out measures to manage specific issues identified within consent and licence conditions, including marine pollution, chemical usage, invasive non-native species, waste, and dropped objects.

Annexes present a number of registers, proformas and procedures, which are intended to support the application of measures set out in the EMP.

**Plan Audience**

This EMP is intended to be referred to by personnel involved in the construction and operation of the Beatrice Project, including BOWL personnel, Key Contractors and Subcontractors. All method statements and environmental management documents produced in relation to the Project must comply with this EMP.

Compliance with this EMP will be monitored by the BOWL Consents and Licensing Team, the BOWL ECoW, and the Marine Scotland Licensing and Operations Team.

**Plan Locations**

Copies of this EMP are to be held in the following locations:

- BOWL Head Office;

- At the premises of any agent, Key Contractor or Subcontractor acting on behalf of BOWL;

- All site offices dealing with marine operations;

- The BOWL Marine Coordination Centre at Wick; and- With the ECoW(s).

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**List of Abbreviations and Definitions**

| Term | Description |
|---|---|
| AC | Alternating Current. |
| ADP | ALARP Design Procedure. |
| AFS | Anti-fouling System. |
| ALARP | As Low As Reasonably Possible. |
| Application | The Application letters and Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 and Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013. |
| Archaeological Consultant | Specialist archaeologists responsible for advising on all archaeological matters relating to the Project that might impact on archaeological and cultural heritage resources. |
| Awareness materials | Materials (e.g. posters, leaflets, etc.) used to raise awareness of EMP issues and requirements. |
| Audit | Inspection to confirm compliance, and identify and correct non-compliance. |
| BOWL | Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ. |
| CaP | The Cable Plan as required for approval under Condition 19 of the S36 consent and Condition 3.2.2.10 of the OfTW Marine Licence |
| CDM | Construction (Design and Management). |
| CFMS | The Commercial Fisheries Mitigation Strategy as required for approval under Condition 32 of the S36 consent and Condition 3.2.1.4 of the OfTW Marine Licence |
| CFWG | Commercial Fisheries Working Group. |
| CIP | Copenhagen Infrastructure Partners. |
| CLT | Consents and Licensing Team (BOWL). |
| CMS | The Construction Method Statement as required for approval under S36 Consent Condition 11 and OfTW Marine Licence Condition 3.2.2.4. |
| Commencement | The date on which Construction begins on the site of the Wind Farm or the |

| Term | Description |
|---|---|
| of the Wind Farm/OfTW | OfTW (as appropriate) in accordance with the S36 Consent or OfTW Marine Licence (as appropriate). |
| Commitments Register | A register that sets out all commitments to manage and mitigate potential environmental impacts made by BOWL. |
| the (S36) Consent | The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014. |
| Consent Conditions | The terms that are imposed on BOWL under the S36 or Marine Licence Consent that must be fulfilled throughout the period that the Consent is valid. |
| Construction | As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004. |
| CoP | Construction Programme as required for approval under Condition 10 of the s36 consent and Condition 3.2.2.3 of the OfTW Marine Licence |
| DECC | Department of Energy and Climate Change. |
| Development | The Wind Farm and the OfTW. |
| Diadromous fish | Fish species that migrate between fresh and salt water. |
| ECoW | Ecological Clerk of Works as required for approval under Condition 30 of the s36 consent and Condition 3.2.2.12 of the OfTW Marine Licence |
| EIA | Environmental Impact Assessment. |
| EMF | Electromagnetic fields. |
| EMP | The Environmental Management Plan as required for approval under Condition 15 of the s36 consent and Condition 3.2.1.2 of the OfTW Marine Licence |
| EPCI | Engineering Procurement Construction Installation. |
| EPS | European Protected Species. |
| ERCoP | The Emergency Response Co-operation Plan as required as part of the NSP |
| ES | The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above. |
| FID | Financial Investment Decision |

| Term | Description |
|---|---|
| FLO | The Fisheries Liaison Officer as required for approval under Condition 33 of the S36 consent and Condition 3.2.2.13 of the OfTW Marine Licence |
| gT | Gross Tonnes. |
| HSE | Health and Safety Executive. |
| IEMA | Institute of Environmental Management and Assessment. |
| IMO | International Maritime Organisation. |
| Inter-array cables | The AC electrical cables that connect the WTGs to the OTMs. |
| Induction | Formal introduction to the BOWL Project and associated safety, health and environmental requirements. |
| INNS | Invasive Non Native Species. |
| ISO | International Organisation for Standardisation. |
| JNCC | Joint Nature Conservation Committee. |
| Key Contractors | The Contractors appointed for the individual work packages of Marine Installation; Transmission; and WTGs |
| KPIs | Key Performance Indicators. |
| Landfall site | The point above MHWS near Portgordon, where the OfTW cable connects to the OnTW. |
| Licencing Authority | The Scottish Ministers |
| Licensee | Beatrice Offshore Windfarm Limited, a company registered in Scotland having its registered number as SC350248. |
| LMP | Lighting and Marking Plan. |
| Marine Co-ordination | The management and surveillance of people, vessels and offshore structures to ensure the safe preparation and execution of offshore activities, in order to minimise the probability of an incident, and to provide effective response if an incident does occur. |
| Marine Licences | The written consents granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which were issued on 2 September 2014. |

| Term | Description |
|---|---|
| MCA | Maritime and Coastguard Agency. |
| MFRAG | Moray Firth Regional Advisory Group. A group yet to be formed, responsible for overseeing monitoring and mitigation on a regional scale, set up by the Scottish Ministers. |
| MHWS | Mean High Water Springs. |
| MMO | Marine Mammal Observer or Marine Management Organisation |
| MORL | Moray Offshore Renewables Ltd. |
| MPCP | The Marine Pollution Contingency Plan as required for approval under Condition 3.1.12 of the Wind Farm/OfTW Marine Licences |
| MS-LOT | Marine Scotland Licensing and Operations Team. |
| NLB | Northern Lighthouse Board. |
| NSP | The Navigational Safety Plan as required for approval under Condition 18 of the S36S36 consent and Condition 3.2.2.9 of the OfTW Marine Licence |
| O&M | Operation and Maintenance. |
| OCM | Offshore COSHH Method. |
| OfTW | The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast. |
| OHSAS | Occupational Health and Safety Advisory Services. |
| OMP | The Operation and Maintenance Plan as required for approval under S36 condition 17 and OfTW Marine Licence condition 3.2.3.2 |
| OnTW | The onshore transmission works from landfall, consisting of onshore buried export cables to the onshore substation and connection to the National Grid network. |
| On-site | On-site means within the boundaries of the Wind Farm and OfTW as defined within the Section 36 Consent and the Marine Licences. |
| OTM | Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator. |
| PAD | The Protocol for Archaeological Discoveries as required for approval |

| Term | Description |
|---|---|
| | under Condition 37 of the S36 consent and Condition 3.2.2.16 of the OfTW Marine Licence |
| PAM | Passive Acoustic Monitoring. |
| PEMP | The Project Environmental Monitoring Programme as required for approval under S36 Consent Condition 27 and OfTW Marine Licence Condition 3.2.1.1 |
| PON | Petroleum Operations Notice. |
| PS | The Piling Strategy as required for approval under Condition 12 of the S36 consent and Condition 3.2.2.5 of the OfTW Marine Licence |
| ROV | Remotely Operated Vehicle. |
| RSPB Scotland | Royal Society for the Protection of Birds, Scotland |
| SAC | Special Area of Conservation. |
| SAH | Significant Accident Hazard. |
| SEAR | Safety and Environmental Awareness Report |
| SEIS | The Supplementary Environmental Information Statement submitted to the Scottish Ministers by the Company on 29 May 2013 as part of the Application as defined above. |
| SEPA | Scottish Environment Protection Agency. |
| SHE | Safety, Health and Environment. |
| Site | The area outlined in red in Figure 1 attached to the (S36) Consent Annex 1 and the area outlined in red and the area outlined in black in the figure contained in Part 4 of the (OfTW) Marine Licence. |
| Site inspection | Inspections by Marine Scotland Licensing and Operations Team to monitor ongoing compliance with the EMP. |
| SNH | Scottish Natural Heritage. |
| Soft start piling | The gradual increase of piling power, incrementally over a set time period, until full operational power is achieved. |
| SPA | Special Protection Area, protected sites classified in accordance with Article 4 of the EC Birds Directive. |
| SSE | Scottish and Southern Energy. |

| Term | Description |
|---|---|
| SSSI | Site of Special Scientific Interest, areas of land and water designated under the Nature Conservation (Scotland) Act 2004. |
| Subcontractor | Subcontractors to the Key Contractors. |
| Toolbox talk | A short presentation given to Project team members on an aspect of environmental management. |
| Training records | Records to demonstrate that required training has been provided. |
| VMP | The Vessel Management Plan as required for approval under Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence |
| Wind Farm | The offshore array development as assessed in the ES including wind turbines, their foundations, inter-array cabling and meteorological masts. |
| WSI | Written Scheme of Investigation, which establishes the mitigation procedures that must be followed in order to avoid damage to cultural heritage assets and targets of archaeological potential for the entire scope of the Project. The WSI sets out the respective responsibilities of BOWL, the Contractor, and the Archaeological Consultant prior to and during installation, and creates formal lines of communication between the parties and relevant stakeholders. |
| WTG | Wind Turbine Generator. |

# 1 Introduction

## 1.1 Background

1.1.1 The Beatrice Offshore Wind Farm received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 19 March 2014 (the S36 Consent) and was granted two Marine Licences from the Scottish Ministers, for the Wind Farm and associated Offshore Transmission Works (OfTW), on 2nd September 2014 (the Marine Licences).

## 1.2 Objectives of this Document

1.2.1 The S36 Consent and Marine Licences contain a variety of conditions that must be discharged through approval by the Scottish Ministers/Licensing Authority prior to the commencement of any offshore construction works. One such requirement is the approval of an **Environmental Management Plan (EMP)**, the purpose of which is to provide the over-arching framework for on-site environmental management during construction and operation of the Development (but excluding decommissioning). The relevant conditions setting out the requirement for an EMP for approval, and which are to be discharged by this EMP, are presented in full in Table 1.1.

1.2.2 This EMP is intended to satisfy the requirements of the S36 Consent and Marine Licence (OfTW) conditions by setting out the proposed Project-specific of environmental management framework and procedures that will be followed by all Key Contractors and Subcontractors during the construction and operation of the Beatrice Offshore Wind Farm. It sets out the principles that will be applied by key contractors and subcontractors in formulating their own plans and by which the commitments made by BOWL in respect of environmental management and mitigation will be practically implemented by BOWL personnel, Key Contractors and Subcontractors during construction (and operation) to prevent significant adverse impacts to environmental interests.

1.2.3 In line with the requirements of the S36 Consent and Marine Licence conditions, this document focuses on environmental management during construction, and will be updated prior to the final commissioning of the Development to focus on environmental management during the operation and maintenance phase.

**Table 1.1 - EMP consent conditions to be discharged by this document**

| Ref. | Condition Text | Where Addressed |
|---|---|---|
| S36 Consent Condition 15 | The Company must, no later than 6 months prior to the Commencement of the Wind Farm, submit an Environmental Management Plan ("EMP"), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with the JNCC, SNH, SEPA, RSPB Scotland and any such other advisors or organisations as may be required at the discretion of the | This document sets out the EMP for approval by the Scottish Ministers |

| Ref. | Condition Text | Where Addressed |
|---|---|---|
| | Scottish Ministers. | |
| | The Wind Farm must, at all times, be constructed and operated in accordance with the approved EMP (as updated and amended from time to time by the Company). | Section 3.0 (BOWL Statements of Compliance)<br>Section 5.8 (auditing) |
| | Any updates or amendments made to the EMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval. | Section 4.0 (updates and amendments) |
| | The EMP must provide the over-arching framework for on-site environmental management during the phases of development as follows:<br>a. all construction as required to be undertaken before the Final Commissioning of the Wind Farm; and<br>b. the operational lifespan of the Wind Farm from the Final Commissioning of the Wind Farm until the cessation of electricity generation. (Environmental management during decommissioning is addressed by condition 3). | This EMP, for approval by the Scottish Ministers, addresses construction and operational phases |
| | The EMP must be in accordance with the ES and SEIS as it relates to environmental management measures. | Section 6.0 (ES & SEIS commitments) |
| | The EMP must set out the roles, responsibilities and chain of command for the Company personnel, any Key Contractors or Subcontractors in respect of environmental management for the protection of environmental interests during the construction and operation of the Wind Farm. It must address, but not be limited to, the following overarching requirements for environmental management during construction | Section 5.4 (Roles, responsibilities and chain of command) |
| | • Mitigation measures to prevent significant adverse impacts to environmental interests, as identified in the ES and pre-consent and pre-construction surveys, and include the relevant parts of the CMS (refer to condition 11); | Section 7.0 (ES and SEIS commitments and monitoring)<br>The linkage to the CMS is set out in Section 1.4. |
| | • Pollution prevention measures and contingency plans; | Section 9 (pollution prevention) and Section 10 (chemical usage) |
| | • Management measures to prevent the introduction of invasive non-native marine species; | Section 11 (INNS) |
| | • Measures to minimise, recycle, reuse and dispose of waste streams; and | Section 12 (waste management) |
| | • The reporting mechanisms that will be used to provide the Scottish Ministers and relevant stakeholders (including, but not limited to, the JNCC, SNH, SEPA, RSPB Scotland, MCA and NLB) with regular updates on construction activity, including any environmental issues that have been encountered and how these have been addressed. | Section 5.6 (reporting) & Section 5.7 (incident reporting) |
| | The Company must, no later than 3 months prior to the Final Commissioning of the Wind Farm, submit an updated EMP, in writing, to cover the operation and maintenance activities for the Wind Farm to the Scottish Ministers for their written approval. Such approval may be given only following consultation with the JNCC, SNH, SEPA, RSPB Scotland and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. The EMP must be regularly reviewed by the Company and the MFRAG (referred to in condition 28) over the lifespan of the Wind Farm, and be kept up to date (in relation to the likes of construction methods and operations of the Wind Farm in terms of up to date working practices) by the Company in consultation with the | Section 4.0 (updates and amendments) |

| Ref. | Condition Text | Where Addressed |
|---|---|---|
| | MFRAG. | |
| | The EMP must be informed, so far as is reasonably practicable, by the baseline surveys undertaken as part of the ES and the PEMP. | Section 7.0 (ES and SEIS commitments and monitoring) |
| OfTW Marine Licence Condition 3.2.1.2 | The Licensee must, no later than 6 months prior to the Commencement of the OfTW, submit an EMP, in writing, to the Licensing Authority for their written approval. Such approval may only be granted following consultation by the Licensing Authority with the JNCC, SNH, SEPA and any such other advisors or organisations as may be required at the discretion of the Licensing Authority. | This document sets out the EMP for approval by the Licensing Authority |
| | The OfTW must, at all times, be constructed and operated in accordance with the approved EMP (as updated and amended from time to time by the Licensee). | Section 3.0 (BOWL Statements of Compliance)<br>Section 5.8 (auditing) |
| | Any updates or amendments made to the EMP by the Licensee must be submitted, in writing, by the Licensee to the Licensing Authority for their written approval. | Section 4.0 (updates and amendments) |
| | The EMP must provide the over-arching framework for on-site environmental management during the phases of works as follows:<br>a. all construction as required to be undertaken before the Final Commissioning of the OfTW; and<br>b. the operational lifespan of the OfTW from the Final Commissioning of the OfTW until the cessation of electricity transmission (Environmental management during decommissioning is addressed by condition 3.2.2.2). | This EMP, for approval by the Licensing Authority addresses construction and operational phases |
| | The EMP must be in accordance with the Application as it relates to environmental management measures. | Section 7.0 (ES and SEIS commitments) |
| | The EMP must set out the roles, responsibilities and chain of command for the Licensee personnel, any Key Contractors or Subcontractors in respect of environmental management for the protection of environmental interests during the construction and operation of the OfTW. It must address, but not be limited to, the following over-arching requirements for environmental management during construction: | Section 5.4 (Roles, responsibilities and chain of command) |
| | Mitigation measures to prevent significant adverse impacts to environmental interests, as identified in the Application and pre-consent and pre-construction surveys, and include the relevant parts of the Construction Method statement ("CMS"); | Section 7.0 (ES and SEIS commitments and monitoring)<br>The linkage to the CMS is set out in Section 1.4. |
| | a. Pollution prevention measures and contingency plans; | Section 9 (pollution prevention) and Section 10 (chemical usage) |
| | b. Management measures to prevent the introduction of marine non-native marine species; | Section 11 (INNS) |
| | c. Measures to minimise, recycle, reuse and dispose of waste streams; and | Section 12 (waste management) |
| | d. The reporting mechanisms that will be used to provide the Licensing Authority and relevant stakeholders (including, but not limited to, the JNCC, SNH, SEPA, Maritime and Coastguard Agency ("MCA") and the Northern Lighthouse Board ("NLB")) with regular updates on construction activity, including any environmental issues that have been encountered and how these have been addressed. | Section 5.6 (reporting) & Section 5.7 (incident reporting) |
| | e. The Licensee must, no later than 3 months prior to the Final | Section 4.0 (updates and |

| Ref. | Condition Text | Where Addressed |
|---|---|---|
| | Commissioning of the OfTW, submit an updated EMP, in writing, to cover the operation and maintenance activities for the OfTW to the Licensing Authority for their written approval. Such approval may be given only following consultation with the JNCC, SNH, SEPA and any such other advisors or organisations as may be required at the discretion of the Licensing Authority. The EMP must be regularly reviewed by the Licensee and the MFRAG (refer to conditions 3.2.2.18 and 3.2.3.10) over the lifespan of the OfTW, and be kept up to date (in relation to the likes of construction methods and operations of the OfTW in terms of up to date working practices) by the Licensee in consultation with the MFRAG. | amendments) |
| | The EMP must be informed, so far as is reasonably practicable, by the baseline surveys undertaken as part of the Application and the PEMP. | Section 7.0 (ES and SEIS commitments and monitoring) |

1.2.4 In addition to the specific consent requirements for an EMP and the requirements thereof (as set out in Table 1.1), this EMP also includes information in respect of a number of other conditions within the Project consents which are linked to the matter of environmental management; these are set out in Table 1.2; reference to where matters are addressed in this EMP are given.

**Table 1.2 - Other consent conditions relevant to this EMP**

| Reference | Summary of condition | Where addressed |
|---|---|---|
| Section 36 Condition 9 | As far as reasonably practicable, the Company must, on being given reasonable notice by the Scottish Ministers (of at least 72 hours), provide transportation to and from the Site for any persons authorised by the Scottish Ministers to inspect the Site. | Section 5.6 (Auditing) |
| Wind Farm/OfTW Marine Licence Condition 3.1.3 | Should the Licensee or any of their agents, Key Contractors or Subcontractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify the Licensing Authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the Licensing Authority is obliged to immediately report force majeure incidents to the Convention Commission. | Section 13 (Dropped objects) |
| Wind Farm/OfTW Marine Licence Condition 3.1.8 (Partial) | All reasonable, appropriate and practicable steps must be taken to minimise damage to the Scottish marine area and the UK marine licensing area. | This EMP, for approval by the Licensing Authority, incorporating the requirements of the ES/SEIS and consents |
| | Any debris or waste material placed below MHWS during construction and operation must be removed for disposal above MHWS as approved by SEPA. | Section 12 (Waste management) |

| Reference | Summary of condition | Where addressed |
|---|---|---|
| | All substances and objects deposited during the execution of the Wind Farm/OfTW must be inert (or appropriately coated or protected so as to be rendered inert) and must not contain toxic elements. | Section 9 (pollution prevention and contingency planning) |
| | The risk of transferring marine non-native species to and from the Site must be kept to a minimum by ensuring appropriate bio-fouling management practices are implemented. | Section 11 (INNS) |
| S36 Consent Condition 30<br>OfTW Marine Licence Condition 3.2.2.12 | The responsibilities of the ECoW must include: quality assurance of all plans and programmes; provision of advice on compliance with consent conditions; monitoring compliance; providing compliance reports to the Scottish Ministers; and inducting site personnel on environmental policy and procedures. | Section 5.4 (roles/responsibility), Section 5.5 (training), Section 5.6 (reporting), Section 5.8 (auditing) and throughout EMP. |
| Wind Farm/OfTW Marine Licence Condition 3.1.9 | The Licensee must ensure that copies of this licence are available for inspection by any authorised marine enforcement officer at:<br>a) the premises of the Licensee;<br>b) the premises of any agent, contractor or sub-contractor acting on behalf of the Licensee;<br>c) any onshore premises directly associated with the Wind Farm/OfTW; and<br>d) aboard any vessel engaged in the Wind Farm/OfTW. | Section 5.9 (EMP document control) |
| Wind Farm/OfTW Marine Licence Condition 3.1.10 | Any persons authorised by the Licensing Authority must be permitted to inspect the Wind Farm/OfTW at any reasonable time.<br>BOWL must provide transportation to and from the Site on reasonable notice of at least 72 hours. | Section 5.6 (Auditing) |
| Wind Farm Marine Licence Condition 3.2.2.1<br>OfTW Marine Licence Condition3.2.3.3 | The Licensee must create, complete and submit to the Licensing Authority on the first working day of the month, a detailed transportation audit sheet for each month during the period when construction of the Wind Farm/OfTW is undertaken, for all aspects of the construction of the Wind Farm/OfTW. The transportation audit sheet must include information on the loading facility, vessels, equipment, shipment routes, schedules and all materials to be deposited (as described in Part 2 of this licence) in that month. Where, following the submission of a transportation audit sheet to the Licensing Authority, any alteration is made to the component parts of the transportation audit sheet, the Licensee must notify the Licensing Authority of the alteration in the following month's transportation audit sheet.<br>If the Licensee becomes aware of any substances or objects on the transportation audit sheet that are missing, or an accidental deposit occurs, the Licensee must contact the Licensing Authority as soon as practicable after becoming aware, for advice on the appropriate remedial action. Should the Licencing Authority deem it necessary, the Licensee must undertake a side scan sonar survey in grid lines (within operational and safety constraints) across the area of the Wind Farm/OfTW, to include cable routes and vessel access routes from local service port(s) to the Site to locate the substances or objects. If the Licensing Authority is of the view that any accidental deposits associated with the construction of the Wind Farm/OfTW are present, then the deposits must be removed by the Licensee as soon as is practicable and at the Licensee's expense. | Section 13 (Dropped objects)<br>The Transportation Audit Sheet template will be provided separately for approval.<br>See also Section 5.6, Table 5.3 (reporting) |

1.2.5 BOWL would also highlight that this EMP sets out an overview of relevant environmental management measures. Specific further detail is provided in other Consent Plans that are required by other conditions set out in the Project consents and will be provided for approval in seeking to discharge those conditions. As such, an overview is provided in this EMP with appropriate cross referencing to those other relevant plans.

1.2.6 For example, for marine pollution prevention and contingency planning, the framework is provided in Section 9 of this EMP but further details will be presented in the Marine Pollution Contingency Plan (MPCP) required under Condition 3.1.12 of the Wind Farm/OfTW Marine Licences. The detail in the MPCP will require to be approved by Scottish Ministers as part of the discharge of that condition, in advance of commencement of construction.

1.2.7 A further overview of the linkages between this EMP and the other Consent Plans is presented in Section 1.4 below.

### 1.3 Structure of this EMP

1.3.1 This EMP is divided into the following sections:

| Section | | Summary of Content |
|---|---|---|
| 1 | Introduction | Background to consent requirements and overview of the EMP scope and structure; and<br>Identifies those other Consent Plans relevant to the environmental management process and the linkage between those plans and the EMP. |
| 2 | Project Description | Provides an overview of the Beatrice Offshore Wind Farm development and an overview of the construction program key milestone dates. |
| 3 | BOWL Statements of Compliance | Sets out the BOWL statements of compliance in relation to the EMP consent conditions and the broader environmental management process. |
| 4 | Updates and Amendments to this EMP | Sets out the procedures for any required updating or amending the approved EMP and subsequent further approval by the Scottish Ministers. |
| 5 | Environmental Management Framework | Describes the environmental management framework for the Development. It provides information on the implementation and communication of the EMP. |
| 6 | Environmental Management and Mitigation Measures Identified in the Application | Reviews the environmental management and mitigation requirements identified in the original application, ES and SEIS and how these are reflected in the environmental management measures set out in this EMP or other Consent Plans. |
| 7 | Environmental Management and Mitigation of Effects on | Sets out key mitigation and management measures to mitigate or manage effects on the natural environment. |

| Section | | Summary of Content |
|---|---|---|
| | the Marine Animals | |
| 8 | Environmental Management and Mitigation of Effects on Marine Archaeology | Sets out key mitigation and management measures to mitigate or manage effects on marine archaeology. |
| 9 | Environmental Management and Mitigation of Effects on Other Marine Users | Sets out key mitigation and management measures to mitigate or manage effects on other marine users. |
| 10 | Pollution Prevention and Contingency Planning | Sets out pollution prevention and contingency planning measures (from the MPCP). |
| 11 | Chemical Usage | Sets out chemical usage measures (from the MPCP). |
| 12 | Invasive Non-Native Marine Species | Sets out the measures to be adopted to prevent the introduction of invasive non-native species. |
| 13 | Waste Management | Sets out the waste management framework to be adopted and implemented throughout the construction phase and operational life of the Development. |
| 14 | Dropped Objects | Sets out the procedures to be followed in the event of a dropped object or accidental deposit being made. |
| Annexes 1 - 3 | Registers | EMP Contacts Directory, Commitments Register and Legislation Register. |
| Annexes 4 - 8 | Procedures and Proformas | Waste management measures, environmental incident reporting workflow, dropped objects notification pro-forma and ECoW reporting template. |

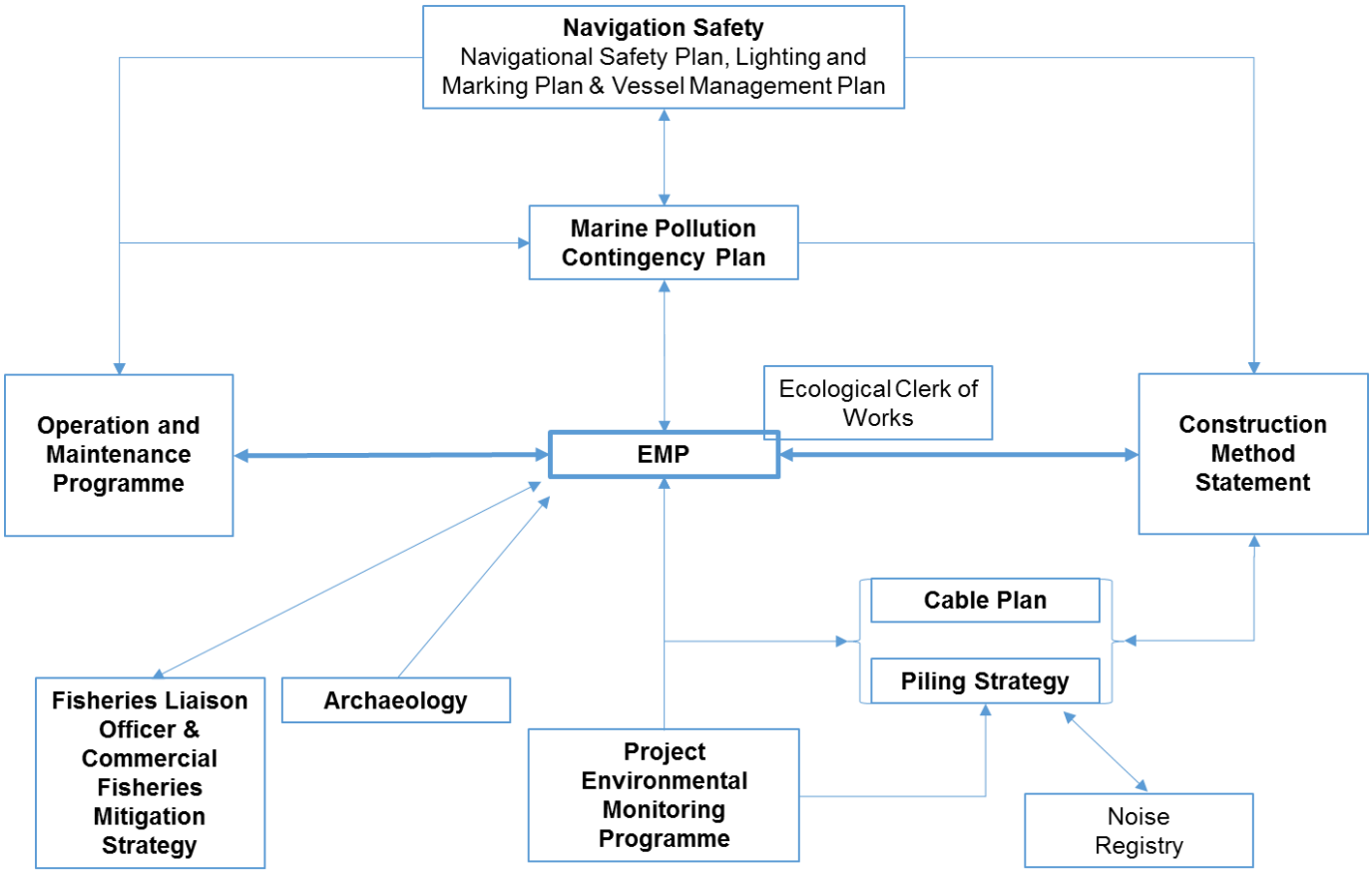
## 1.4 Linkages with other Consent Plans

1.4.1 This EMP document sets out, for approval, the proposed overarching environmental management framework to be applied during the construction and operation of the Project. However, ultimately it will form part of a suite of approved documents that will provide the framework for management of the Project – namely the other Consent Plans required under the Section 36 and Marine Licences.

1.4.2 Indeed Condition 15 of the S.36 Consent and Condition 3.2.1.2 of the OfTW Marine Licence (see Table 1.1 above) requires this EMP to incorporate relevant parts of the CMS, and also to be informed by monitoring conducted under the PEMP.

1.4.3 Figure 1.1 summarises the linkages between other Consent Plans (and consent conditions) that have some overlap with the EMP in terms of both construction methodology and operational procedures, and the mitigation and management of the potential environmental effects that might arise from either phase.

**Figure 1.1 – Indicative linkages between the EMP and other BOWL Consent Plans (or consent conditions) in relation to environmental management and mitigation**




1.4.4 The linkages between these various Consent Plans (and other related consent conditions) and the EMP are set out in Table 1.3 below.

**Table 1.3 – EMP linkages with other relevant Consent Plans (and consent conditions)**

| Other Consent Plan | Linkage with EMP | Other Relevant Consent Conditions | Relevant EMP Section |
|---|---|---|---|
| The navigational safety plan (NSP) (required under Condition 18 of the S36S36 consent and Condition 3.2.2.9 of the OfTW Marine Licence); | Sets out the navigational safety measures to be applied for the Project including matters related to marine co-ordination, safety zones, routeing, anchorages and notifications and communications for other sea users. Also sets out emergency response procedures. | Wind farm ML 3.2.1.3 & OfTW 3.2.2.14 – navigational charting<br><br>Wind farm ML 3.2.2.3 and 3.2.3.2 & OfTW 3.2.3.5 and 3.2.4.5 - | Overview provided in Section 8.0 |

| Other Consent Plan | Linkage with EMP | Other Relevant Consent Conditions | Relevant EMP Section |
|---|---|---|---|
| | | navigational safety – notifications<br><br>Wind farm ML 3.2.2.5 & OfTW 3.2.3.7 - marking of lighting of vessels | |
| The lighting and marking plan (LMP) (required under Condition 20 of the S36 consent and Condition 3.2.2.14 of the OfTW Marine Licence) | Provides details of lighting and marking of the Wind Farm structures during construction is provided in the LMP. | Wind farm ML 3.2.2.4 and 3.2.3.4 and OfTW 3.2.3.6 and 3.2.4.6 - marking and lighting | Overview provided in Section 8.0 |
| The vessel management plan (VMP) (required under Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence) | The VMP will consider the management and coordination of vessels. | | Overview provided in Section 7.0 |
| The Marine Pollution Contingency Plan (required under Condition 3.1.12 of the Wind Farm/OfTW Marine Licences) | The MPCP sets out the procedures to be followed in the event of a marine pollution incident. It also deals with chemical usage. | Wind farm & OfTW ML 3.1.7 – chemical usage<br><br>Wind farm 3.2.2.7 & OfTW ML 3.2.1.6– bunding and storage facilities | Overview provided in Section 9.0 |
| The cable plan (CaP) (required under Condition 19 of the S36 consent and Condition 3.2.2.10 of the OfTW Marine Licence) | Provides detailed specification of the cables, their installation, burial and/or protection. | | Overview provided in Section 7.0 |
| The piling strategy (PS) (required under Condition 12 of the S36 consent and Condition 3.2.2.5 of the OfTW Marine Licence) | The PS contains detail on how the piling methods and programme have been developed to reduce effects on noise sensitive species. | Wind farm ML 3.2.1.5 and 3.2.2.6 and 3.2.3.5 - Noise registry<br>(see also linkages to PEMP herring and marine | Overview provided in Section 7.0 |

| Other Consent Plan | Linkage with EMP | Other Relevant Consent Conditions | Relevant EMP Section |
|---|---|---|---|
| | | mammal monitoring) | |
| Project Environmental Monitoring Plan (PEMP) (required by S36 Consent Condition 27 and OfTW Marine Licence Condition 3.2.1.1.) | The purpose of the PEMP is to set out measures by which BOWL will monitor the environmental impacts of the Development. BOWL environmental management, mitigation and monitoring commitments will take account of the results of the ongoing programme of pre-, during and post-construction monitoring described in the PEMP. | S36 consent condition 34 Herring surveys – linkage to PS and piling mitigation<br>S36 consent conditions 35 and 36 - cod and sand eel surveys-<br>Wind farm ML 3.2.1.4 – monitoring of marine mammals (linked to piling activity) | Overview provided in Section 6.4 |
| The Construction Method Statement (CMS) (required by S36 Consent Condition 11 and OfTW Marine Licence Condition 3.2.2.4.) | The purpose of the CMS is to detail the methods that will be implemented during the construction of the Development, setting out good practice construction measures and how mitigation measures proposed in the ES and SEIS (as captured within this EMP) will be implemented during construction. The EMP will be adhered to during construction of the Development. | | Overview provided in Section 6.0 (ES/SEIS commitments) and also Section 3.6 (good working practices). |
| Operations and Maintenance Programme (OMP) (Required under S36 condition 17 and OfTW Marine Licence condition 3.2.3.2) | The OMP sets out the procedures and good working practices for the operational and maintenance (O&M) phase of the Development, considering environmental sensitivities. | | This EMP will be updated for the operational phase (see Section 4.2) to reflect details in the OMP |
| Commercial Fisheries Mitigation Strategy (CFMS) (required under Condition 32 of the S36 consent and Condition 3.2.1.4 of the OfTW Marine Licence) | Sets out the mitigation strategy relating to the commercial fishing industry in order to minimise or avoid effects on fishing. | | Overview provided in Section 8.0 |
| ECoW (Required by S36 condition 30 and | Sets out the identity, roles and responsibilities of the | | This EMP sets out the role of the ECoW in |

| Other Consent Plan | Linkage with EMP | Other Relevant Consent Conditions | Relevant EMP Section |
|---|---|---|---|
| OfTW Marine Licence condition 3.2.2.12) | offshore ECoW | | relation to this EMP e.g. Section 5.4 (roles/ responsibility), Section 5.5 (training), Section5.6 (reporting), Section 5.8 (auditing) and throughout. |
| Fisheries Liaison Officer (FLO) (required under Condition 33 of the S36 consent and Condition 3.2.2.13 of the OfTW Marine Licence) | Sets out the identity, roles and responsibilities of the FLO | | Overview provided in Section 8.0 |
| Archaeological reporting protocol (required under Condition 37 of the S36 consent and Condition 3.2.2.16 of the OfTW Marine Licence) | Sets out the reporting protocol in the event of marine archaeological discoveries being made prior to, during or following construction of the Project | | Overview provided in Section 7.0 |

# 2 Project Description

## 2.1 Overview

2.1.1 Figure 2.1 shows the location of the Development in the Moray Firth. The Development will consist of the following main components:

- A total generating capacity of up to 588MW;
- Up to 84 wind turbines of 7MW rated generating capacity;
- Jacket foundations each installed on four piles driven into the seabed;
- Two AC substation platforms, referred to as offshore transformer modules (OTMs) to collect the generated electricity and convert the electricity from 33kV to 220kV for transmission to shore;
- A network of circa 170 to 190km of inter-array, buried, subsea cables to connect strings of turbines together and to connect the turbines to the OTMs;
- 2 buried, subsea export cables, totalling circa 130km in length, to transmit the electricity from the OTMs to the land fall at Portgordon and connecting to the onshore buried export cables for transmission to the onshore substation and connection to the National Grid network; and
- Minor ancillary works such as the deployment of met buoys and aids to navigation.

2.1.2 Figure 2.2 shows the final layout of the Wind Farm.

## 2.2 Key Construction Programme Milestones

2.2.1 Details of the construction programme are provided in the Construction Programme (CoP) submitted for approval (required under Condition 10 of the S36 Consent and Condition 3.2.2.3 of the OfTW Marine Licence).

2.2.2 For ease of reference the key milestone dates for the offshore construction works are provided in Table 2.1.

**Table 2.1 - Summary of key milestone dates**

| Milestone | Anticipated Programme |
|---|---|
| Wind Farm | |
| Commencement of Wind Farm | April 2017 |
| Mobilisation of Plant, Delivery of Materials to Onshore Laydown Areas (where required) | To match installation timings as set out below<br>Onshore laydown of wind turbine components over the period from Q1 2018 and throughout the turbine installation period. |
| Timing and Sequencing of Construction Work | Pile Foundations:<br>• April - November 2017<br>• April - September 2018<br>• (Installation December 2017 – March 2018 possible but unlikely)<br>Jackets:<br>• May - September 2017<br>• April – September 2018<br>Wind turbines:<br>• June - September 2018<br>• April – August 2019<br>Inter-array Cables:<br>• July - September 2017<br>• April - October 2018<br>• April – June 2019 |
| Final Commissioning of Wind Farm | October 2019 |
| OfTW | |
| Commencement of OfTW | April 2017 |
| Mobilisation of Plant and Delivery of Materials | To match installation timings as set out below |
| Timing and Sequencing of Construction Work | Pile Foundations:<br>• April 2017<br>Jackets:<br>• September 2017<br>OTM Topsides:<br>• April 2018<br>Export Cables:<br>• July – October 2017<br>• March – June 2018 |
| Final Commissioning of OfTW | October 2019 |

2.2.3 It is currently anticipated that the offshore construction works will take place:

- Primarily during the spring – autumn period (i.e. between April and October/November); and
- Around the clock i.e. 24 hour working, 7 days a week unless noted otherwise.

2.2.4 Note that where piles are installed and left at the seabed for a period of time before the jackets are then installed, suitable provision will be made to ensure the safety of marine navigation and commercial fishing – see Section 9.0 of this EMP (and the LMP and NSP).

**Figure 2.1 - Beatrice Wind Farm and OfTW location**

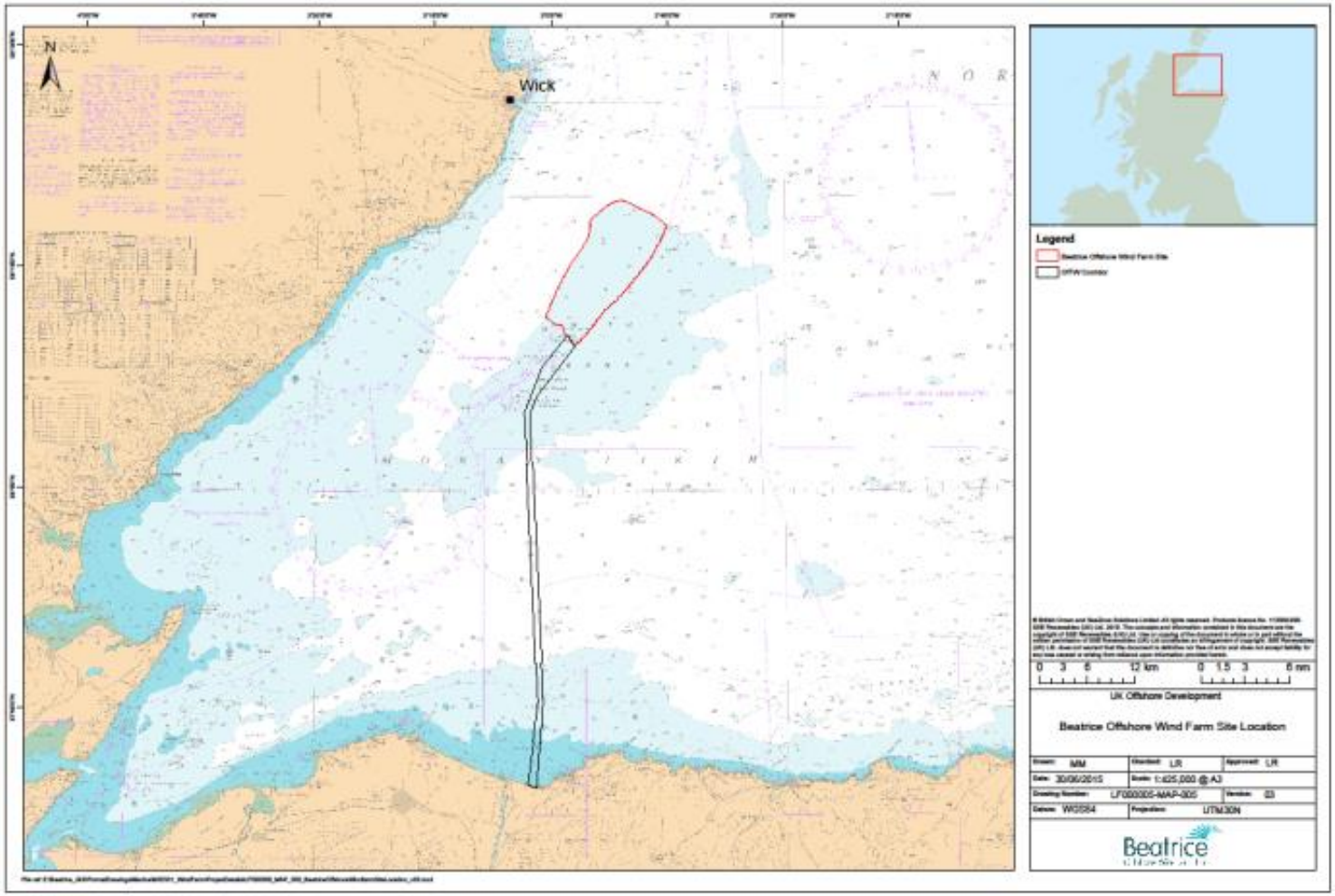
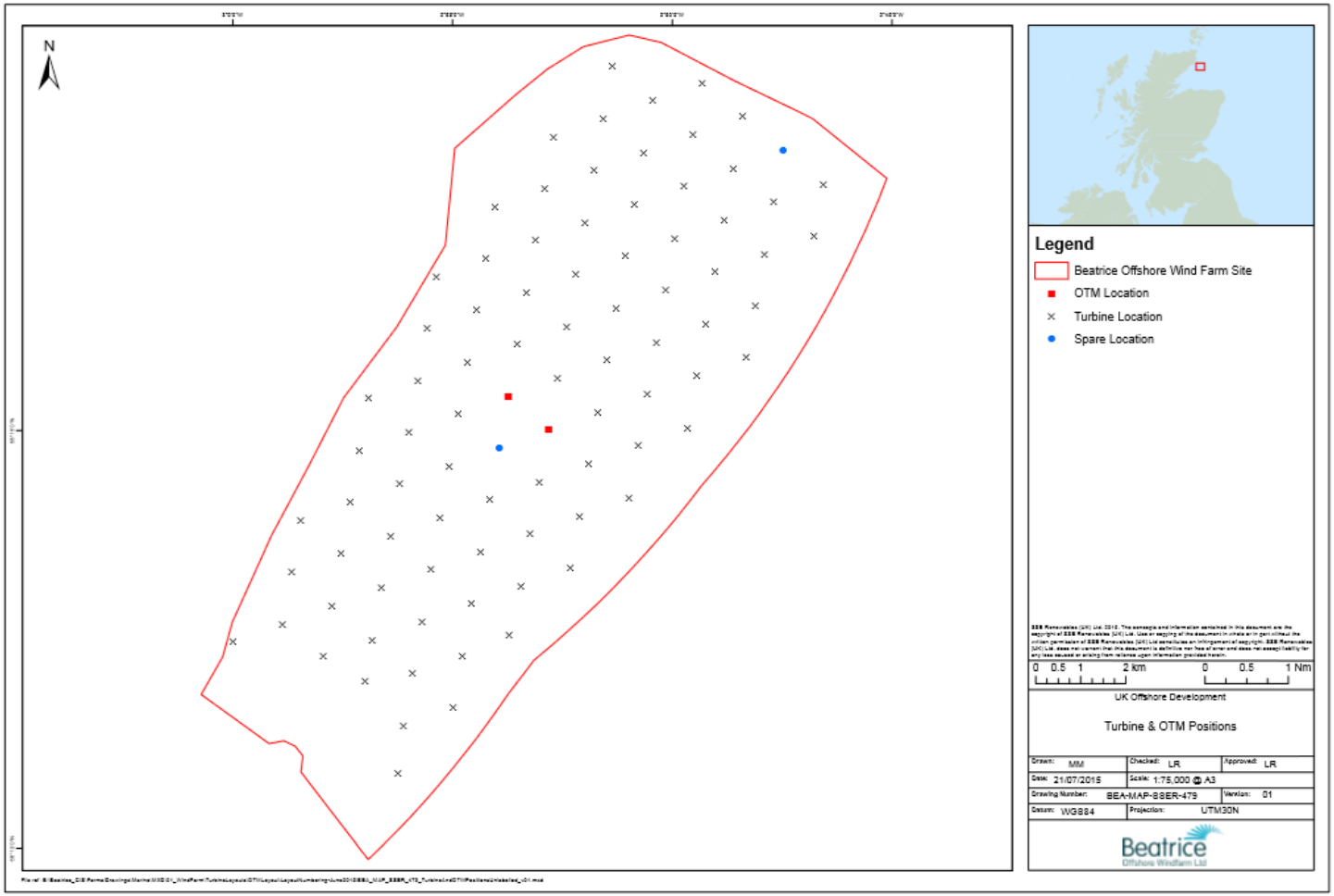


**Figure 2.2 - Beatrice Wind Farm wind turbine and OTM layout**



# 3 BOWL Statements of Compliance

## 3.1 Introduction

3.1.1 The following sections are intended to re-affirm the overarching BOWL commitments relating to environmental management of the construction and operation of the Beatrice Offshore Wind Farm in such a manner as to meet the relevant requirements set out by the Project consents but also broader legislative requirements. Specifically it sets out:

- A number of statements of compliance relating to this EMP and the broader requirements of the Project consents;
- Overarching matters related to Safety, Health and Environmental (SHE) management;
- Matters related to personnel;
- Matters related to vessels;
- Matters related to environmental mitigation;
- Matters related to good working practices; and
- Legislative requirements.

3.1.2 Reference is made throughout to other, relevant Consent Plans required by the Project consents that have been, or will be, submitted for approval and to other sections of this EMP where further detail is provided.

## 3.2 Statements of Compliance

3.2.1 BOWL in undertaking the construction and operation of the Project will ensure compliance with this EMP as approved by the Scottish Ministers (and as updated or amended from time to time following the procedure set out in Section 4.0 of this EMP).

3.2.2 Where updates or amendments are required to this EMP, BOWL will ensure the Scottish Ministers are informed as soon as reasonably practicable and where necessary the EMP will be updated or amended (see Section 4.0 below).

3.2.3 BOWL in undertaking the construction and operation of the Project will ensure compliance with other, relevant Consent Plans as approved by the Scottish Ministers including, as set out in Section 1.4 above.

3.2.4 BOWL in undertaking the construction and operation of the Project will ensure compliance with the environmental mitigation and management set out in the original application and the Environmental Statement and Supplementary Environmental Information Statement (SEIS) (see Section 6.0 and Annex 1 (ES/SEIS and consents Commitments Register) except in so far as amended by the

terms of the S36 Consent or Marine Licences.

3.2.5 BOWL will ensure compliance with overarching BOWL company SHE systems and standards, the relevant SHE legislation and such other relevant legislation and guidance designed to ensure the safety of the wind farm construction and operational personnel and other third parties (see also Section 5.0 of this EMP).

3.2.6 BOWL will make compliance with the approved EMP (and all other relevant, approved Consent Plans) a requirement for the Key Contractors through conditions of contract and will monitor compliance through an appropriate auditing process (see also Section 5.8 of this EMP).

### 3.3 SHE Management

3.3.1 BOWL are committed to undertaking the construction and operation of the Beatrice Offshore Wind farm in a way that minimises the risks to safety, health and the environment.

3.3.2 BOWL will require that all Key Contractors and Subcontractors have completed audited risk assessments for all health, safety and environmental risks associated with construction and operational activities, and that adequate control measures and actions are in place to reduce the impact of such activities to as low as reasonably practicable.

3.3.3 BOWL will ensure that such Risk Assessments are carried out and consider all foreseeable environmental impacts that could occur on the offshore windfarm as a result of construction, installation, commissioning and other marine and operational activities.

3.3.4 BOWL will ensure that safe systems of work are developed that detail the control measures taken to either eliminate environmental hazards or effectively control them.

3.3.5 The BOWL company SHE standards and risk management procedures will be applied in completing the construction and operation of the proposed Project and will be applied as minimum standards through conditions of contract with the Key Contractors and Subcontractors.

3.3.6 Management standards in line with ISO 9001, 14001 and OHSAS 18001 will be applied for the overall BOWL Project management system, and the management systems of all contractors will be required to concur to the same principles.

3.3.7 The Beatrice Offshore Wind Farm Project is a notifiable project for the purposes of the Construction (Design and Management) Regulations 2015 (CDM regulations). BOWL will ensure compliance with the CDM regulations in the design of the Project and through the completion of the construction process.

3.3.8 Further detail on SHE procedures in relation to this EMP is set out in sections 5.2 and 5.3. Roles and responsibilities including SHE are set out in Section 5.4.

### 3.4 Personnel – Training and Competence

3.4.1 BOWL will require that all personnel engaged in the construction and operational phases have adequate experience to perform the activities executed under their responsibility or in their scope in a safe manner for themselves and others and are adequately supported at all levels.

3.4.2 BOWL will require that all Key Contractors and Subcontractors have sufficient manpower resources of the required competence to meet the contractual requirements. Safe manning levels for all onshore and offshore activities will be determined by industry guidance and past experience.

3.4.3 BOWL will ensure that a Project organogram (see Figure 5.2 in Section 5.4) is in place and that the roles and responsibilities of all named personnel are clear and that clear project management procedures are in place for all aspects of the construction and operation, including those related to environmental management measures.

3.4.4 BOWL will require that all construction and operational personnel attend required inductions including, but not necessarily limited to, matters related to Site Rules, Health and Safety requirements, arrangements for First Aid and Emergency Response, Environmental Management and Incident Management.

### 3.5 Construction and Operational Vessels

3.5.1 BOWL will require that all construction and operational vessels meet the required, recognised standards and will comply with the international maritime rules (as adopted by the relevant flag state) and regulations.

3.5.2 BOWL will conduct independent vessel audits on construction and operational vessels as necessary to check that they meet these standards and are appropriate for the purpose of their prescribed roles.

3.5.3 BOWL will require that all construction and operational vessels will comply with the procedures and requirements set out in this EMP and in other relevant Consent Plans such as the VMP, the NSP, and the LMP.

### 3.6 Good Working Practices

3.6.1 BOWL will require that all possible good working practice is applied by the Key Contractors and Subcontractors throughout the construction process and subsequently during the operational phase, in seeking to minimise the risks to personnel, other sea users and the environment.

3.6.2 Good working practices that will be applied during the construction of the Project

are set out in the CMS.

### 3.7 Legislative Requirements

3.7.1 BOWL will, in undertaking the construction and operation of the Project, ensure compliance with all relevant legislation and that all necessary licences and permissions are obtained by the Key Contractors and Subcontractors, through conditions of contract and by an appropriate auditing process.

3.7.2 BOWL will comply - and require that BOWL contractors comply - with the requirements of relevant environmental and maritime legislation as standard. A register of legislation relevant to on-site environmental management and this EMP is presented in Annex 2.

# 4 Updates and Amendments to this EMP

## 4.1 Ongoing Updates and Amendments to this EMP

4.1.1 This EMP sets out the proposed environmental management framework and procedures that will be followed by all Key Contractors and Subcontractors during the construction and operation of the Beatrice Offshore Wind Farm.

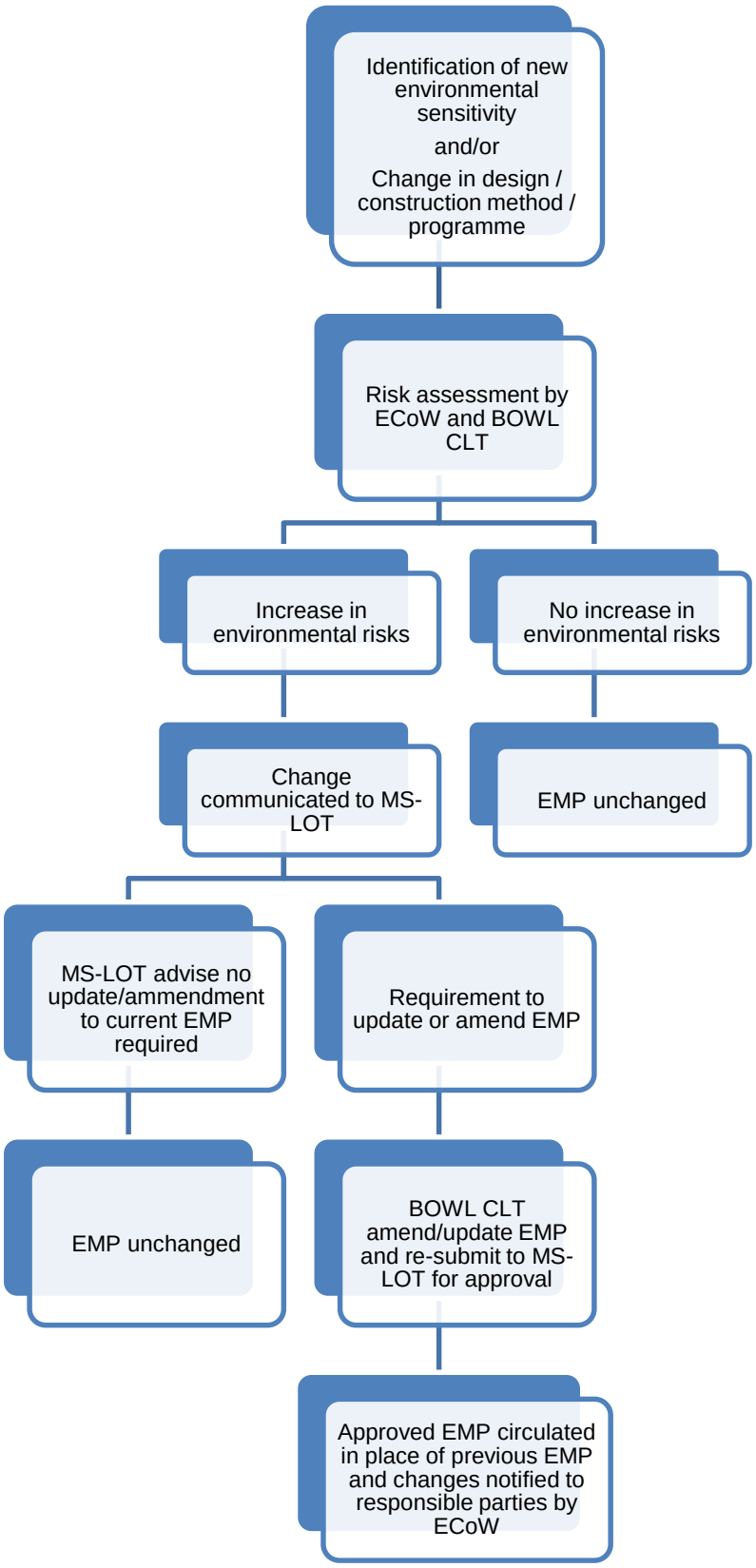
4.1.2 The S36 consent condition recognises that updates or amendments to this EMP may be required, stating that:

> *The Development [Wind Farm] must, at all times, be constructed and operated in accordance with the approved EMP (as updated and amended from time to time by the Company). Any updates or amendments made to the EMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.*
>
> And*;*
>
> *The EMP must be regularly reviewed by the Company and the MFRAG over the lifespan of the Development [Wind Farm], and be kept up to date (in relation to the likes of construction methods and operations of the Development [Wind Farm] in terms of up to date working practices) by the Company in consultation with the MFRAG.*

4.1.3 Updates to this EMP might be required, for example, due to changes to the proposed construction methodology (that require additional management or mitigation measures or changes to measures already proposed), new environmental sensitivities identified by monitoring prior to construction or following construction, emerging guidance, new legislative requirements etc.

4.1.4 Where it is necessary to update this EMP, BOWL propose to use the change management process set out in Figure 4.1 in identifying such information, communicating such change to the Scottish Ministers, re-drafting the EMP, seeking further approval for the necessary amendments or updates and disseminating the approved changes/amendments to responsible parties.

**Figure 4.1- EMP change management procedure**



### 4.2 Updates and Amendments to this EMP for the Operational Phase

4.2.1 In addition, the S36 Consent and Marine Licence (OfTW) condition requiring an EMP to be prepared also requires that:

> *The Company must, no later than 3 months prior to the Final Commissioning of the [Wind Farm] [OfTW] Development/Works, submit an updated EMP, in writing, to cover the operation and maintenance activities for the [Wind Farm] [OfTW] Development/Works to the Scottish Ministers for their written approval.*

4.2.2 In line with this requirement, BOWL will submit an updated EMP to MS-LOT for approval by the Scottish Minsters at least 3 months prior to the final commissioning of the Project. The operational EMP will reflect the working practices and potential environmental management issues set out in the approved OMP.

4.2.3 The updated EMP will focus on the activities associated with the operation and maintenance of the Development and incorporate any findings or lessons learned during the construction phase.

# 5 Environmental Management Framework

## 5.1 Introduction

5.1.1 This sections sets out the environmental management framework for the Beatrice Offshore Wind Farm, under the following areas:

- SSE SHE policy;
- BOWL SHE objectives and management;
- EMP Roles & Responsibility and Chain of Command;
- EMP – staff competency and training;
- EMP – communications and reporting;
- Environmental incident reporting;
- Auditing of EMP performance; and
- EMP document circulation and management.

5.1.2 Specific environmental management requirements and procedures are then set out in Sections 6 to 14 of this EMP.

5.1.3 Note that the environmental management framework links with the construction methods, good working practice and commitments made in the CMS.

## 5.2 SSE Safety, Health and Environmental (SHE) Policy

5.2.1 The Beatrice Offshore Wind Project is a Joint Venture (JV) project between SSE (50%), Repsol (25%) and Copenhagen Infrastructure Partners (CIP) (25%). SSE are the majority shareholders and are the Project lead.

5.2.2 SSE is committed to the prevention of injury, ill health and pollution associated with its activities, while reducing its long-term environmental burden. SSE is committed to the continual improvement of SHE management and performance, and will comply with legal obligations as a minimum. The SSE SHE Policy is shown in Figure 5.1.

**Figure 5.1 - SSE SHE policy statement**

# SHE policy

including the Major Accident Prevention Policy

## Policy

**We organise ourselves to ensure that:**

- We promote effective communications, joint consultation and co-operation on SHE matters to give all employees, their representatives and contractors the opportunity to participate
- All employees understand their duties and responsibilities for SHE management in the workplace
- This policy is available to interested parties

## People

**We support our workforce by ensuring that:**

- Direction, training, supervision and, where appropriate, specialist support is provided to employees and contractors to enable them to discharge their duty to work responsibly and with due consideration for safety, health and the environment
- Contractors, working on behalf of SSE are competent to do so and have systems to comply with all relevant legislation, standards and procedures
- Human factors are considered in the management of our operations and organisational changes are only made after risks have been assessed and mitigated

## Processes

**We manage our risks by ensuring that:**

- All hazards are systematically identified. The level of risk is assessed both under normal and abnormal conditions so that risk is eliminated or adequately controlled
- Safe systems of work are followed so that people are equipped to manage SHE risks and obligations
- Controls for the safe operation of processes are applied
- Emergency plans are developed, tested and maintained, with specific training provided

SSE is committed to the prevention of injury, ill health and pollution associated with its activities, while reducing its long-term environmental burden. We are committed to the continual improvement of our Safety, Health and Environmental (SHE) management and performance, and will comply with legal and other obligations as a minimum.

We will meet these commitments through the development and rigorous application of our SHE management system, supported by a positive culture based on fairness, trust and co-operation. We will closely manage our compliance and SHE performance and publically report on it annually.

We passionately believe that all accidents and other incidents are preventable, so we do everything safely and responsibly or not at all. We will limit our environmental burden by reducing raw material use, supporting biodiversity and reducing emissions. Our approach to Safety, Health and Environment contributes to our business performance and supports the quality of service we provide.

The SHE Advisory Committee (SHEAC) will review this policy annually and set SHE targets and objectives. The SHEAC will provide the Board with regular performance reports against these agreed targets and objectives.

## Plant

**We maintain the integrity of plant and equipment, ensuring that:**

- Risks to our employees are effectively controlled
- Operations and maintenance activities are safe and environmentally compliant
- Integrity risks are assessed and mitigated throughout the complete lifecycle of the asset
- Accurate plant and process information is maintained
- Risks are assessed prior to the introduction of any new, or changes to existing, plant, equipment or processes

## Performance

**We continually improve performance by ensuring that:**

- All adverse events are investigated and the lessons learned are communicated to interested parties
- Audits are conducted to highlight areas of concern and good practice
- Management reviews of SHE performance are conducted by managers for their area of accountability
- The SHE Committee monitors SHE performance indicators and takes effective action to manage SHE risks

sse

The Safety Family

[redacted]

**Alistair Phillips-Davies**
**Chief Executive**
**on behalf of SSE Plc.**

**Issue date 01.05.15 | Review date 30.04.16** | PO-SHE-001 v2.06

### 5.3 BOWL SHE Objectives and Management

5.3.1 The following SHE objectives have been established for all phases of the BOWL Project:

- Zero fatalities;
- Zero breaches of permit compliance;
- Zero regulatory formal warnings;
- Zero enforcement notices; and
- Zero prosecutions.

**SHE Management Plan**

5.3.2 BOWL has in place a Project-specific SHE Plan to ensure a systematic and thorough approach to SHE management is adopted by everyone involved in the Project. The plan describes how SHE standards, policies, procedures and practices shall be applied to ensure that work is carried out safely, sustainably and in line with SSE requirements. The Plan has been developed to outline the SHE management arrangements required for an Engineering Procurement Construction Installation (EPCI) contract.

5.3.3 The BOWL SHE Plan sets out the minimum SHE standards that must be adhered to by all BOWL personnel and contractors engaged on the project. It sits alongside the BOWL EMP, which similarly sets out the minimum environmental management standards that must be adhered to.

5.3.4 As a requirement of the Plan, the following 15 SSE management standards will be adopted and represent the minimum standards to be achieved:

- Safety Health & Environmental Organisational Standard (MS-SHE-001);
- Plant and Process Information Standard (MS-SHE-002);
- Safety, Health & Environment Risk Management Standard (MS-SHE-003);
- Operation & Maintenance Standard.(MS-SHE-004);
- Safe Systems of Work Management Standard (MS-SHE-005);
- Management of Plant And Process Change Standard (MS-SHE-006);
- Management of Organisational Change Standard (MS-SHE-007);
- Personnel Training and Performance Standard (MS-SHE-008);
- Contractor Safety & Performance Standard (MS-SHE-009);
- Incident Management Reporting and Investigation Standard (MS-SHE-010);
- Emergency Planning & Response Standard (MS-SHE-011);
- Asset Integrity Standard (MS-SHE-012);

- Human Factors Standard (MS-SHE-013);
- Audit Standard (MS-SHE-014); and
- Management Review Standard (MS-SHE-015).

5.3.5 BOWL is approaching the management of technical risk by adoption of the ALARP Design Procedure (ADP) which been developed to apply the principles and process defined within the SSE safety, health and environment risk management standard (MS-SHE-003). This is applied to the lifecycle of the Beatrice Offshore Wind Farm.

5.3.6 The application of the ADP to the design of the Beatrice Offshore Windfarm will provide the necessary input to the production of a Safety Case for the development. The Safety Case will provide an effective argument with referenced substantiation that the Beatrice Offshore Windfarm is safe to construct, commission, operate, maintain, and decommission in terms of the management of associated Significant Accident Hazard (SAH) risks to levels that are as low as reasonably practicable (ALARP).

5.3.7 The application of this ADP to the design of the Beatrice Offshore Windfarm will address duties relating to design under The Health and Safety at Work etc. Act 1974 and the Construction (Design and Management) Regulations 2015.

5.3.8 The overall objective of this procedure is to provide sufficient information and guidance on the process, activities, and documentation required to effectively and demonstrably manage the Significant Accident Hazard (SAH) risks associated with the design of the Beatrice Offshore Windfarm to a level that is as low as reasonably practicable (ALARP).

**Employers SHE Requirements**

5.3.9 BOWL has developed employers SHE requirements to ensure a systematic and thorough approach to safety and health management is adopted by each Key Contractor and Subcontractor involved in the Project. The Requirements outline what BOWL expects all contractors to do in ensuring and demonstrating compliance with statutory requirements and good practice.

5.3.10 The employers SHE requirements cover all contracts placed by BOWL or placed on its behalf; therefore Key Contractors are expected to communicate these to any appointed Subcontractor. Key Contractors are expected to describe how high standards, policies and effective procedures are applied to ensure that the work is carried out safely and with minimum detriment to safety, health and the environment in documentary form, including but not limited to the following:

- SHE Management Plan;
- Construction Phase Plan;
- Emergency Response Cooperation Plan; and

- Interface Management Plan.

5.3.11 BOWL will monitor the effectiveness of the Key Contractors arrangements through worksite safety inspections and management system audits detailed in the SHE Plan.

## 5.4 EMP Roles & Responsibilities and Chain of Command

5.4.1 This section sets out the roles and responsibilities of all relevant Project personnel during the construction and operational phases of the Development, in relation to the delivery of this EMP.

5.4.2 The BOWL consents require the appointment of certain specialist environmental roles to oversee the construction of the Development, including an Ecological Clerk of Works (ECoW), Fisheries Liaison Officer (FLO) and Archaeological Consultant. The ECoW role is central to the implementation of the EMP and is further described below.

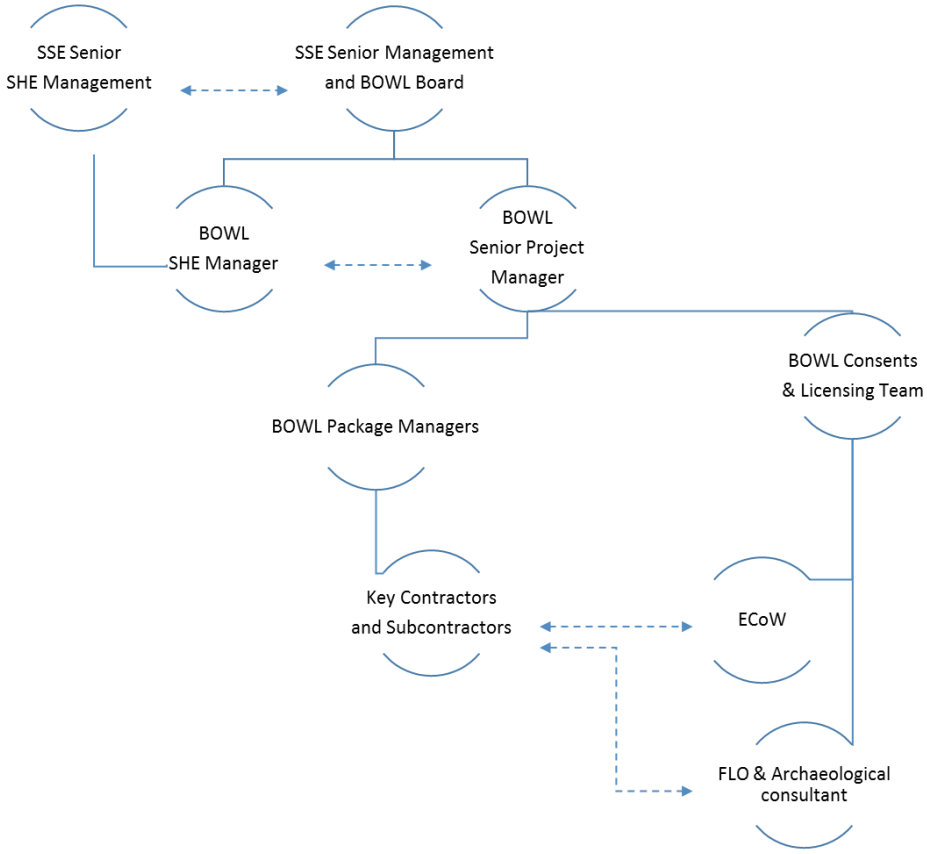
5.4.3 All Project personnel have a responsibility to comply with the requirements of the EMP, however the key roles relevant to the delivery and implementation of the EMP are:

- BOWL Senior Project Manager;
- BOWL SHE Manager;
- BOWL Package Managers;
- Key Contractors;
- Subcontractors;
- BOWL Consents and Licensing Team;
- ECoW;
- FLO; and
- Archaeological Consultant.

5.4.4 These roles are further described in the sections below. Figure 5.2 shows the linkages between the different roles and teams with respect to delivery of the EMP. Full contact details for those individuals currently assigned to the roles listed above are provided in the Project contacts list in Annex 3.

5.4.5 Note that further organisational charts and responsibilities relating to the construction and installation process, and marine co-ordination and navigational safety (including emergency response) are set out in the CMS and NSP respectively.

**Figure 5.2 - EMP lines of communication**




**BOWL Senior Project Manager**

Reports to: SSE Senior Management and BOWL Board

5.4.6 The BOWL Project Senior Manager has the following responsibilities in relation to the EMP:

- Responsible for ensuring that sufficient resources and processes are in place to deliver/comply with the EMP and to manage potential environmental impacts;
- Ensuring that provision is made for environmental management issues to form part of construction progress meetings and Project inductions;
- Ensuring that all construction personnel and contractors assist and support the ECoW where required, for example during on-site monitoring and audits;
- Ensuring that any corrective actions arising from environmental audits are addressed.
- Establishing contractual obligations for contractors in relation to EMP;
- Reporting to the SSE senior management and BOWL Board; and
- Addressing contractor and sub-contractor non-compliance.

**BOWL SHE Manager**

Reports to: SSE Senior SHE Management

5.4.7 The BOWL SHE Manager is responsible for providing support, advice and guidance on all aspects of Safety, Health & Environmental management on the Project. Key responsibilities relevant to the EMP include the following:

- Coordinating the development, monitoring and implementation of BOWL SHE management plans, which will be implemented alongside the EMP;
- Providing SHE support, advice and guidance to the BOWL Project team;
- Coaching of the Project team to facilitate improvements in SHE performance;
- Reporting to SSE Senior SHE Management; and
- SHE Auditing and reporting.

**BOWL Package Managers**

Report to: BOWL Senior Project Manager

5.4.8 The Package Managers lead and manage the delivery of engineering work packages covering marine installation, turbines and transmission systems. The Package Managers have similar responsibilities to the Senior Project Manager, but in relation to their specific packages of work.

5.4.9 The Package Managers have the following responsibilities in relation to the EMP:

- Responsible for ensuring that sufficient resources and processes are in place across their work package to deliver/comply with the EMP and to manage potential environmental impacts;
- Ensuring that provision is made for environmental management issues to form part of construction progress meetings and Project inductions;
- Ensuring that all construction personnel and contractors assist and support the ECoW where required, for example during on-site monitoring and audits;
- Ensuring that any corrective actions arising from environmental audits are addressed.
- Establishing contractual obligations for Key Contractors and Subcontractors in relation to EMP;
- Reporting to the BOWL Senior Project Manager; and
- Addressing Key Contractor and Subcontractor non-compliance.

**Key Contractors**

Report to: BOWL Package Managers

5.4.10 All contractors shall ensure that their own procedures encompass and fully discharge the mitigation and management measures and commitments presented in this EMP. This EMP forms the framework and the minimum standards for all construction and operational personnel and contractors to comply with.

5.4.11 Adherence to the BOWL EMP will be a contractual requirement and contractors will be required to develop their own task-specific method statements and EMPs in accordance with the BOWL EMP. These will be audited by BOWL.

5.4.12 The Key Contractors have the following responsibilities in relation to the EMP:

- Responsible for ensuring that sufficient resources and processes are in place to deliver/comply with the BOWL EMP and manage potential environmental impacts;
- Responsible for reporting to the BOWL management team;
- Responsible for implementing and discharging the required mitigation (control) measures on behalf of BOWL;
- Developing a contractor-specific EMP, using this overarching EMP and associated Annexes as guidance, for BOWL review and comment;
- Comply with the requirements of the BOWL overarching EMP as a minimum standard and look to include additional mitigation measures where appropriate;
- Ensure that the BOWL EMP is implemented by reviewing task specific Method Statements and Risk Assessments to ensure consistency and compliance with the overarching BOWL EMP;
- Ensuring that Subcontractors adhere to the requirements of the overarching BOWL EMP, and the Key Contractor EMP and Method Statements;
- Producing and maintaining records of activity on site and communicating those to the ECoW to enable reporting of compliance to MS-LOT; and
- Liaising with the BOWL ECoW.

**Subcontractors**

Report to: BOWL Package Managers and Key Contractors

5.4.13 Subcontractors (i.e., Subcontractors to the Key Contractors) have the following responsibilities in relation to the EMP:

- Responsible for implementing and discharging the required mitigation (control) and management measures on behalf of BOWL and Key Contractors;

- Developing a Subcontractor-specific EMP, using this overarching EMP as guidance, for Key Contractor review and comment;
- Comply with the requirements of the BOWL overarching EMP and associated Annexes as a minimum standard and look to include additional mitigation measures where appropriate;
- Ensure that the BOWL EMP is implemented by reviewing task specific Method Statements and Risk Assessments to ensure consistency and compliance with the overarching BOWL EMP;
- Producing and maintaining records of activity on site and communicating those to the ECoW to enable reporting of compliance to MS-LOT;
- Liaising with the BOWL ECoW; and
- Reporting to the Key Contractors and BOWL management team.

**BOWL Consents and Licensing Team**

Reports to: BOWL Senior Project Manager

5.4.14 Ensuring ongoing compliance with the EMP is ultimately the responsibility of the BOWL Consents and Licensing Team (CLT), supported by the ECoW. The ECoW will have primary responsibility for reporting to MS-LOT within the remit set out by the relevant consent condition.

5.4.15 The BOWL CLT will be responsible for all other reporting, returns and notifications to MS-LOT and relevant stakeholders as required by the Project consents.

5.4.16 Responsibilities for the BOWL CLT in relation to the EMP are as follows:

- Primary contact for MS-LOT, MFRAG, statutory bodies and stakeholders (including MORL) (excluding the responsibilities taken by the ECoW);
- Managing ECoW reporting on compliance with consent conditions to the Licensing Authority;
- Managing the process of obtaining new consents where necessary or monitoring consent applications made by Key Contractors;
- Attendance at Project meetings, providing environmental input;
- Reviewing contractor documentation (e.g., Method Statements and Risk Assessments, EMPs) to ensure compliance with the BOWL EMP and associated Annexes;
- Informing the FLO and Archaeological Representative of all activities taking place;
- Reporting to the BOWL Senior Project Manager.

**Ecological Clerk of Works (ECoW)**

Reports to: BOWL Consents and Licensing Team

5.4.17 The ECoW is responsible for ensuring that the EMP complies with the S36 Consent and Marine Licence conditions, commitments made in the ES and SEIS, and industry good practice. The lead ECoW will be supported by their in-house team of environmental specialists to deliver this auditing function.

5.4.18 In addition to the EMP, the ECoW will advise BOWL on compliance with the wider Consent Plans (see Sections 7.0 to 14.0), including the CMS, PEMP, PS, CaP and VMP, and will audit compliance with these plans throughout construction and into the operational phase.

5.4.19 The ECoW will also be familiar with the requirements set out in the Archaeological Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) and will be responsible for liaising with the Archaeological Consultant in the event of a potential find.

5.4.20 The ECoW will work closely with the Key Contractors and their Subcontractors and will alert the BOWL CLT and MS-LOT of any environmental issues arising.

5.4.21 In the event that the Development is progressed at the same time as the adjacent MORL development or other Scottish offshore wind projects, BOWL would explore with relevant parties whether the respective ECoWs could hold progress meetings to discuss site specific issues and share learning across projects.

5.4.22 General responsibilities for the lead ECoW include, but are not limited to, the following:

- Lead responsibility for reporting on compliance and environmental issues to MS-LOT (within the remit of the ECoW consent condition);
- Review and Quality Assurance of the EMP (and all Consents Plans and Programmes);
- Provision of advice to BOWL on compliance with consent conditions;
- Auditing of compliance with the EMP (and other relevant Consent Plans);
- Attendance at Project meetings, providing environmental input;
- Direct liaison with MS-LOT, MFRAG, statutory bodies and stakeholders (including MORL) as required;
- Managing the drafting of consents/environmental sections of BOWL Invitations to Tender and evaluation of tender responses in relation to compliance with consents and environmental requirements where relevant;
- Liaison with the MORL/other ECoW(s) as required;
- Reviewing contractor documentation (e.g., Method Statements and Risk

Assessments, EMPs) to ensure compliance with the BOWL EMP and associated Annexes; and

- Reporting to the BOWL CLT.

5.4.23 Construction-specific responsibilities include, but are not limited to:

- Attendance at daily/weekly/monthly Project meetings as required;
- Inducting site personnel on the site/works environmental policy and procedures;
- Carrying out on-site environmental audits to monitor compliance with the requirements of the relevant offshore consent(s) and the BOWL EMP;
- Authority to halt or suggest modifications to activities that would lead to non-compliance – provided that there are no overriding health and safety reasons for continuing with the activity and to be discussed with the BOWL CLT and authorised by the BOWL Senior Project Manager;
- Being part of any emergency response team dealing with any environmental incidents; and
- In the event of an archaeological discovery, liaise with the Archaeological Consultant to provide them with the details of the reported discovery.

5.4.24 During construction the lead ECoW will be supported by on-site ECoW(s) experienced in the environmental supervision of offshore works.

5.4.25 The responsibilities listed above align with the requirements set out in consent conditions and guidance on the ECoW role provided by MS-LOT.

**Fisheries Liaison Officer**

Reports to: BOWL Consents and Licensing Team

5.4.26 The BOWL FLO will be responsible for establishing and maintaining effective communications between BOWL, contractors, fishermen and other users of the sea during the construction phase. The FLO will provide information relating to the safe operation of fishing in the vicinity of the site during construction and during the operational phase.

5.4.27 The responsibilities of the BOWL FLO in relation to the EMP are as follows:

- Establish and maintain effective communications between BOWL, contractors, fishermen and other users of the sea;
- Provide information relating to the safe operation of fishing activity in the Project area;
- Participate in the Moray Firth Offshore Wind Developers Group – Commercial Fisheries Working Group (CFWG), to facilitate commercial fisheries dialogue to define and finalise a Commercial Fisheries Mitigation Strategy (S36 Consents Condition 32; OfTW Marine Licence Condition

3.2.1.4);

- Ensuring compliance with best practice guidelines and the Commercial Fisheries Mitigation Strategy (S36 Consent Condition 32; OfTW Marine Licence Condition 3.2.1.4).
- Liaising with the ECoW; and
- Reporting to the BOWL CLT.

**Archaeological Consultant**

Reports to: BOWL Consents and Licensing Team

5.4.28 The Archaeological Consultant will be responsible for advising BOWL on all archaeological matters relating to the Development that might impact upon archaeological and cultural heritage resources. They will oversee the implementation of the BOWL Marine Archaeological Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD).

5.4.29 The Archaeological Consultant has the following responsibilities:

- Liaise with BOWL to ensure that procedures are in place to comply with the WSI and PAD for Marine Archaeology;
- Provide toolbox talks on Archaeological Exclusion Zones (AEZs) in collaboration with the ECoW; and
- Monitor the effectiveness of AEZs (if required);

5.4.30 In relation to reporting of finds of archaeological interest, the Archaeological Consultant will be the initial point of contact for the ECoW. They shall:

- Brief BOWL, contractors, any Client Representatives and the ECoW on the types of archaeological finds and features that may be encountered and appropriate measures for interim conservation and safe storage;
- Advise on the identification of finds and features and, if possible, the character of their seabed locations;
- Advise on material conservation of any recovered finds;
- Agree appropriate actions to be taken; and
- Where appropriate, pass on all details and records associated with any discoveries to MS-LOT and Historic Scotland, via the BOWL CLT.

## 5.5 EMP – Staff Competence, Training and Awareness

5.5.1 BOWL is responsible for ensuring that BOWL personnel and all contractors appointed by BOWL are competent. All SSE employees must have undertaken a structured SHE training programme. BOWL has a documented process in place to manage the selection and ongoing performance of its contractors to ensure that the SHE risks associated with the contractors' activities are managed effectively.

5.5.2 BOWL will require that the Key Contractors have appropriate environmental management procedures in place and the Key Contractors will be responsible for ensuring that these procedures are adopted by their Subcontractors. BOWL will evaluate contractor tender responses in relation to demonstration of SHE competence.

5.5.3 More specifically, the ECoW will evaluate contractor tender responses in relation to compliance with consents and environmental requirements. The ECoW will also be responsible for reviewing appointed construction contractor documentation (e.g., Method Statements and Risk Assessments; contractor specific EMPs) to ensure compliance with the overarching BOWL EMP. The ECoW will advise BOWL of the outcome of this review.

5.5.4 BOWL will undertake ongoing audit and inspection of contractor's work to check compliance with SHE requirements. The ECoW will similarly undertake audits and inspections to ensure compliance with consent conditions.

5.5.5 Training and awareness specific to this EMP will be delivered by the ECoW, using the following tools:

- Inductions;
- Toolbox Talks; and
- Awareness materials.

5.5.6 The ECoW will work with BOWL to ensure that a dedicated section is included within wider contractor Project inductions to cover environment and consents issues, highlighting the key environmental sensitivities and considerations. All BOWL construction personnel and contractors will receive a Project induction.

5.5.7 The ECoW will also deliver specific training on the purposes, requirements and procedures of the Consents Plans, through a series of toolbox talks. Toolbox talks will be designed to convey key points to contractors in a clear and concise manner (IEMA, 2008). For example, a toolbox talk on pollution prevention measures would cover key roles and responsibilities, environmental sensitivities in the vicinity of the Project, and procedures to follow in the event of any spill. Toolbox talks will also be scheduled for specific issues, during key construction phases, such as marine mammals and mitigation requirements.

5.5.8 In addition to presentations and talks, the ECoW will prepare a series of awareness materials, which may include training packs, posters, signs and newsletters. For example, posters on specific procedures can be on display on notice boards in the site office and on construction vessels.

5.5.9 Training would take place regularly throughout the construction phase, in order that Project personnel (including any new personnel) are kept up to date with any changes to requirements or procedures.

5.5.10 Records of training delivered by the ECoW(s) will be maintained and filed by the lead ECoW. The records will include the content of the training delivered, record of attendance and schedule of review.

5.5.11 A summary of the training provided prior to and during the construction phase will be included in the ECoW Compliance Reports submitted to MS-LOT/Licensing Authority.

## 5.6 EMP Communications and Reporting

**Internal Communications**

5.6.1 Figure 5.2 in Section 5.4 above illustrates the lines of communication between the key roles in relation to the implementation of the EMP. It indicates the following:

- The ECoW plays a key role in the delivery of the EMP and ongoing monitoring of compliance, alongside the BOWL SHE function. In fulfilling this role, the ECoW can establish direct contact with the BOWL management team via the BOWL CLT, has direct contact with Key Contractors, Subcontractors, the Archaeological Consultant and FLO when required, and will work closely with BOWL CLT on a day to day basis;
- The ECoW will report directly to MS-LOT on compliance with the EMP;
- The BOWL CLT and ECoW will liaise with MS-LOT and other stakeholders on environmental management matters; and
- The BOWL CLT will maintain direct contact with and report on EMP compliance and environmental management issues to the BOWL Senior Project Manager.

5.6.2 During construction, weekly (or as required) progress meetings (generally via conference call) will take place involving the BOWL management team, contractors' representatives, the BOWL CLT and the ECoW. The agenda for construction progress meetings will include a section on consents compliance and environmental management, to be presented by the BOWL CLT and the ECoW.

5.6.3 Contractors will be required to report regularly to BOWL on construction activity. Contractor reporting will include information on environmental management, such as details of environmental incidents (if any), environmental statistics, and records of environmental audits and inspections undertaken and such other information as may be required for the ECoW to complete their reporting responsibilities. This information will inform external reporting to MS-LOT.

All construction personnel and contractors will be required to report any environmental concerns or issues to the BOWL management team and the ECoW immediately. See Section 5.7 below for incident reporting.

**External Communications**

5.6.4 The EMP consent condition (see Table 1.1) requires that the EMP sets out:

*The reporting mechanisms that will be used to provide the Scottish Ministers and relevant stakeholders (including, but not limited to, the JNCC, SNH, SEPA, RSPB Scotland, MCA and NLB) with regular updates on construction activity, including any environmental issues that have been encountered and how these have been addressed.*

5.6.5 Reporting on construction progress and environmental issues encountered will be completed according to the means set out in Table 5.1 below.

**Table 5.1 – EMP reporting mechanisms and frequencies**

| Communication type | Proposed frequency | Relevant stakeholders |
|---|---|---|
| ECoW compliance reporting on construction progress and issues (including the results of any audits conducted) and specifically compliance with the CMS, EMP, PEMP, PS, CaP and the VMP. | Monthly | MS-LOT (to be copied to JNCC and SNH and other relevant stakeholders by email circular) |
| BOWL CLT and ECoW telecons and meetings | As required (propose regular) | MS-LOT |
| BOWL CLT updates | As required | Moray Firth Regional Advisory Group (MFRAG) and key stakeholders |
| Incident reporting | As required | MS-LOT (see Section 5.7 below for details on incident reporting) |
| Other returns required by the Project Consents | Variable (see Table 5.3 below) | MS-LOT |

5.6.6 A template for the monthly ECoW compliance reporting template is set out in Annex 4.

5.6.7 In addition to the specific reporting requirements under the EMP condition, a number of other returns or reporting requirements are set out in the Project Consents. The relevant conditions and reporting requirements are set out in Table 5.3 below, along with the expected or required frequency for reporting to MS-LOT.

5.6.8 The relevant returns and notifications required by the conditions set out in Table 5.2 will be collated and submitted to MS-LOT by the BOWL CLT with information supplied by contractor representatives and BOWL management team where necessary.

5.6.9 Additional reporting requirements relating to environmental monitoring (as set out in the PEMP), archaeology (as set out in the archaeological reporting protocol),

navigational safety, charting and notifications (as set out in the NSP) and lighting and marking (as set out in the LMP).

**Table 5.2 - Other reporting and notification requirements set out in the Project consents (and proposed reporting frequencies)**

| Topic | Condition | Summary of requirement | Frequency |
|---|---|---|---|
| Persons responsible for deposits | Wind Farm and OfTW Marine Licence Condition 2.5 | The operators, vessels and vehicles engaging in the Licensable Marine Activity must be notified to the Licensing Authority under condition 3.1.2 prior to their engagement in the Wind Farm/OfTW | Prior to the vessels' or vehicles' engagement in the works |
| Persons acting on behalf of the Licensee | Wind Farm and OfTW Marine Licence Condition 2.6 | The name and address of any agents, contractors or Subcontractors appointed to carry out any part, or all, of the Licensable Marine Activity must be notified to the Licensing Authority under condition 3.1.2 prior to their engagement in the Wind Farm/OfTW | Prior to that person's engagement in the works |
| Force Majeure | Wind Farm and OfTW Marine Licence Condition 3.1.3 | Should the Licensee or any of their agents, contractors or Subcontractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify the Licensing Authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the Licensing Authority is obliged to immediately report force majeure incidents to the Convention Commission. | In event of an incident (see Incident Reporting Process) |
| Material alterations to the licence application | Wind Farm and OfTW Marine Licence Condition 3.1.4 | The Licensee must, where any information upon which the granting of this licence was based has after the granting of the licence altered in any material respect, notify the Licensing Authority of this fact, in writing, as soon as is practicable. | As required |
| Chemical useage | Wind Farm and OfTW Marine Licence Condition 3.1.7 | The Licensee must ensure that all chemicals which are to be utilised in the Wind Farm/OfTW have been approved in writing by the Licensing Authority prior to use. All chemicals utilised in the Wind Farm/OfTW must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002, unless approved in writing by the Licensing Authority. | Prior to chemical use |
| Commencement of the works | Wind Farm Marine Licence Condition 3.2.1.1 & OfTW Marine Licence Condition 3.2.2.1 | The Licensee must, prior to and no less than 1 month before the Commencement of the Wind Farm/OfTW, notify the Licensing Authority, in writing, of the date of Commencement of the Wind Farm/OfTW authorised under this licence. | No less than 1 month prior to commencement of the Wind Farm/OfTW |

| Topic | Condition | Summary of requirement | Frequency |
|---|---|---|---|
| SHE | S.36 Consent, Condition 7 & OfTW Marine Licence Condition 3.2.1.5 | If any serious health and safety incident occurs on the Site requiring the Company/Licensee to report it to the Health and Safety Executive, then the Company/Licensee must also notify the Scottish Ministers/Licencing Authority of the incident within 24 hours of the incident occurring. | In event of an incident |
| Marine mammals | Wind Farm Marine Licence Condition 3.2.1.4 | The Marine Mammal Observer (MMO) must maintain a record of any sightings of marine mammals and maintain a record of the action taken to avoid any disturbance being caused to marine mammals during noisy activities (such as piling). The Licensee must provide the Licensing Authority with the MMO's records no later than 6 months following Commencement of the Wind Farm, and at 6 monthly intervals thereafter. | 6 monthly intervals |
| Noise registry | Wind Farm Marine Licence Condition 3.2.1.5 & OfTW Marine Licence Condition 3.2.2.17 | The Licensee must, in the event that pile foundations are to be used, submit the appropriate completed noise reduction registry form to the Licensing Authority and the Joint Nature Conservation Committee (JNCC), stating the proposed date(s), location(s) and nature of the piling activities under authority of this licence. | Prior to the commence ment of piling |
| Transportation audit sheets | Wind Farm Marine Licence Condition 3.2.2.1 & OfTW Marine Licence Condition 3.2.3.3 | The Licensee must create, complete and submit to the Licensing Authority on the first working day of the month, a detailed transportation audit sheet for each month. The transportation audit sheet must include information on the loading facility, vessels, equipment, shipment routes, schedules and all materials to be deposited in that month. Where any alteration is made to the component parts of the transportation audit sheet, the Licensee must notify the Licensing Authority of the alteration in the following month's transportation audit sheet. If any substances or objects are missing, or an accidental deposit occurs, the Licensee must contact the Licensing Authority as soon as practicable. | First working day of each month and, in the event that missing objects are identified or a deposit occurs, as soon as reasonably practicable |
| Transportation audit reports | Wind Farm Marine Licence Condition 3.2.2.2 & OfTW Marine Licence Condition 3.2.3.4 | The Licensee must submit audit reports to the Licensing Authority stating the nature and quantity of all substances and objects deposited below MHWS. Such audit reports must be submitted by the Licensee at 6 monthly intervals, with the first such report being required to be submitted on a date no later than 6 months following the Commencement of the Wind Farm/OfTW. Where appropriate, nil returns must be provided. | 6 monthly intervals |
| Destruction or decay of the OfTW | OfTW Marine Licence Condition 3.2.3.5 | The Licensee must, notify the Licensing Authority, in writing, as soon as reasonably practicable, of any case of injury to or destruction or decay of the OfTW. The Licensing Authority will advise, in writing, of any remedial action to be taken and any requirement to display aids to navigation, following consultation with the Maritime Coastguard Agency ("MCA") the NLB or any such advisers as required. | As required |
| Noise registry | Wind Farm Marine Licence Condition 3.2.2.6 & OfTW Marine Licence Condition | The Licensee must, in the event that pile foundations are to be used, and piling is to be carried out for more than 10 consecutive days, submit at quarterly intervals, the appropriate completed noise reduction registry form to the Licensing Authority and the JNCC, stating the date(s), location(s) and nature of such activities under authority of | Quarterly, during the period of the Wind Farm/OfTW |

| Topic | Condition | Summary of requirement | Frequency |
|---|---|---|---|
| | 3.2.3.9 | this licence. | |
| Completion of the OfTW | OfTW Marine Licence Condition 3.2.4.1 | The Licensee must, no more than 1 month following the Completion of the OfTW, notify the Licensing Authority, in writing, of the date of Completion of the OfTW. | Within 1 month of completion of works |
| Nature and quantity of deposited substances and objects | Wind Farm Marine Licence Condition 3.2.3.3 & OfTW Marine Licence Condition 3.2.4.2 | The Licensee must no later than 1 month following the Completion of the Wind Farm/OfTW, submit a final audit report to the Licensing Authority stating the nature and quantity of all substances and objects deposited below MHWS. Where appropriate, nil returns must be provided. | Within 1 month of completion of Wind Farm/OfTW |
| Final commissioning of the OfTW | OfTW Marine Licence Condition 3.2.4.3 | The Licensee must, no more than 1 month following the Final Commissioning of the OfTW, notify the Licensing Authority, in writing, of the date of the Final Commissioning of the OfTW. | Within 1 month of final commissioning of OfTW |
| Noise registry | Wind Farm Marine Licence Condition 3.2.3.5 & OfTW Marine Licence Condition 3.2.4.7 | The Licensee must, in the event that pile foundations were used, submit the appropriate completed noise reduction registry form to the Licensing Authority and the JNCC, within 12 weeks of Completion of the Wind Farm/OfTW, stating the actual date(s), location(s) and nature of piling activities carried out under authority of this licence. | Within 12 weeks of completion of Wind Farm/OfTW |

## 5.7 Incident Reporting

5.7.1 In the event that an environmental or pollution incident occurs, the contractor or responsible member of staff will notify BOWL as soon as possible; the contractor will have the prime responsibility for responding to any incident.

5.7.2 In the event that a wildlife incident occurs, such as injury to a marine mammal, or an observed fish or bird mortality, the contractor or responsible member of staff will notify BOWL as soon as possible.

5.7.3 In general, all significant environmental or pollution incidents will be managed according to a process aligned with the BOWL incident and emergency response workflow set out in Annex 5 but also according to the Contractors own, compliant response procedures set out in Contractor EMP, incident response and pollution response plans.

5.7.4 For information the SSE incident reporting process is also included in Annex 5; this demonstrates how SHE incidents are elevated and investigated through the organisation.

5.7.5 Specifically, where a serious environmental or pollution incident occurs the contractor or responsible person must immediately initiate their own response procedure to control and minimise any adverse environmental effect. In addition BOWL must also be notified following the defined procedures as soon as reasonably

practicable, but ideally within 30 minutes, in order to allow BOWL to report internally and escalate where required within the business and to manage liaison with relevant authorities. The BOWL CLT shall then inform MS-LOT of all serious environmental or pollution incidents within 24 hours, providing the environmental incident report when available, and liaising with MS-LOT on any further actions to be taken.

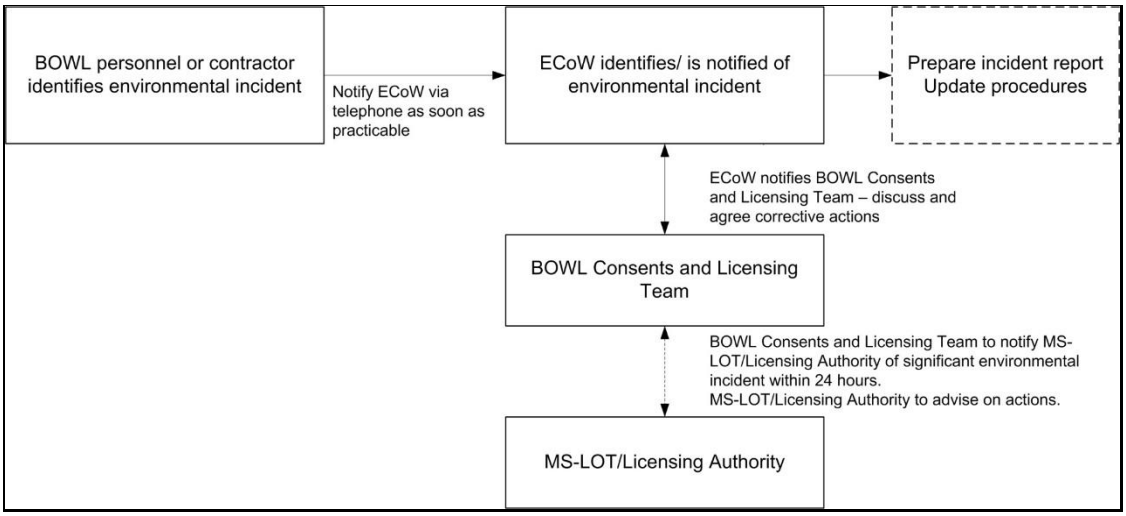
5.7.6 For less serious or significant environmental incidents (including wildlife incidents such as observed fish or bird mortality), the contractor or responsible person must record details of the incident and complete an incident report as soon as possible. In addition BOWL must also be notified as soon as reasonably practicable, but ideally within 24 hours, in order to allow BOWL to report internally and to manage liaison with relevant authorities. BOWL CLT shall inform MS-LOT within 72 hours of any such incident, providing an incident report where available and liaising with -LOT on any further actions to be taken.

5.7.7 Where management team individuals are not directly available, the incident will require to be reported via the SSE 30-minute Reporting Line (0800 096 6210). The management team will be regularly updated on the status of the incident.

5.7.8 The Joint Venture partners, Repsol and CIP, will be notified of any incident.

5.7.9 The role of the ECoW and the BOWL CLT in this process is set out in Figure 5.3 below.

**Figure 5.3 - Role of the ECoW and BOWL CLT in incident reporting**




5.7.10 The incident report raised by the Contractor or responsible person must also be passed to the ECoW (and where necessary for serious or significant incidents the ECoW should be alerted by telephone immediately). The ECoW will obtain full details of the incident, and will notify the BOWL CLT. The ECoW will discuss and agree any immediate necessary actions to minimise environmental effects with the BOWL CLT, and subsequently prepare an environmental incident report.

5.7.11 Subsequently, the ECoW and the BOWL CLT shall work with all relevant contractors and the BOWL management team to review and update procedures where necessary to prevent similar incidents from reoccurring.

5.7.12 For further information in relation to marine pollution procedures, refer to Section 10.0 of this EMP.

### 5.8 Auditing of the EMP Performance and Compliance

5.8.1 Compliance with the EMP and other relevant Consent Plans and the terms of the Project consents will be monitored through a series of audits carried out by the lead ECoW or on-site/offshore ECoW(s) throughout the construction phase. Specifically the ECoW will be required to audit compliance with the CMS, EMP, PEMP, PS, CaP and VMP

5.8.2 In addition the BOWL SHE Manager will conduct audits of contractor SHE policies and procedures and ongoing contractor SHE performance.

5.8.3 Audits conducted by the ECoW will include:

- A scheduled audit following the delivery of EMP related toolbox talk, to ensure that the requirements and procedures have been understood;
- Site visits and conversations with Project personnel to monitor awareness;
- On-site/offshore ECoW team stationed at the Marine Coordination Centre and ports during key stages in the construction programme, to monitor activities, mitigation measures and procedures, in relation to compliance with the EMP and other relevant Consent Plans; and
- Auditing of contractor EMPs/Method Statements.

5.8.4 The ECoW will develop specific checklists from the Project consents, relevant Consents Plans and Method Statements to facilitate the audit process for relevant aspects of the works during the construction phase of the Project.

5.8.5 Overall consent compliance before, during and after the construction of the Project will be monitored by the BOWL CLT and the ECoW using a consents register.

5.8.6 Details and findings of the ECoW monitoring and audit activities will be provided in the ECoW Compliance Reports (see Section 5.6).

5.8.7 MS-LOT may also undertake monitoring of compliance with the consents and approved Consent Plans through periodic site inspections. With appropriate notification, BOWL will facilitate access to all offshore construction activities for this purpose.

5.8.8 Any observations or corrective actions arising from audits and inspections will be addressed as necessary, with procedures updated in the EMP as required (see Section 4.0 above).

### 5.9 EMP document management

5.9.1 The approved EMP will be a controlled document and will be formally issued to the BOWL construction team and contractors.

5.9.2 A current copy of the EMP will be held at the following locations:

- BOWL head office;
- At the premises of any agent, contractor or sub-contractor acting on behalf of BOWL;
- All site offices dealing with marine operations;
- The Marine Coordination Centre at Wick; andWith the ECoW(s).

5.9.3 BOWL will ensure that MS-LOT are provided with the most up to date copy of the EMP.

5.9.4 A register of document versions and issue dates will be maintained by BOWL.

# 6 Environmental Management and Mitigation Measures Identified in the Application

## 6.1 Introduction

6.1.1 The requirement to construct and operate in accordance with the environmental management and mitigation measures identified in the application arises from specific requirements in the S36 Consent and Marine Licences related to this EMP, with the relevant condition set out in Table 1.1, requiring that the EMP:

*must be in accordance with the ES and SEIS as it relates to environmental management measures.*

And

*addresses mitigation measures to prevent significant adverse impacts to environmental interests, as identified in the ES and pre-consent and pre-construction surveys, and include the relevant parts of the CMS;*

6.1.2 The following sections set out how this EMP (and the associated other Consent Plans) are in accordance with the commitments made in the environmental statement (ES and the Supplementary Environmental Information Statement (SEIS)). In addition this section incorporates any other commitment relevant to environmental management and mitigation arising from the Project consents.

## 6.2 ES and SEIS Commitments Registers

6.2.1 A Commitments Register has been developed that identifies the environmental management, mitigation (and also monitoring) measures set out in the BOWL ES/SEIS as developed by the requirements of the consent conditions, and any other commitments made by BOWL to environmental management and mitigation. The Commitments Register is set out under Annex 1.

6.2.2 The Commitments Register addresses the environmental management and mitigation measures relevant to both the construction and operational phases of the Development, but also for each stage of construction as defined by the CMS, in relation to each environmental receptor as per the ES and SEIS.

6.2.3 An individual Commitments Register is presented for each of the main construction activities as described in the CMS summarised as follows:

- WTG Foundations and Substructures: in relation to the installation of steel jacket structures comprising driven steel pin piles, four leg steel jacket, grouted pile/jacket connections and flanged WTG/jacket transition piece connection;
- WTG Installation: in relation to the installation of wind turbines, comprising nacelle with hub, blades, tower and flanged tower connection;
- Inter-array cable installation: in relation to the installation of three-core, 33

kV single armour fibre optic submarine cables; and

- Other Wind Farm Infrastructure: such as metocean buoys and CCTV.

6.2.4 One register is also provided for each of the following activities:

- Wind Farm Operation;
- OfTW Construction (incorporating OTM and export cable installation); and
- OfTW Operation.

6.2.5 The Commitments Registers have been compiled through a review of the ES and SEIS, identifying those impacts where mitigation or management commitments were made, any commitments made subsequently and by identification of corresponding consent requirements, with a reference to the main Consent Plans or documents where the commitments are addressed.

### 6.3 Implementation and Auditing

6.3.1 The Commitments Registers should be used by the following responsible persons in the planning and execution of the construction and operational phases of the Project, and specifically provide:

- An easy reference point for MS-LOT as a cross check to show that the Project is being taken forward, in relation to Environmental Management measures, in a manner compliant with the original application and the Project consents;
- The basis for consent compliance tracking by BOWL CLT and the ECoW;
- The basis for the auditing of compliance with EMP requirements by the ECoW (alongside the relevant, approved Consent Plans and Project consents); and
- A source of reference for the Key contractors and Subcontractors in relation to the commitments made by BOWL and the requirements of the consents with regard to required Environmental management measures and as a guide to where relevant commitments are captured by the relevant Consent Plans (or other documents or consent requirements) and in preparing their own Project specific risk assessments or task specific EMPs.

6.3.2 The Commitments Registers serve to demonstrate that all of the environmental mitigation and management measures identified in the application and subsequent to the ES and SEIS will be addressed through the preparation of relevant Consent Plans, for approval, or in response to the discharge of other consent conditions.

### 6.4 Environmental Monitoring

6.4.1 The environmental surveys completed for the ES have been applied in identifying environmental sensitivities and the appropriate management and mitigation commitments made in the Application and reflected in the consent conditions.

6.4.2 Monitoring plans are set out for approval in the PEMP, which presents measures to monitor any environmental effects of the Development, including pre-construction, during construction and post-construction surveys as appropriate. The results of those surveys will be considered in terms of the environmental sensitivities identified and where necessary consideration will be given to the need for additional environmental management or mitigation measures to be developed in discussion with MS-LOT and MFRAG; where this is the case this EMP and/or other relevant Consent Plans will be amended.

6.4.3 The PEMP includes monitoring strategies for the following receptors:

- Birds;
- Cod;
- Herring;
- Sandeels;
- Diadromous fish;
- Benthic communities;
- Seabed scour and local sediment deposition; and
- Marine mammals.

# 7 Environmental Management and Mitigation of Effects on Marine Animals

## 7.1 Introduction

7.1.1 A number of specific measures have been identified through the application process (see Section 6.0 above). Others are embodied in a number of relevant consent conditions that will act to manage and mitigate potential impacts on the marine animals.

7.1.2 These are set out in detail in separate Consent Plans but are summarised here as key elements of the overall EMP framework. Specifically, these measures relate to:

- The management of piling operations to take account of potential effects on marine mammals and certain fish species;
- The management of vessel operations to take account of potential disturbance to marine mammal and bird species;
- The management of cable installation to take account of potential environmental effects.

7.1.3 These measures relate primarily to the management of construction activities. Measures focused on the management of environmental effects during the operational phase of the Development will be fully captured in the update to this EMP prior to Wind Farm commissioning, in line with the requirements of S36 Consent and Marine Licence requirements. Plans to monitor the longer term effects of the Development are presented in the PEMP.

7.1.4 The following sections provide an overview of the measures to be adopted with regard to each of these specific requirements, and by reference to the detail contained in other, relevant Consent Plans that will be submitted for approval by MS-LOT separately. Contractors must refer to these other approved Consent Plans for details of approved environmental management measures in respect of these issues; for a list of relevant plans see Section 1.4 above (and specific cross references in the following sections).

7.1.5 The ECoW will be responsible for auditing compliance with the S36 Consent and Marine Licence conditions, and all Consent Plans developed in response to those.

## 7.2 Environmental Management and Mitigation of Piling Operations

7.2.1 The requirement to manage piling operations in order to take account of potential effects on marine mammals and a number of fish species) is set out through a number of conditions in the Project consents, particularly the requirement to draft, for approval, a Piling Strategy (PS).

7.2.2 The PS is intended to ensure that the exposure to and/or the effects of underwater noise from piling operations have been mitigated to a reasonable level in respect of a number of key sensitivities, specifically bottlenose dolphin, harbour porpoise,

harbour seal, Atlantic salmon, cod and herring.

7.2.3 The **approved Piling Strategy** must be referred to in planning and conducting marine piling operations to ensure that the approved mitigation and management procedures are applied.

7.2.4 The PS sets out requirements related to:

- The proposed method and anticipated duration of pile driving at all piling locations;
- The soft-start piling procedures and anticipated maximum piling energy required at each pile location; and
- The mitigation and monitoring to be employed during pile-driving operations.

7.2.5 The piling contractor will be required to comply in full with the approved PS.

7.2.6 In addition, piling contractors are required to provide completed 'noise registries' under the conditions of the Project Marine Licences (see Table 1.3 above for relevant conditions). Noise registries are required to provide the proposed date(s), location(s) and nature of the piling activities under authority of this licence and must be provided prior to the construction starting, at intervals during piling works and following completion of the piling operations.

### 7.3 Environmental Management and Mitigation of Vessel Operations

7.3.1 The requirement to manage vessel operations to take account of potential disturbance to marine mammals and birds is set out through the requirement in the Project consents to draft, for approval, a Vessel Management Plan (VMP).

7.3.2 The VMP is intended to ensure that the vessel operations are managed in such a way that disturbance effects on marine mammal and bird species are managed and where required, mitigated.

7.3.3 The **approved Vessel Management Plan** must be referred to in planning and conducting all marine vessel operations to ensure that the approved mitigation and management procedures are applied.

7.3.4 The VMP sets out requirements related to:

- Defining the number, types and specification of vessels to be used during the construction and operation of the Project;
- Defining how vessel management will be coordinated, particularly during construction but also during operation; and
- Defining the location of working port(s), and how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors that will be used.

7.3.5 All Contractors and Vessel Operators will be required to comply in full with the

approved VMP and to communicate with and follow the instructions from the appointed Marine Co-coordinator or other responsible person.

7.3.6 Note that the VMP consent conditions require that the confirmed individual vessel details must be notified to the Scottish Ministers in writing no later than 14 days prior to the Commencement of the Wind Farm, and thereafter, any changes to the details supplied must be notified, as soon as practicable, to the Scottish Ministers prior to any such change being implemented in the construction or operation of the Wind Farm.

### 7.4 Environmental Management and Mitigation of Cable Installation

7.4.1 The requirement to mitigate, as far as possible, the effects arising from cable laying and protection operations (sediments and EMF) was set out in the original application (see Section 6.0 above); the Project consents require that a Cable Plan (CaP) is drafted for approval to set out matters related to the location and construction and protection of the subsea cables (inter-array and export). BOWL will submit for approval a Wind Farm CaP, relevant to inter-array cabling, and an OfTW CaP, relevant to export cables.

7.4.2 The **approved CaPs** must be referred to in planning and conducting marine subsea cable installation operations to ensure that the approved procedures are applied.

7.4.3 The CaPs will set out requirements related to:

- The location and cable laying techniques for the inter array and export cables;
- The results of survey work (including geophysical, geotechnical and benthic surveys) which will have helped inform cable routing;
- The technical specification of all cables, including a desk based assessment of attenuation of electro-magnetic field strengths and shielding;
- Route clearance operations;
- Burial risk assessment to ascertain if target burial depths can be achieved;
- Threat analysis of the cable route;
- And where burial to an adequate depth is not considered possible, details on suitable cable protection measures;
- Methodologies for over trawl surveys of the cables through the operational life of the wind farm where mechanical protection of cables laid on the sea bed is deployed; and
- Details of measures to be used in the event of cable exposure.

7.4.4 Contractors will be required to comply in full with the approved CaPs.

# 8 Environmental Management and Mitigation of Effects on Marine Archaeology

## 8.1 Introduction

8.1.1 A number of specific measures have been identified through the application process (see Section 6.0 above). Others are embodied in relevant consent conditions that will act to manage and mitigate potential impacts on the marine archaeology.

8.1.2 These are set out in detail in separate Consent Plans but are summarised here as key elements of the overall EMP framework. Specifically, these measures relate to:

- The management of construction and operation activities to take account of potential effects on marine archaeology.

## 8.2 Environmental Management and Mitigation in relation to Marine Archaeology

8.2.1 The requirement to manage and mitigate the potential effects on features of marine archaeological interest is set out in the Project consents, specifically in the requirement to draft, for approval, a protocol for archaeological reporting to ensure that any discovery of archaeological interest is properly and correctly reported.

8.2.2 The **Archaeological WSI and PAD** is intended to:

- Set out the procedures to be followed in order to avoid impacts on marine archaeology (including the development of Archaeological Exclusion Zones (AEZs). All contractors are required to be familiar with the requirements of the WSI and observe in full any established AEZs by ensuring that no works, anchoring or other seabed impacts occur within such exclusion zones.
- Present the Reporting Protocol which sets out what the Contractor must do on discovering any marine archaeology during the construction, operation, maintenance and monitoring of the Development. All contractors are required to be familiar with the requirements of the PAD and observe in full the established reporting protocol in the event of any archaeological discoveries.

8.2.3 The ECoW will work with the Archaeological Consultant to monitor and report on compliance with the approved Archaeological WSI and PAD.

# 9 Environmental Management and Mitigation of Effects on Other Marine Users

## 9.1 Introduction

9.1.1 A number of specific measures have been identified through the application process (see Section 6.0 above) and are also embodied in a number of relevant consent conditions that will act to manage and mitigate potential impacts on other marine users. These are set out in detail in a number of the other Consent Plans but are summarised here as key elements of the overall EMP framework.

9.1.2 Specifically, these measures relate to:

- The adoption of safety zones;
- Appropriate notification of construction and operational activities to other marine users;
- Appropriate charting of the Project;
- A clear process of marine co-ordination of all vessels and vessel activity;
- Appropriate marking and lighting of all vessels;
- Appropriate marking and lighting of the wind farm and OfTW;
- The Appointment of a Fisheries Liaison Officer; and
- The adoption of a Commercial Fisheries Mitigation Strategy (CFMS).

9.1.3 These measures are required under a number of other consent plan and consent condition requirements, specifically the NSP, the LMP, FLO and CFMS but the requirements are also set out in the following sections.

## 9.2 Notifications, Charting, Safety Zones and Marine Co-ordination

9.2.1 The requirement to set out procedures relating to the safety of navigation is set out in the Project consents, particularly the requirement to draft, for approval, a Navigational Safety Plan (NSP).

9.2.2 The NSP is intended to ensure that the vessel operations are managed in such a way as to mitigate the navigational risk to other legitimate users of the sea.

9.2.3 The **approved Navigational Safety Plan** must be referred to in planning and conducting all marine vessel operations to ensure that the approved mitigation and management procedures are applied.

9.2.4 The NSP sets out requirements related to:

- Navigational safety measures;
- Construction exclusion (safety) zones;
- Notice(s) to Mariners and Radio Navigation Warnings;

- Anchoring areas;
- Temporary construction lighting and marking;
- Emergency response and coordination arrangements for the construction, operation and decommissioning phases of the Development; and
- Buoyage.

9.2.5 All Contractors and Vessel Operators will be required to comply in full with the approved NSP.

### 9.3 Marking and Lighting

9.3.1 The requirement to set out procedures relating to the marking and lighting of the wind farm is set out in the Project consents, particularly the requirement to draft, for approval, a Lighting and Marking Plan (LMP).

9.3.2 The LMP is intended to ensure safe marking and lighting of the offshore wind farm in such a way as to mitigate the navigational risk to other legitimate users of the sea.

9.3.3 The **approved Lighting and Marking Plan** must be referred to in designing and installing the wind farm structures and in manoeuvring vessels in the vicinity of the wind farm. This will include appropriate measures to mark or light partially completed structures during the construction phase (such as, for example, piles installed at the seabed prior to the installation of the jacket substructures).

9.3.4 The LMP requires that the wind farm is lit and marked in accordance the navigational lighting requirements detailed in IALA Recommendation O-139.

9.3.5 All Contractors and Vessel Operators will be required to be aware of the marking and lighting of the wind farm at each stage of the Development when operating vessels in the vicinity of the wind farm and to be aware of the effects of that marking and lighting on the likely actions of other sea users.

9.3.6 The LMP also sets out requirements relating to the design and installation of aviation lighting on the wind farm structures.

### 9.4 Liaison with the Commercial Fishing Industry

9.4.1 The requirement to set out procedures relating to liaison with the commercial fishing industry was set out in the original application (see Section 6.0 above) but also in the Project consents, particularly the requirement to appoint, for approval, a fisheries liaison officer (FLO) and to draft, for approval (where necessary), a CFMS.

9.4.2 The role of the FLO includes:

- Establishing and maintaining effective communications between BOWL, the Key Contractors or Subcontractors, fishermen and other users of the sea;
- Provision of information relating to the safe operation of fishing activity on

the wind farm site or along the export cable route; and

- Ensuring that information on construction or operational activities is made available and circulated in a timely manner to minimise interference with fishing operations and other users of the sea.

9.4.3 All Contractors and Vessel Operators will be required to engage with and liaise with the nominated FLO and provide the information required for the FLO to carry out their duties in a timely manner.

9.4.4 The CFMS is intended to mitigate the effects of the wind farm construction and operation on commercial fishermen where adverse effects can be proven, following discussion with the other members of Moray Firth Offshore Wind Developer's Group – Commercial Fisheries Working Group (MFOWDG-CFWG).

9.4.5 All Contractors and Vessel Operators will be required to be aware of the implications of the CFMS in so far as they affect the carrying out of the works or ongoing operation of the Project.

# 10 Pollution Prevention and Contingency Planning

**In the event of a pollution incident, construction or operational personnel should refer immediately to the approved MPCP for details on appropriate response procedures.**

## 10.1 Introduction

10.1.1 The requirement to set out the environmental management framework for the pollution prevention and contingency planning arises from specific requirements in the Section 36 Consent and Marine Licences related to this EMP, with the relevant condition set out in Table 1.1, requiring that the EMP:

*….address, but not be limited to, the following overarching requirements for environmental management during construction:*

- *Pollution prevention measures and contingency plans;*

10.1.2 Detailed plans for the prevention of pollution incidents on-site, and management of any incidents that may occur are presented in the **approved Marine Pollution Contingency Plan (MPCP)**. In addition, provisions in the Emergency Response Cooperation Plan (ERCoP) (which will form part of the NSP) may also be relevant where the pollution event is part of a wider emergency incident.

10.1.3 Matters relating to chemical usage are considered separately under Section 11.0 below.

10.1.4 The following sections provide an overview of the BOWL marine pollution and contingency planning that will be set out, for approval, in the MPCP.

## 10.2 Relevant Legislation

10.2.1 Marine Scotland is the first point of contact in relation to marine pollution events. In addition, the Scottish Government (through Marine Scotland) is responsible as licensing authority for approving the use of chemical dispersants in shallow coastal waters.

10.2.2 Marine Scotland in Scottish Waters is also responsible for coordinating environmental advice on behalf of the Scottish Government. Marine Scotland is the regulatory authority for the use of oil spill dispersant products in accordance with the Marine and Coastal Access Act 2009, the Scottish Adjacent Waters Boundaries Order 1999 and the Marine Access (Scotland) Act 2010 (MMO, 2014).

10.2.3 Table 10.1 below sets out the main legislation in relation to pollution prevention and response that is considered in the MPCP.

**Table 10.1 – Legislation relevant to the control of pollution in offshore waters**

| Legislation | Summary |
|---|---|
| The Merchant Shipping (ISM Code) Regulations 2014 | Provides for the application of the **ISM Code** (Safety Management Certificate) on all vessels to which the SOLAS Convention applies and to other vessels to which EC regulations apply. The ISM Code provides an international standard for the safe management and operation of ships and for pollution prevention. |
| The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996 | These Regulations give effect to Annex I of MARPOL 73/78 (prevention of oil pollution) in UK waters. They address oily drainage from machinery spaces on vessels and installations and set limits for the levels of oil in discharged water from these sources. Vessels and installations are required to hold a valid **Oil Pollution Prevention Certificate**.<br>Oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above are required carry an **Oil Record Book** to record when specific operations take place on board which have the potential to lead to oil pollution from vessels and an approved **Shipboard Oil Pollution Emergency Plan (SOPEP)** in accordance with guidelines issued by the International Maritime Organisation (IMO). |
| Bonn Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances (2004) | An agreement to combat oil pollution and to stimulate active cooperation and mutual assistance among states bordering the North Sea in case of casualties or other incidents at sea that are of great concern for the protection of the coasts and related interests. |
| Marine Safety Agency (MSA) (1996) Merchant Shipping Notice No. M.1663, Vessels Engaged in Oil Recovery | Provides guidelines for the design, construction, ship's equipment and operation of offshore support vessels, which may be required to have the capability of handling, storing and transporting oil recovered from a spill in emergency situations. |
| The Merchant Shipping (Ship-To-Ship Transfers) Regulations 2010 (as amended) | Bring in controls on ship-to-ship transfers in UK waters, including prohibiting ship-to-ship transfers and bunkering operations outside harbour authority waters and put in place a legislative regime for assessing and licensing harbour authorities which propose to allow ship-to-ship transfers in their waters.<br>Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended). An exemption is provided in MSN 1829 for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling. |
| The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998 (OPRC Regulations) | The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998 introduce into UK law the oil spill planning requirements and legal oil spill reporting requirements of the OPRC Convention. |

## 10.3 BOWL Marine Pollution Prevention and Management Requirements

**Sources of Pollution and Risk Assessment**

10.3.1 An inventory of the types of pollutants (and particularly hydrocarbons – oils and lubricants) that will be used during the construction and/or operation of the Project, together with relevant preventative measures and controls is set out in Annex 8 of this EMP. This inventory of potential pollutants will inform the consideration of spill response strategies in the MPCP.

10.3.2 The approved MPCP will include more detail on the volumes, types and sources of each of these pollutants (again with the focus on hydrocarbons) that are expected to be used based on the known requirements, as a basis for a more detailed risk assessment of potential pollution events and spill response strategies.

10.3.3 During construction and operation, the nominated Marine Coordinator shall develop and keep up to date a register of all vessels involved in Beatrice offshore operations. This register will document the types and quantities of hydrocarbons carried on board (i.e., bunkers, lubrication oils and hydraulic oils).

10.3.4 BOWL construction and operational works will be conducted in such a manner as to minimise the risk of spillage and pollution. Potential risks and control measures, based on the hydrocarbon and chemical inventories on the vessels and offshore installations, will be identified through the use of planning tools such as:

- Programme review meetings (involving all relevant contractors);
- Pre-job meetings to review the final work programme(s) in detail; and
- Hazard and risk identification to test the work programme for likelihood and severity of all identified risks and to identify appropriate control measures.

10.3.5 The risk assessment and management measures will be set out in the MPCP and will include consideration of vessel refuelling at sea with due regard to industry standards and relevant legislation.

**MPCP Roles and Responsibilities**

10.3.6 BOWL has overall operational and financial responsibility for any oil or chemical spill originating from the Development during the lifetime of the Project.

10.3.7 BOWL is responsible for:

- Developing and maintaining the approved MPCP;
- Managing an ongoing spill response;
- Liaising with statutory bodies in the event of a spill.

10.3.8 BOWL will review and update the approved MPCP as necessary during the construction phase of the Beatrice Project, for example to take into account any new information or procedures. In the event of any oil or chemical spill to the marine environment, no matter how small, an internal meeting will be held following the close out of the incident to review lessons learned, with the MPCP and associated procedures updated as required.

10.3.9 Following the completion of construction, BOWL will review the MPCP and amend it as necessary for the Operation and Maintenance (O&M) phase.

10.3.10 The Key Contractors and Subcontractors have the primary responsibility for pollution prevention and contingency planning, and for spill response.

10.3.11 All contractors will be required to be familiar with the approved MPCP and to develop their own pollution prevention and contingency plans for approval by BOWL; each must be compliant with the procedures and standards that will be set out for approval in the BOWL MPCP.

10.3.12 All contractors will be responsible for ensuring relevant personnel are trained in pollution prevention and response and that appropriate pollution response equipment is available on-board vessels.

10.3.13 Where it is considered necessary based on the spill risk assessment that will be completed as part of the MPCP, BOWL will retain an oil spill response contractor who will be responsible for responding to Tier 1, 2 or 3 level spills.

**MPCP Incident Reporting**

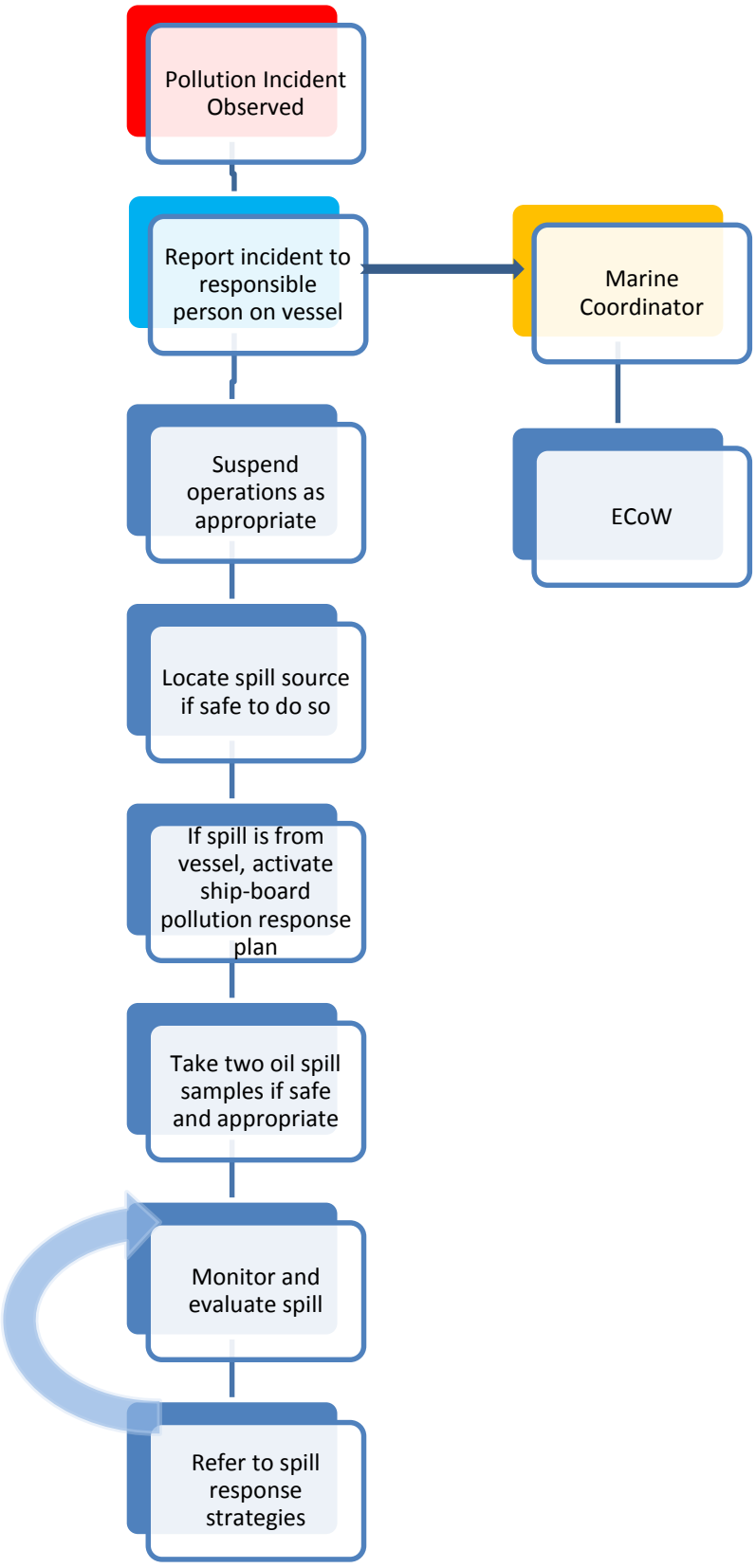
10.3.14 Internal BOWL communications to be followed in the event of an incident are detailed in Section 5.7 and in Annex 5 of this EMP.

10.3.15 In summary, the SHE Plan requires that all employees, contractors and subcontractors shall report all accidents, incidents and hazards through their responsible person.

10.3.16 The responsible person is required to ensure that significant or potentially significant incidents (including marine incidents) are immediately reported and escalated through the business management chain within 30 minutes of their occurrence or when safe to do so.

10.3.17 In relation to the offshore spill response, Figure 10.1 sets out the first response procedures that should be followed upon observation of a pollution event, including reporting of any incident to the Marine Coordinator and ECoW

**Figure 10.1 - Initial offshore spill response actions and notifications.**



**Spill Response Strategy**

10.3.18 The approved MPCP will set out the high level response strategies in the event of a pollution event based on a tiered response approach and will set out the process for tier assessment. The Contractor MPCPs will provide detail on specific pollution response planning.

10.3.19 The strategy that will be adopted in the event of an oil spill will depend upon several factors:

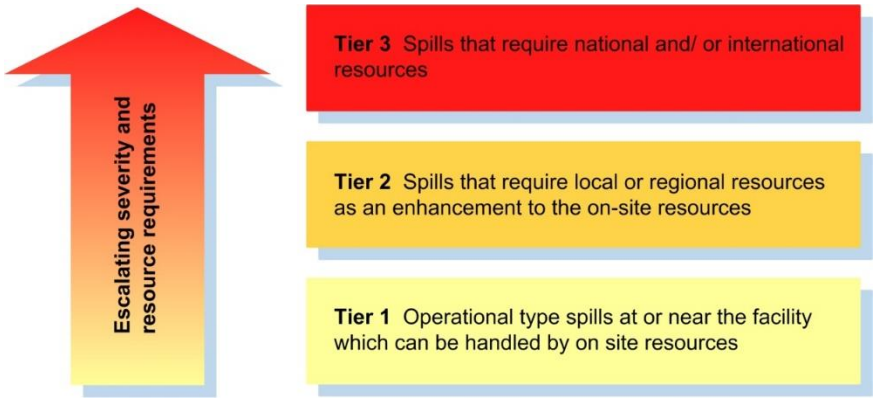
- The size and characteristics of the spilled oil or pollutant;
- It's probable and predicted behaviour in the sea;
- Consideration of the environmental sensitivities in the path of the spill; and
- Consideration of the consequences of the different response options on the environment as a whole if they were to be adopted.

10.3.20 The severity of a spill depends on its size, the complexity of the response and the potential consequences for people, environment, assets, reputation, and for the economy.

10.3.21 By adopting a tiered approach and identifying the tier level, the appropriate resources can be mobilized to combat the pollution event.

10.3.22 For general oil spill response, it is common to divide levels of response into three tiers, according to the severity of the spill and the resources required to combat it. The three tiers are commonly defined as set out in Figure 10.2.

**Figure 10.2 - The tiered response concept**




10.3.23 The appropriate response strategy will depend not only on the potential limitations of each of the possible response options, but also on the type of pollutant spilled and the environmental sensitivities that are potentially threatened by the spill.

10.3.24 Table 10.2 presents the response strategies that are generally followed on the

UK Continental Shelf (UKCS) for oil spills, according to spill Tier and oil type. The approved MPCP will provide further detail on the response strategies and resources required.

**Table 10.2 - General response strategies for oil spills according to spill tier and oil type**

| **Tier & Resources** | **Response strategies** | |
|---|---|---|
| | **Non-persistent Oil (MGO and Diesel)** | **Persistent Oil (Hydraulic and Lube Oils)** |
| **Tier 1** (small spill)<br>On site resources | Natural dispersion and monitoring (using support vessel). If safe to do so, agitate using standby vessel propeller ('prop-wash'), by steaming through the slick at speed. | Natural dispersion and monitoring.<br>Mechanical recovery where possible. |
| **Tier 2**<br>(medium spill)<br>Spill Response Contractor and additional support where necessary | Natural dispersion and monitoring (aerial surveillance).<br>Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities. | Consult specialist services from a spill response contractor.<br>Continue to monitor and evaluate strategy using aerial surveillance.<br>Boat-based dispersant application likely to be the primary response strategy – liaise with a Tier 2 contractor.<br>Consider mechanical recovery where possible.<br>Mobilise shoreline containment and recovery equipment if shoreline is threatened – spill response contractor to engage additional support if necessary. |
| **Tier 3** (large spill)<br>Ad-hoc appointment of a Tier 2/3 Spill Response Contractor | Natural dispersion and monitoring (aerial surveillance).<br>Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities. | Consult specialist services through the ad-hoc appointment of a Tier 2/3 spill response contractor.<br>Continue to monitor and evaluate strategy using aerial surveillance.<br>Aerial dispersant application likely to be the primary response strategy – through appointment of an ad-hoc Tier 2/3 spill response contractor.<br>Consider mechanical recovery where possible.<br>Mobilise shoreline containment and recovery equipment if shoreline is threatened. |

# 11 Chemical Usage

## 11.1 Introduction

11.1.1 The requirement to set out the environmental management framework for the use of chemicals during the construction and operation of the Project arises from specific requirements in the Marine Licences, specifically:

*Wind Farm/OfTW Marine Licence Condition 3.1.7: "The Licensee must ensure that all chemicals which are to be utilised in the Works have been approved in writing by the Licensing Authority prior to use. All chemicals utilised in the Works must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002, unless approved in writing by the Licensing Authority".*

*Wind Farm/OfTW Marine Licence Condition 3.1.8: "…The Licensee must ensure that all substances and objects deposited during the execution of the Works are inert (or appropriately coated or protected so as to be rendered inert) and do not contain toxic elements which may be harmful to the marine environment, the living resources which it supports or human health…"* [for full condition refer to Marine Licences]

*Wind Farm/OfTW Marine Licence Condition 3.2.2.7/3.2.1.6: "The Licensee must ensure suitable bunding and storage facilities are employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment".*

11.1.2 The following sections set out the overarching EMP framework relating to the use of chemicals during the construction and operational phases, and specifically sets out:

- Approved notified chemicals; and
- Measures for use, transport and storage.

11.1.3 Further details on management measures relating to chemical usage will be provided, for approval, in the MPCP.

## 11.2 Notified Chemicals

11.2.1 The List of Notified Chemicals is a product of the Offshore Chemical Notification Scheme (OCNS) which manages chemical use and discharge by the UK and Netherlands offshore petroleum industries, but which is also applied to the offshore renewables industry. The scheme is regulated in the UK by the Department of Energy and Climate Change (DECC) using scientific and environmental advice from Cefas and Marine Scotland (further details on the OCNS will be provided in the MPCP).

11.2.2 BOWL will require that all contractors comply with the Marine Licence conditions (as

set out above) throughout the construction and operational phases of the Project (as appropriate), by requiring that:

- All chemicals utilised are selected from the List of Notified Chemicals and (where relevant), unless otherwise approved by MS-LOT; the list of chemicals to be used will be provided for approval by MS-LOT;
- All substances and objects deposited are inert (or appropriately coated or protected) and do not contain toxic elements;
- Suitable bunding and storage facilities are employed to prevent the release of fuel oils and lubricating fluids into the marine environment;
- These conditions are addressed within each contractor's risk assessments and method statements.
- Each contractor provides a chemical inventory within their risk assessments, detailing how and when chemicals are to be used, stored and transported in accordance with best (or good) practice guidance, including (but not limited to):
  - Transport of chemicals in line with the International Maritime Dangerous Goods (IMDG) Code;
  - Storage of chemicals in line with the Control of Substances Hazardous to Health Regulations (COSHH) 2002, SHE guidance on offshore storage of chemicals (OCM guidance note 8), in addition to applicable manufacturer's guidance on storage;
  - Use of chemical products in accordance with manufacturer's instructions/recommendations.

### 11.3 Measures for use transport and storage of chemicals

11.3.1 BOWL will require that all contractors have in place appropriate procedures for the use, transport and storage of chemicals during the construction and operational phases of the Project (as appropriate), by requiring that:

- Method statements and risk assessments for the use of all chemicals are prepared;
- Relevant personnel are made aware of the method statements and risk assessments and are kept informed of all precautions concerning the storage, handling and use of chemicals;
- All suppliers' special instructions and delivery notes shall be rigorously complied with during handling, storage and use.
- Safety Data Sheets (SDS) and Control of Substances Hazardous to Health (COSHH) sheets for each substance will be reviewed to inform risk assessments, and will be appended to the risk assessments. These data sheets will be held on site where the chemicals are stored and/or used.
- Risk assessments and method statements will contain control measures to ensure that risk to the marine environment is minimised during use, storage and transport of chemicals.

- On board each vessel a nominated individual (e.g., the Marine Superintendent) is responsible for ensuring that all chemicals are adequately stored and protected and shall, in conjunction with Project and marine personnel, ensure that an efficient Stock Control System is in operation. This system shall include records for receipt, distribution and balance of all chemicals. Chemicals shall, at all times, be stored under lock and key, if possible.

# 12 Invasive Non-Native Marine Species

## 12.1 Introduction

12.1.1 The requirement to set out the environmental management framework for the management of invasive non-native species (INNS) arises from specific requirements in the Section 36 and Marine Licences related to this EMP, with the relevant condition set out in Table 1.1, requiring that the EMP:

*….address, but not be limited to, the following overarching requirements for environmental management during construction:*

- *Management measures to prevent the introduction of invasive non-native marine species;*

12.1.2 The following sections set out the overarching EMP framework for the management of INNS during the construction and operational phases, and specifically sets out:

- Relevant legislation to be observed; and
- BOWL environmental management requirements to be adopted.

## 12.2 Relevant legislation and guidelines

12.2.1 The legislation and guidelines set out in Table 12.1 is relevant to the control of INNS.

**Table 12.1 – Legislation or guidelines relating to management measures to prevent the introduction of INNS**

| Legislation / guidelines | Summary | Relevant requirement |
|---|---|---|
| International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004 | Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens though control and management of ships' ballast water and sediments. Under this Convention, all ships of 400 gross tonnes (gt) and above will be required to have on board an approved Ballast Water Management Plan and a Ballast Water Record Book, and to be surveyed and issued with an International Ballast Water Management Certificate. | Ballast Water Exchange Management Plan<br>Ballast Water Record Book<br>International Ballast Water Certificate |
| The Merchant Shipping (Anti-Fouling Systems) Regulations 2009 | Prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems and places into UK law Regulation (EC) 782/2003 on the prohibition of organotin compounds on ships.<br>Provides powers for the MCA to issue an **International Anti-fouling System Certificate** to ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons. | International Anti-fouling System Certificate |
| Resolution Mepc.207(62) 2011 | The Guidelines are intended to provide useful recommendations on general measures to minimize | General guidance on |

| Legislation / guidelines | Summary | Relevant requirement |
|---|---|---|
| Guidelines For The Control And Management Of Ships Biofouling To Minimize The Transfer Of Invasive Aquatic Species | the risks associated with biofouling for all types of ships. | minimising biofouling risks |

### 12.3 BOWL INNS environmental management requirements

12.3.1 In adopting management measures to prevent the introduction of INNS, BOWL will:

- Require that all Key Contractors and Subcontractors adopt the relevant legislative requirements;
- Require that all Key Contractors and Subcontractors produce EMPs setting out in detail procedures to prevent the introduction of INNS; and
- Ensure the ECoW reviews and audits these contractor EMPs for compliance.

12.3.2 Specific measures that BOWL will require are adopted by all Key Contractors and Subcontractors will include:

- A requirement for all vessels of 400 gross tonnage (gt) and above to be in possession of a current international Anti-fouling System (AFS) certificate;
- A requirement for all vessels of 24 m or more in length (but less than 400 gt) to carry a declaration on AFS signed by the owner or authorised agent accompanied by appropriate documentation;
- A requirement for the details of all ship hull inspections and biofouling management measures be documented by the contractor and, where applicable, recorded in the contractor's Planned Maintenance System.
- A requirement for all submersible / immiscible equipment e.g., ROVs (if required) to be subject to pre-use and post-use checks including checks for the presence of marine growth. All equipment will be required to be free of marine growth prior to mobilisation.
- A requirement for all vessels to be compliant (where applicable) with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention, developed and adopted by the International Maritime Organisation (IMO)) (i.e., ships 400 gt and above designed/constructed to carry ballast water and operating in the waters of more than one Member State), specifically:
- A requirement, where relevant, for the management of ballast water in accordance with an approved Ballast Water and Sediments Management Plan and records of such management in a Ballast Water Record Book in accordance with the provisions of the Convention.
- A requirement, where possible, and if required, for Ballast Water Exchange to take place at least 200 nm from the nearest land and in 200 m water depth

or at least 50 nm from the nearest land and in 200 m water depth.

12.3.3 In addition, BOWL will request that all contractors consider the recommendations of Resolution MEPC.207(62) 2011 guidelines for the control and management of ship's biofouling to minimize the transfer of invasive aquatic species including, for example, the implementation of a Biofouling Management Plan outlining the biofouling management measures to be undertaken on vessels.

# 13 Waste Management

## 13.1 Introduction

13.1.1 The requirement to set out the environmental management framework for the management of waste generated by the construction and operation of the Project arises from specific requirements in the S36 Consent and Marine Licences related to this EMP, with the relevant condition set out in Table 1.1, requiring that the EMP:

*….address, but not be limited to, the following overarching requirements for environmental management during construction:*

- *Measures to minimise, recycle, reuse and dispose of waste streams;*

13.1.2 The **waste management framework** for the Beatrice Offshore Wind Farm Project is set out In Annex 6 of this EMP. It sets out, in respect of the management of waste from marine operations, the following:

- The relevant regulatory framework relating to waste management;
- The roles and responsibilities in relation to waste management;
- In general terms the waste types that will be generated, including hazardous waste; and
- The waste management process, including the waste hierarchy (options to recycle, re-use and dispose), and storage and segregation of waste offshore for onshore disposal.

13.1.3 BOWL will require that all contractors and Subcontractors for the construction and operation of the Project shall:

- Produce, for BOWL approval, waste management procedures for their activities providing details of expected waste arisings and proposed procedures for waste management;
- Meet all relevant legislative requirements and obtain whatever additional licences are necessary in relation to waste management;
- Handle waste materials and refuse so that it causes the least possible damage and disturbance;
- Require that all waste is placed in suitable labelled containers;
- Require that all relevant waste is brought back to shore and disposed of in accordance with the waste management framework; and
- Ensure that the disposal of waste or refuse is only permitted by BOWL approved licensed carriers.

## 14 Notification of Dropped Objects

14.1.1 The requirement to record, notify and potentially recover objects lost or accidentally deposited on the seabed during construction or operational works arises from specific requirements in the Section 36 and Marine Licences; the relevant consent conditions are set out in Table 14.1 below (the specific elements of the consent conditions addressed by the procedures described in this section are highlighted in bold).

14.1.2 The Transportation Audit Sheet template required under Wind Farm Marine Licence Condition 3.2.2.1 and OfTW Marine Licence Condition 3.2.3.3 will be provided separately for approval by MS-LOT. Reporting requirements related to the transportation audit sheet are set out under Section 5.6.

**Table 14.1 - Marine Licence conditions relevant to notification of dropped objects**

| Consent Condition | Requirement |
|---|---|
| Wind Farm/OfTW Marine Licence Condition 3.1.3 | **Should the Licensee or any of their agents, contractors or Subcontractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify MS-LOT of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed).** Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, MS-LOT is obliged to immediately report force majeure incidents to the Convention Commission. |
| Wind Farm Marine Licence Condition 3.2.2.1<br>OfTW Marine Licence Condition3.2.3 .3 | The Licensee must create, complete and submit to MS-LOT on the first working day of the month, a detailed transportation audit sheet for each month during the period when construction of the Works is undertaken, for all aspects of the construction of the Works. The transportation audit sheet must include information on the loading facility, vessels, equipment, shipment routes, schedules and all materials to be deposited (as described in Part 2 of this licence) in that month. Where, following the submission of a transportation audit sheet to MS-LOT, any alteration is made to the component parts of the transportation audit sheet, the Licensee must notify MS-LOT of the alteration in the following month's transportation audit sheet.<br>**If the Licensee becomes aware of any substances or objects on the transportation audit sheet that are missing, or an accidental deposit occurs, the Licensee must contact MS-LOT as soon as practicable after becoming aware, for advice on the appropriate remedial action.** Should the Licencing Authority deem it necessary, the Licensee must undertake a side scan sonar survey in grid lines (within operational and safety constraints) across the area of the Works, to include cable routes and vessel access routes from local service port(s) to the |

| Consent Condition | Requirement |
|---|---|
| | Site to locate the substances or objects. If MS-LOT is of the view that any accidental deposits associated with the construction of the Works are present, then the deposits must be removed by the Licensee as soon as is practicable and at the Licensee's expense. |

14.1.3 Notification of dropped objects during the construction or operational phase will be completed using a modified PON2 process as applied by the UK Oil and Gas Industry under requirements set out by DECC (Oil & Gas UK (2014) and DECC (2014)). BOWL understand that MS-LOT are developing a modified PON2 style process for adoption by the offshore wind farm industry in Scottish waters.

14.1.4 PON2 guidance identifies dropped objects as materials lost or discarded at sea, including any materials deposited under conditions of force majeure, but excluding any materials legally deposited in accordance with the requirements of relevant legislation. Although small objects dropped into the sea are unlikely to affect the environment and other sea users, it is not possible to set a threshold under which reporting is unnecessary. Instead, operators are advised to apply some common sense as to the lower level of object that is reportable and to report any lost/dropped object if they are unsure of the hazard it might cause.

14.1.5 BOWL have provided a proposed Dropped Object Notification Pro Forma which is set out in Annex 7. This is based on a modified PON2 pro-forma. BOWL will replace this pro-forma with any version produced by MS-LOT.

14.1.6 The process to be followed in the event of any construction or operational staff becoming aware that any object has been accidentally (or by need of Force Majeure) dropped or otherwise deposited is set out below in Table 14.2.

14.1.7 A copy of this dropped object procedure and the Dropped Object Notification Pro-forma will be available on all construction and operational vessels; relevant staff will be inducted on the dropped object procedures.

14.1.8 Note that separate provisions apply for the accidental loss of pollutants; these procedures are set out in the MPCP and must be referred to in place of the following (see also Section 9 of this EMP).

**Table 14.2 – Dropped objects notification and remediation process**

| Introduction |
|---|
| This Dropped Objects Procedure identifies the measures to be put in place to manage dropped objects during the construction or operational phase of the Beatrice Offshore Wind Farm Project, including recovery where possible, and the recording of losses. This also includes procedures for communicating deposits made under circumstances of Force Majeure.<br>Dropped objects can present a significant hazard to other sea users and the marine environment. Submission of the Dropped Object Notification proforma (Annex 7) enables MS-LOT, in |

| |
|---|
| consultation with other relevant stakeholders, to decide what action should be taken and to allow notification of other sea users of any navigational hazards. |
| **Prevention** |
| Consideration should be given to minimising wherever possible the potential for objects to be dropped or otherwise accidentally deposited. Each Contractor should have its own process for ensuring equipment and materials are adequately stored and controlled and that staff are adequately trained and briefed on avoiding dropped objects or accidental deposits, and in the event that they do occur on this notification procedure.<br>Each Contractor should complete the required **Transportation Audit Sheet (TAS)** to record all materials, equipment and components being loaded and transported and deposited under the licensable activities permitted by the Marine Licences. |
| **Identification** |
| If any Contractor (or BOWL through audit of the TAS) becomes aware of any substance or objects on the TAS that are missing, or an accidental deposit occurs (for example by personnel observing or reporting that an object has been lost) the responsible Contractor will log the loss as soon as becoming aware of the incident on the notification pro-forma (providing the required details therein) and as soon as reasonably possible (but as a matter of urgency) notify BOWL of the incident and provide the completed Dropped Object Notification Pro-forma.<br>**Note that every reasonable measure should be taken to immediately retrieve dropped objects where this is considered reasonably practicable** (a Marine Licence is not required for such recovery under The Marine Licensing (Exempted Activities) (Scottish Inshore and Offshore Regions) Amendment Order 2012). |
| **Notification** |
| BOWL will notify MS-LOT by submitting the completed Dropped Object Notification Pro-forma within 6 hours of the incident occurring or within 6 hours of BOWL becoming aware of a missing object (or as soon as reasonably possible thereafter).<br>The completed Pro-forma will, at the same time, be provided to the Scottish Fishermen's Federation, the Maritime & Coastguard Agency, and Kingfisher at Seafish. Contact details are provided on the Pro-forma in Annex 7. BOWL will also notify The Crown Estate.<br>MS-LOT must also be notified of any activities to recover dropped objects that have been conducted but not been successful (or are considered unlikely to be successful) or that are planned (but may take some time) at the time of notification |
| **Recovery** |
| MS-LOT will provide advice to BOWL on appropriate remedial action in relation to each incident reported.<br>MS-LOT may deem it necessary to carry out a side scan survey to locate the substances or objects, and may require the deposits to be removed by BOWL (as set out under Wind Farm Marine Licence Condition 3.2.2.1 and OfTW Marine Licence Condition 3.2.3.3).<br>The results of any such surveys must be analysed as soon as reasonably possible and the proposed remedial action and proposals for recovery of the Dropped Object must be provided to MS-LOT |
| **Exemptions from Notification** |
| The Notification Pro-forma can be delayed in the event that a vessel makes immediate attempts to retrieve the object, and if recovery is successful then notification is not required. |

## Registers

## Annex 1 – BOWL ES/SEIS and Consents Commitments Registers

# Annex 1 – BOWL ES/SEIS and Consents Commitments Register

## Annex 1.1 - Wind Farm Construction Commitments Register

## Foundation and Jacket Installation

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| **Physical Processes** | | | | | |
| Foundation installation | Increase in suspended sediment concentrations as a result of foundation installation activities. | Construction best practice to minimise sediment release to the marine environment. | Development of a CMS that includes construction good working practices. | S36 Consent Condition 11 (CMS) | CMS |
| Foundation installation | Accumulation of sediment and change of sediment type at the seabed as a result of foundation Installation activities. | Visual or bathymetric surveys pre and post-construction at selected locations within the Wind Farm site (for locally deposited sands from drilling). | Development of a PEMP that includes a scour monitoring strategy. | S36 Consent Condition 27 (PEMP) | PEMP |
| **Benthic Ecology** | | | | | |
| Anchor drag/ temporary zone of influence | Disturbance of the seabed | A programme of monitoring to be agreed with the relevant authorities. | Development of a PEMP that includes pre- and post-construction monitoring of the effects of disturbance on the MoeVen biotope within the OWF site. | S36 Consent Condition 27 (PEMP) | PEMP |
| Seabed preparation/ drilling | Sediment deposition | A programme of monitoring to be agreed with the relevant authorities. | Development of a PEMP that includes pre- and post-construction monitoring of the physical characteristics of the sediments associated with drill arisings within the MoeVen biotope (should drilling be required to facilitate jacket installation). | S36 Consent Condition 27 (PEMP) | PEMP |
| Grouting / spillage from vessels and equipment | Release of chemicals | Development of an Environmental Management System to manage grouting. | Development of a CMS that includes information on grout management.<br><br>Development of a MPCP. | OfTW ML Condition 3.2.2.4 (CMS)<br><br>S36 Consent Condition 11 (CMS)<br><br>Wind Farm & OfTW ML Condition 3.1.12 (MPCP) | CMS<br><br>MPCP |
| **Fish and Shellfish** | | | | | |
| Piling | Construction noise | Implementation of soft-start during piling.<br><br>BOWL will work with key stakeholders and MS-LOT/Licensing Authority to identify any future monitoring programmes considered necessary. | Development of a PS.<br><br>Pre-construction herring monitoring surveys.<br><br>Pre- and post-construction cod surveys.<br><br>Atlantic salmon monitoring surveys. | S36 Consent Conditions 12 (PS), 27 (PEMP), 31 (Fish Strategy), 34 (Herring), 35 (Cod) | PS<br><br>PEMP |
| **Marine mammals** | | | | | |
| Piling | Physical injury, displacement and behavioural impacts resulting from pile driving. | Piling undertaken in accordance with the JNCC pile driving protocol (JNCC, 2010): 'soft-start' procedure of no less than 20 minutes, employment of dedicated MMOs and Passive Acoustic Monitoring (PAM) operatives with the aim of detecting marine mammals within an agreed 'mitigation zone' (no less than 500 m measured from the pile location).<br><br>If concurrent piling operations are undertaken, vessels will operate at no more than 5 km from each other.<br><br>Development and implementation of a comprehensive Marine Mammal Monitoring Programme, to include acoustic surveys to monitor the existing noise levels in the Moray Firth and collation of data from other studies that can provide information on key | Development of a PS.<br><br>BOWL is in the process of discussing specific mitigation for inclusion in the PS with MS-LOT and the statutory consultees, as a more appropriate mitigation strategy has been proposed since submission of the ES and SEIS. The proposed mitigation procedure builds on the draft JNCC (2010) guidelines for an engineering soft start but, with specific consideration to the marine mammal ecology of the Moray Firth and recommends the use of Acoustic Deterrent Devices (ADDs) prior to soft start to ensure that animals clear the injury zone.<br><br>Development of a PEMP including a MMMP. | S36 Consent Conditions 12 (PS), 27 (PEMP) and 15 (EMP).<br><br>Wind Farm ML Condition 3.2.1.4 (Marine mammal monitoring) | PS<br><br>PEMP<br><br>EMP |

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| | | prey populations, physical processes, by-catch etc. Further information on the PCoD will be sought from the SMRU Ltd and University of Aberdeen study. | BOWL has developed a MMMP in conjunction with MORL comprising a suite of studies aimed at understanding the effects of piling on marine mammal species, with specific focus on bottlenose dolphin and harbour seal as the two key species listed in the S36 Consent. The MMMP is aligned with the mitigation strategy in order to test the effectiveness of the proposed mitigation.<br><br>Development of an EMP that includes commitments to marine mammal monitoring. | | |
| Movement of construction vessels | Physical injury/mortality from vessels with ducted propellers and ship strike. | BOWL will work closely with the statutory authorities to further the understanding of the potential risk to grey seals from vessels using ducted propellers.<br><br>Operators of all vessels involved in construction will be made aware of the risks. | BOWL has been monitoring the ongoing research on corkscrew injuries and recent findings suggest that adult grey seals can inflict such wounds and may therefore be a primary cause of such trauma. No mitigation or monitoring has therefore been proposed, although vessel operators will be made aware of the risks of vessels using ducted propellers. | S36 Consent Condition 16 (VMP) | VMP |
| **Birds** | | | | | |
| Vessel traffic | Disturbance | Best practice monitoring of bird use within the Wind Farm Site and 4 km buffer will be undertaken: pre-construction, construction and post-construction monitoring in order to identify any changes in bird usage of the Wind Farm site attributable to the Development. | Development of a PEMP, including bird monitoring.<br><br>BOWL is the advanced stages of developing an ornithological monitoring strategy with MORL and in consultation with key stakeholders. BOWL commenced pre-construction aerial bird surveys in 2015.<br><br>Development of a VMP, which takes account of bird sensitivities. | S36 Consent Conditions 16 (VMP) and 27 (PEMP) | PEMP<br><br>VMP |
| Construction activities | Disturbance | | | | |
| **Marine Archaeology** | | | | | |
| Construction activities | Direct physical effects (direct effects on archaeological sites, features, deposits and artefacts). | Implementation of temporary exclusion zones to avoid damage to or loss of an asset.<br><br>Should it not be possible to avoid sites of cultural heritage interest, a full programme of archaeological investigation will be undertaken and an appropriate mitigation strategy agreed with Historic Scotland.<br><br>Development of a Protocol for Archaeological Discoveries (PAD). | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| Construction activities | Secondary physical effects on archaeological sites, features and artefacts (e.g., the effects of anchoring of vessels and associated activities during the installation phase). | Temporary exclusion zones will be implemented to prevent secondary effects resulting from invasive activities, such as cable installation, anchoring or installation of jack-up vessels. Exclusion zones of 100 m will be established around sites identified as being of high sensitivity, while an exclusion zone of a minimum 50 m will be established around those of medium sensitivity.<br><br>Use of dynamic positioning systems for construction vessels would reduce the need for anchoring and the likelihood of secondary effects to cultural heritage assets. | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| **Commercial Fisheries** | | | | | |
| Physical presence of partially completed infrastructure | Temporary loss or restricted access to traditional fishing grounds | A Working Group to be established that facilitates:<br><br>• Ongoing dialogue with fishermen prior to and during the construction phase; and<br>• Protocol for the navigation of wind farm construction and works vessels to and from the site (i.e. agreement of transit | Development of a CFMS and participation in the Moray Firth CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users. | S36 Consent Conditions 32 (CFMS) and 33 (FLO) | CFMS<br><br>FLO |

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| | | lanes to minimise interference to fishing activities). | | | |
| Physical presence of partially completed infrastructure | Safety issues for fishing vessels | Safety zones during the construction phase.<br><br>All infrastructure installed during the construction phase will be marked and lit, in line with standard industry practice. | Development of a NSP.<br><br>Development of a LMP. | S36 Consent Conditions 18 (NSP) and 20 (LMP)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting) and 3.2.2.3 (Navigational Safety) | NSP<br><br>LMP |
| Physical presence of partially completed infrastructure and Safety Zones | Displacement of fishing vessels into other areas | A Working Group to be established that facilitates:<br><br>• Ongoing dialogue with fishermen prior to and during the construction phase; and<br>• Protocol for the navigation of wind farm construction and works vessels to and from the site (i.e. agreement of transit lanes to minimise interference to fishing activities). | Development of a CFMS and participation in the Moray Firth CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users. | S36 Consent Conditions 32 (CFMS) and 33 (FLO) | CFMS<br><br>FLO |
| Physical presence of partially completed infrastructure and Safety Zones | Interference with fishing activities (e.g., navigational conflicts arising between fishing vessels and construction vessels) | A Working Group to be established that facilitates:<br><br>• Ongoing dialogue with fishermen prior to and during the construction phase;<br>• Protocol for the navigation of wind farm construction and works vessels to and from the site (i.e. agreement of transit lanes to minimise interference to fishing activities);<br>• Established procedures in the event of interactions between wind farm construction and fishing activities (i.e. claims for lost and/or damaged gear); and<br>• Protocol for removal of seabed obstacles post-construction. | Development of a CFMS and participation in the CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users.<br><br>Development of a NSP.<br><br>Development of an EMP including a dropped objects procedure. | S36 Consent Conditions 15 (EMP), 18 (NSP), 32 (CFMS) and 33 (FLO)<br><br>Wind Farm ML Condition 3.2.2.1 (Transportation Audit Sheet) | CFMS<br><br>NSP<br><br>FLO<br><br>EMP |
| **Shipping and Navigation** | | | | | |
| Wind Farm construction | Routeing (distance, time, fuel cost and collision risk): Commercial, recreational and fishing vessels | Wind Farm and inter-array cables will be charted by the UKHO.<br><br>Structures to be marked and lit in line with NLB and IALA guidance.<br><br>Appropriate liaison to ensure information is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media.<br><br>Control Centre to monitor AIS and non-AIS vessels by CCTV. Vessels identified in construction areas or safety zones to be identified and contacted.<br><br>A vessel will be nominated to monitor the safety zones and guard against any infringements. | Development of a NSP.<br><br>Development of a LMP.<br><br>Development of a DSLP. | S36 Consent Conditions 13 (DSLP), 18 (NSP) and 20 (LMP)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting), 3.2.2.3 (Navigational Safety), 3.2.2.4 and 3.2.2.5 (Marking and Lighting). | NSP<br><br>LMP<br><br>DSLP |
| Wind Farm construction | SAR operations, including SAR resources, transit distance and time | Compliance with MCA's Marine Guidance Notice (MGN) 371 including Annex 5: "Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident in or around an OREI".<br><br>Emergency Response Cooperation Plan (ERCoP) and Safety Management System. | Development of a NSP. | S36 Consent Condition 18 (NSP) | NSP |

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| **Aviation** | | | | | |
| Foundation and top side structure installation / operational turbines | Obstruction to aviation activity | Wind Farm will be equipped with a lighting scheme which fulfils the requirements set out in Article 220 of CAP 393 Air Navigation: The Order and the Regulations and as detailed to support winching operations at the wind farm. | Development of a NSP.<br><br>Development of a LMP, with structures to be marked and lit in line with CAA and DIO policy and guidance.<br><br>Development of a DSLP.<br><br>Turbine locations and substation platforms will be charted by the UKHO. | S36 Consent Conditions 13 (DSLP), 18 (NSP) and 20 (LMP) and 25 (UKHO)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting), 3.2.2.3 (Navigational Safety), 3.2.2.4 (Marking and Lighting), 3.2.3.2 (Navigational Safety) and 3.2.3.4 (Marking and Lighting) | DSLP<br><br>NSP<br><br>LMP |
| **Invasive non-native species** | | | | | |
| Physical presence of structures | Possible stepping stone effect for invasive species | No specific mitigation or monitoring proposed. | Development of an EMP detailing appropriate management practices to be implemented. | Wind Farm ML Condition 3.1.8 (Environmental Protection)<br><br>S36 Consent Condition 15 (EMP) | EMP |

## Tower and WTG Installation

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| **Benthic Ecology** | | | | | |
| Jack-up/ anchor drag | Disturbance of the seabed | A programme of monitoring to be agreed with the relevant authorities. | Development of a PEMP that includes pre- and post-construction monitoring of the MoeVen biotope within the OWF site. | S36 Consent, Condition 27 (PEMP) | PEMP |
| Spillage from vessels/ equipment | Release of chemicals | Development of an Environmental Management System to manage pollution events. | Development of an EMP that includes pollution prevention measures.<br><br>Development of a MPCP. | S36 Consent, Condition 15 (EMP)<br><br>Wind Farm & OfTW ML Condition 3.1.12 (MPCP) | EMP<br><br>MPCP |
| **Marine Mammals** | | | | | |
| Movement of construction vessels | Physical injury/mortality from vessels with ducted propellers and ship strike. | BOWL will work closely with the statutory authorities to further the understanding of the potential risk to grey seals from vessels using ducted propellers.<br><br>Operators of all vessels involved in construction will be made aware of the risks. | BOWL has been monitoring the ongoing research on corkscrew injuries and recent findings suggest that adult grey seals can inflict such wounds and may therefore be a primary cause of such trauma. No mitigation or monitoring has therefore been proposed, although vessel operators will be made aware of the risks of vessels using ducted propellers. | S36 Consent Condition 16 (VMP) | VMP |
| **Birds** | | | | | |
| Vessel traffic | Disturbance | Best practice monitoring of bird use within the Wind Farm Site and 4 km buffer will be undertaken: pre-construction, construction and post-construction monitoring in order to identify any changes in bird usage of the Wind Farm site attributable to the Development. | Development of a PEMP, including bird monitoring.<br><br>BOWL is the advanced stages of developing an ornithological monitoring strategy with MORL and in consultation with key stakeholders. BOWL commenced pre-construction aerial bird surveys in 2015.<br><br>Development of a VMP, which takes account of bird sensitivities. | S36 Consent Conditions 16 (VMP) and 27 (PEMP) | PEMP<br><br>VMP |
| Construction activities | Disturbance | | | | |
| **Marine Archaeology** | | | | | |
| Construction activities | Direct physical effects (direct effects on archaeological sites, features, deposits and artefacts). | Implementation of temporary exclusion zones to avoid damage to or loss of an asset.<br><br>Should it not be possible to avoid sites of cultural heritage interest, a full programme of archaeological investigation will be undertaken and an appropriate mitigation strategy agreed with Historic Scotland.<br><br>Protocol for Archaeological Discoveries (PAD). | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| Construction activities | Secondary physical effects on archaeological sites, features and artefacts (e.g., the effects of anchoring of vessels and associated activities during the installation phase). | Temporary exclusion zones will be implemented to prevent secondary effects resulting from invasive activities, such as cable installation, anchoring or installation of jack-up vessels. Exclusion zones of 100 m will be established around sites identified as being of high sensitivity, while an exclusion zone of a minimum 50 m will be established around those of medium sensitivity.<br><br>Use of dynamic positioning systems for construction vessels would reduce the need for anchoring and the likelihood of secondary effects to cultural heritage assets. | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| **Shipping and Navigation** | | | | | |
| Wind Farm construction | Routeing (distance, time, fuel cost and collision risk): Commercial, recreational and fishing vessels | Wind Farm and inter-array cables will be charted by the UKHO.<br><br>Structures to be marked and lit in line with NLB and IALA guidance.<br><br>Appropriate liaison to ensure information is circulated in Notices to Mariners, Navigation Information Broadcasts | Development of a NSP.<br><br>Development of a LMP.<br><br>Development of a DSLP. | S36 Consent Conditions 13 (DSLP), 18 (NSP) and 20 (LMP)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting), 3.2.2.3 (Navigational | NSP<br><br>LMP<br><br>DSLP |

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| | | and other appropriate media.<br><br>Control Centre to monitor AIS and non-AIS vessels by CCTV. Vessels identified in construction areas or safety zones to be identified and contacted.<br><br>A vessel will be nominated to monitor the safety zones and guard against any infringements. | | Safety), 3.2.2.4 and 3.2.2.5 (Marking and Lighting). | |
| Wind Farm construction | SAR operations, including SAR resources, transit distance and time | Compliance with MCA's Marine Guidance Notice (MGN) 371 including Annex 5: "Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident in or around an OREI".<br><br>Emergency Response Cooperation Plan (ERCoP) and Safety Management System. | Development of a NSP. | S36 Consent Condition 18 (NSP) | NSP |
| **Aviation** | | | | | |
| Foundation and top side structure installation / operational turbines | Obstruction to aviation activity | Wind Farm will be equipped with a lighting scheme which fulfils the requirements set out in Article 220 of CAP 393 Air Navigation: The Order and the Regulations and as detailed to support winching operations at the wind farm. | Development of a NSP.<br><br>Development of a LMP, with structures to be marked and lit in line with CAA and DIO policy and guidance.<br><br>Development of a DSLP.<br><br>Turbine locations and substation platforms will be charted by the UKHO. | S36 Consent Conditions 13 (DSLP), 18 (NSP) and 20 (LMP) and 25 (UKHO)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting), 3.2.2.3 (Navigational Safety), 3.2.2.4 (Marking and Lighting), 3.2.3.2 (Navigational Safety) and 3.2.3.4 (Marking and Lighting) | DSLP<br><br>NSP<br><br>LMP |

## Inter-Array Cable Installation

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| **Physical Processes** | | | | | |
| Inter-array cable installation | Increase in suspended sediment concentrations and deposition of sediment as a result of inter-array cable installation activities. | Construction best practice to minimise sediment release to the marine environment. | Development of CMS including good working practices. | S36 Consent Condition 11 (CMS) | CMS |
| **Benthic Ecology** | | | | | |
| Spillage from vessels/ equipment | Release of chemicals | Development of an Environmental Management System to manage pollution events. | Development of an EMP that includes pollution prevention measures.<br><br>Development of a MPCP. | Wind Farm Conditions 3.1.8 (Environmental Protection) and 3.1.12 (MPCP)<br><br>S36 Consent, Condition 15 (EMP) | EMP<br><br>MPCP |
| **Marine mammals** | | | | | |
| Movement of construction vessels | Physical injury/mortality from vessels with ducted propellers and ship strike. | BOWL will work closely with the statutory authorities to further the understanding of the potential risk to grey seals from vessels using ducted propellers.<br><br>Operators of all vessels involved in construction will be made aware of the risks. | BOWL has been monitoring the ongoing research on corkscrew injuries and recent findings suggest that adult grey seals can inflict such wounds and may therefore be a primary cause of such trauma. No mitigation or monitoring has been proposed, although vessel operators will be made aware of the risks of vessels using ducted propellers. | S36 Consent Conditions 16 (VMP) | VMP |
| **Birds** | | | | | |
| Vessel traffic | Disturbance | Best practice monitoring of bird use within the Wind Farm Site and 4 km buffer will be undertaken: pre-construction, construction and post-construction monitoring in order to identify any changes in bird usage of the Wind Farm site attributable to the Development. | BOWL is the advanced stages of developing an ornithological monitoring strategy with MORL and in consultation with key stakeholders. BOWL commenced pre-construction aerial bird surveys in 2015. | S36 Consent Condition 15 (EMP), 16 (VMP), and 28 (PEMP) | EMP<br><br>PEMP<br><br>VMP |
| Construction activities | Disturbance | | | | |
| **Marine Archaeology** | | | | | |
| Construction activities | Direct physical effects (direct effects on archaeological sites, features, deposits and artefacts). | Implementation of temporary exclusion zones to avoid damage to or loss of an asset.<br><br>Should it not be possible to avoid sites of cultural heritage interest, a full programme of archaeological investigation will be undertaken and an appropriate mitigation strategy agreed with Historic Scotland.<br><br>Protocol for Archaeological Discoveries (PAD). | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| Construction activities | Secondary physical effects on archaeological sites, features and artefacts (e.g., the effects of anchoring of vessels and associated activities during the installation phase). | Temporary exclusion zones will be implemented to prevent secondary effects resulting from invasive activities, such as cable installation, anchoring or installation of jack-up vessels. Exclusion zones of 100 m will be established around sites identified as being of high sensitivity, while an exclusion zone of a minimum 50 m will be established around those of medium sensitivity.<br><br>Use of dynamic positioning systems for construction vessels would reduce the need for anchoring and the likelihood of secondary effects to cultural heritage assets. | Development of a WSI and PAD. | S36 Consent Condition 37 (Archaeology) | WSI & PAD |
| **Commercial fisheries** | | | | | |
| Physical presence of partially completed infrastructure | Safety issues for fishing vessels | Safety zones during the construction phase.<br><br>All infrastructure installed during the construction phase will be marked and lit, in line with standard industry | Development of a NSP.<br><br>Development of a LMP. | S36 Consent Conditions 18 (NSP), 19 (CaP), 20 (LMP) and 33 (FLO)<br><br>Wind Farm ML Conditions 3.2.1.3 | NSP<br><br>LMP |

| Activity | Potential Impact | BOWL Environmental Management, Mitigation and Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or Plan |
| | | practice.<br><br>The surface-laying of inter-array cables will be minimised.<br><br>Cables will be buried to a target depth of one metre, where it is reasonably practicable to do so. Where alternative protection is required, BOWL will seek to install appropriate and reasonable protection where feasible. | FLOs appointed to establish and maintain effective communications with fishermen and other sea users.<br><br>Development of a CaP. | (Safety and Charting) and 3.2.2.3 (Navigational Safety) | FLO<br><br>CaP |
| **Shipping and Navigation** | | | | | |
| Wind Farm construction | Routeing (distance, time, fuel cost and collision risk): Commercial, recreational and fishing vessels | Wind Farm and inter-array cables will be charted by the UKHO.<br><br>Structures to be marked and lit in line with NLB and IALA guidance.<br><br>Appropriate liaison to ensure information is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media.<br><br>Control Centre to monitor AIS and non-AIS vessels by CCTV. Vessels identified in construction areas or safety zones to be identified and contacted.<br><br>A vessel will be nominated to monitor the safety zones and guard against any infringements. | Development of a NSP.<br><br>Development of a LMP.<br><br>Development of a DSLP. | S36 Consent Conditions 13 (DSLP), 18 (NSP) and 20 (LMP)<br><br>Wind Farm ML Conditions 3.2.1.3 (Safety and Charting), 3.2.2.3 (Navigational Safety), 3.2.2.4 and 3.2.2.5 (Marking and Lighting). | NSP<br><br>LMP<br><br>DSLP |
| Wind Farm construction | SAR operations, including SAR resources, transit distance and time | Compliance with MCA's Marine Guidance Notice (MGN) 371 including Annex 5: "Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident in or around an OREI".<br><br>Emergency Response Cooperation Plan (ERCoP) and Safety Management System. | Development of a NSP. | S36 Consent Condition 18 (NSP) | NSP |

## Annex 1.2 - OfTW Construction Commitments Register

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| **Physical processes** | | | | | |
| OfTW cable installation | Increase in suspended sediment concentrations and deposition of sediments. | Construction best practice to minimise sediment release to the marine environment. | Development of a CMS that includes good working practices during installation. | OfTW ML Condition 3.2.2.4 (CMS) | OfTW CMS |
| OfTW cable installation at the landfall | Disturbance of coastal morphology at the landfall site. | HDD at landfall to minimise effects on the Spey Bay SSSI.<br><br>The offshore end of the HDD will aim to exit as far offshore as is practicable, up to the 6 m LAT contour. In the event that this cannot be achieved, an alternative method of protecting the cable between the HDD exit and the depth of closure will be confirmed and designed to minimise effects on sediment transport patterns and the SSSI. | No additional commitments identified. | OfTW ML Condition 3.2.2.4 (CMS) | OfTW CMS |
| OfTW cable installation at the landfall | Disturbance of coastal morphology at the landfall site. | Visual and/or bathymetric surveys pre- and post-construction at the offshore exit point of the HDD to assess the success of cable burial or the degree of scour around exposed or protected sections.<br><br>Visual and/or topographic surveys pre- and post-construction between the onshore jointing bay and an adjacent point on the beach around or below MLWS, to monitor the actual (naturally occurring) rates of beach morphological change and retreat. | No additional commitments identified. | OfTW ML Condition 3.2.1.1 (PEMP) | PEMP |
| **Benthic Ecology** | | | | | |
| Cable installation | Disturbance to benthic habitat and species | Working areas to be clearly delineated with vessels operating to reduce the area of effect. Where anchors have to be used in water depths <15 m, a Construction Management Plan (CMP) may be used to limit the area of the seabed affected. | Pre-construction Annex I habitats survey to inform cable routing options to minimise direct impacts to Annex I habitats. | OfTW ML Condition 3.2.1.1 (PEMP), 3.2.2.4 (CMS) and 3.2.2.10 (CaP). | PEMP<br><br>Cable Plan (CaP)<br><br>CMS - OfTW |
| Cable installation – vessel movements | Risk of introduction of non-native species | No specific mitigation or monitoring proposed. | Development of an EMP detailing appropriate management practices to be implemented. | OfTW ML Condition 3.2.1.2 (EMP) | EMP |
| Cable installation | Direct release of contaminants to the marine environment | Proper reporting and control of all spillages through all phases of the project should be subject to compliance monitoring. | Development of an EMP that includes pollution prevention measures.<br><br>Development of a MPCP. | OfTW ML Conditions 3.2.1.2 (EMP) and 3.1.12 (MPCP) | EMP<br><br>MPCP |
| **Fish and Shellfish** | | | | | |
| Piling to install OTMs | Piling noise | No specific mitigation or monitoring proposed. | Development of a PS. | OfTW ML Condition 3.2.2.5 (PS) | PS |
| **Marine Mammals** | | | | | |
| Installation of export cable | Physical injury, displacement and disturbance resulting from noise emissions during cable installation. | No specific mitigation or monitoring has been proposed. | An MMMP has been produced to look at noise disturbance during construction (primarily pile-driving) on key species including bottlenose dolphin and harbour seal. | OfTW ML Condition 3.2.1.1 (PEMP), | PEMP |
| Movement of construction vessels | Physical injury/mortality from vessels with ducted propellers and ship strike. | BOWL will work closely with the statutory authorities to further the understanding of the potential risk to grey seals from vessels using ducted propellers.<br><br>Operators of all vessels involved in construction will be made aware of the risks. | BOWL has been monitoring the ongoing research on corkscrew injuries and recent findings suggest that adult grey seals can inflict such wounds and may therefore be a primary cause of such trauma. No specific mitigation or monitoring is therefore proposed, although vessel operators will be made aware of the risks of DP vessels using ducted propellers. | OfTW ML Condition 3.2.2.4 (CMS) and 3.2.2.8 (VMP | CMS<br><br>VMP |
| **Marine Archaeology** | | | | | |
| Installation of OTMs and export cable | Direct physical effects from cable installation (e.g. trenching and cable laying) | Archaeological Exclusion Zones (AEZs) to avoid damage to or loss of an asset. Sites of a high potential have been | Development of a WSI and PAD. | OfTW ML Condition 3.2.2.16 (PAD) | WSI & PAD |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| Installation of OTMs and export cable | Indirect physical effects (e.g. changes to the sediment regime within the area.) | assigned AEZs with a radius of 100 m and sites of medium potential have been assigned AEZs with a radius 0f 50 m.<br><br>Protocol for Archaeological Discoveries (PAD).<br><br>Anchor patterns will be designed to avoid AEZs.<br><br>Marine Archaeological WSI and PAD to be followed during installation. | | | |
| Installation of OTMs and export cable | Secondary physical effects on sites within the cable route corridor and within a 1 km buffer. | | | | |
| **Commercial Fisheries** | | | | | |
| Installation of OfTW cable / cable protection | Complete loss or restricted access to traditional fishing grounds | Ongoing consultation with fisheries interests to minimise, where possible, the effect of construction activities that will result in the temporary loss of fishing grounds. | Development of a CFMS and participation in the Moray Firth CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users. | OfTW ML Condition 3.2.1.4 (CFMS) and 3.2.2.13 (FLO) | CFMS<br><br>FLO |
| Installation of OfTW cable / cable protection | Safety issues for fishing vessels | All infrastructure installed during the construction phase will be marked and lit, in line with standard industry practice.<br><br>Safety zones during the construction phase. | Development of a NSP.<br><br>Development of a LMP. | OfTW ML Conditions 3.2.2.9 (NSP), 3.2.2.10 (CaP) and 3.2.2.14 (LMP) | NSP<br><br>LMP<br><br>CaP |
| Installation of OfTW cable / cable protection | Interference with fishing activities (e.g., navigational conflicts arising between fishing vessels and construction vessels) | No specific mitigation or monitoring proposed. | Development of a CFMS and participation in the CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users.<br><br>Development of a NSP. | OfTW ML Condition 3.2.1.4 (CFMS), 3.2.2.9 (NSP), and 3.2.2.13 (FLO) | CMFS<br><br>FLO<br><br>NSP |
| Installation of OfTW cable / cable protection | Obstacles left on the seabed which could result in damage to or loss of fishing gear and a safety hazard | No specific mitigation or monitoring proposed. | Development of an EMP detailing dropped objects procedure. | OfTW ML Condition 3.2.1.2 (EMP) | EMP |
| Installation of OfTW cable / cable protection | Displacement of fishing vessels into other areas | No specific mitigation or monitoring proposed. | Development of a CFMS and participation in the CFWG.<br><br>FLOs appointed to establish and maintain effective communications with fishermen and other sea users. | OfTW ML Condition 3.2.1.4 (CFMS) and 3.2.2.13 (FLO) | CFMS<br><br>FLO |
| **Shipping and Navigation** | | | | | |
| OfTW construction | Vessel routeing (distance, time, fuel cost and collision/ grounding risk): commercial, recreational and fishing vessels | Appropriate liaison to ensure information on the OfTW and special activities is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media<br><br>A Marine Control Centre will monitor AIS and record the movements of ships around the export cable(s) as well as company vessels working at the cable route.<br><br>Where necessary guard vessels or standby boats will be employed to guard specific points. | Development of a NSP. | OfTW ML Condition 3.2.2.9 (NSP) | NSP |
| OfTW construction | Vessel anchoring displacement and dragged anchor: commercial and small vessels (recreation and fishing) | An Anchoring Impact Assessment and a Burial Protection Study will be carried out once detailed design of the OfTW has been completed.<br><br>Export cable(s) will be charted by UKHO on the appropriate scale charts. Potential to note no anchorage over charted cable(s).<br><br>Export cable(s) will be buried or protected, where feasible taking into account fishing and anchoring practices, e.g. rock | Development of a NSP.<br><br>Development of CaP.<br><br>Development of PEMP. | OfTW ML Conditions 3.2.1.1 (PEMP), 3.2.2.9 (NSP) and 3.2.2.10 (CaP) | NSP<br><br>PEMP<br><br>CaP |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| | | dumping, concrete mattresses and trenching (where possible) to a suitable depth.<br><br>Positions of the export cable routes notified to FISHSAFE via Kingfisher Information Services-Cable Awareness (KIS-CA) for inclusion in cable awareness charts and plotters for the fishing industry.<br><br>Periodic and planned surveys of cable routes to monitor burial depths and sea bed mobility.<br><br>A Marine Control Centre will monitor AIS and record the movements of ships around the export cable(s) as well as company vessels working at the cable route.<br><br>Where necessary guard vessels or standby boats will be employed to guard specific points.<br><br>Vessels anchoring in the area can set up alarm zones to warn if an anchor has moved (dragged). | | | |
| OfTW construction | Electromagnetic interference on shipborne equipment | Export cable(s) will be buried or protected, where feasible taking into account fishing and anchoring practices, e.g. rock dumping, concrete mattresses and trenching (where possible) to a suitable depth.<br><br>Periodic and planned surveys of cable routes to monitor burial depths and sea bed mobility. | Development of CaP.<br><br>Development of PEMP. | OfTW ML Conditions 3.2.1.1 (PEMP) and 3.2.2.10 (CaP) | PEMP<br><br>CaP |
| OfTW construction | Search and Rescue operations, including SAR resources transit distance and time | MGN 371 Annex 5 specifies 'Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident.'<br><br>Formulation of an Emergency Response Cooperation Plan (ERCoP) as per MCA template. BOWL will use the draft template created by the MCA to formulate an emergency response plan and site Safety Management Systems, in consultation with the MCA. | Development of NSP. | OfTW ML Condition 3.2.2.9 (NSP) | NSP |
| **Invasive non-native species** | | | | | |
| Physical presence of structures | Possible stepping stone effect for invasive species | No specific mitigation or monitoring proposed. | Development of an EMP detailing appropriate management practices to be implemented.<br><br>Development of PEMP that includes drop-down video survey to investigate potential ecosystem changes. | OfTW ML Condition 3.2.1.1 (PEMP) and 3.2.1.2 (EMP) | EMP<br><br>PEMP |

## Annex 1.3 - Wind Farm Operation Commitments Register

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| **Physical processes** | | | | | |
| Presence of foundations | Introduction of scour effects due to the presence of the wind farm foundations. | Visual or bathymetric surveys pre and post-construction at selected locations within the Wind Farm site (for the development of scour).<br><br>Scour protection of seabed structures where required. | Development of a PEMP, including a scour monitoring strategy.<br><br>Scour protection not currently proposed by BOWL. | S36 Consent Condition 27 (PEMP) | PEMP |
| Presence of inter-array cables and cable protection | Introduction of scour effects due to exposure of inter-array cables and cable protection measures. | Visual or bathymetric surveys pre and post-construction at selected locations within the Wind Farm site (for the development of scour). | No additional commitments identified. | S36 Consent Condition 27 (PEMP) | PEMP |
| **Benthic Ecology** | | | | | |
| Physical presence of infrastructure | Possible stepping stone effect for invasive species | No specific mitigation or monitoring outlined. | Development of an EMP detailing appropriate management practices to be implemented. | S36 Consent Condition 15 (EMP) | EMP |
| **Fish and Shellfish** | | | | | |
| Physical presence of infrastructure | Loss of habitat | BOWL will work with key stakeholders and Marine Scotland to identify any future monitoring programmes considered necessary | Pre- and post-construction sandeel surveys | S36 Consent Condition 27 (PEMP) | PEMP |
| Physical presence of cables | EMFs | Cables will be buried/protected where feasible. In higher voltage cables the metallic sheath will be designed to provide a shield against the main electric field (E) as per design specification standard IEC 60502. | Development of CaP. | S36 Consent Condition 19 (CaP), | CaP |
| **Marine Mammals** | | | | | |
| Movement of operational maintenance vessels | Noise disturbance from maintenance vessels. | No specific mitigation or monitoring has been proposed. | Standard working practices with respect to vessel movements will be implemented to reduce disturbance to marine mammals. | S36 Consent Conditions 16 (VMP) and 17 (OMP) | VMP<br><br>OMP |
| Movement of operational maintenance vessels | Collision risk from maintenance vessels. | No mitigation or monitoring has been proposed. | BOWL has been monitoring the ongoing research on corkscrew injuries and recent findings suggest that adult grey seals can inflict such wounds and may therefore be a primary cause of such trauma. No mitigation or monitoring is therefore proposed, although vessel operators will be made aware of the risks. | S36 Consent Conditions 16 (VMP) and 17 (OMP) | VMP<br><br>OMP |
| Presence of inter-array subsea cables | Behavioural effects arising from EMF. | No specific mitigation or monitoring has been proposed, although cables will be buried/protected where feasible. | No additional commitments identified. | S36 Consent Condition 19 (CaP) | CaP |
| **Birds** | | | | | |
| Presence of the Wind Farm | Barrier effects | Best practice monitoring of bird use within the Wind Farm Site and 4 km buffer will be undertaken: pre-construction, construction and post-construction monitoring in order to identify any changes in bird usage of the Wind Farm site attributable to the Development. | Development of a PEMP: BOWL is the advanced stages of developing an ornithological monitoring strategy with MORL and in consultation with key stakeholders. BOWL commenced pre-construction aerial bird surveys in 2015.<br><br>Development of a LMP.<br><br>Development of a VMP. | S36 Consent Condition 15 16 (VMP), 20 (LMP) and 28 (PEMP) | PEMP<br><br>LMP<br><br>VMP |
| Presence and operation of the Wind Farm | Displacement | | | | |
| Vessel traffic | Displacement | | | | |
| Lighting on turbines | Lighting | | | | |
| Presence and operation of the Wind Farm | Collision | | | | |
| **Seascape, Landscape and Visual** | | | | | |
| Presence of the wind farm | Effects on visual receptors | Embedded mitigation from fewer, larger turbines | Development of DS. | S36 Consent Condition 14 (DS) | DS |
| Presence of the wind farm | Effects on viewpoints | | | | |
| **Marine Archaeology** | | | | | |
| Wind farm operation | Direct physical effects (Direct effects on archaeological sites, features, deposits and artefacts). | Temporary exclusion zones will be implemented to prevent secondary effects resulting from invasive activities, such as cable installation, anchoring or installation of jack-up vessels. Exclusion zones of 100 m will be established around sites identified as being of high sensitivity, while an exclusion zone of a minimum 50 m will be established around those of | Development of a WSI and PAD. | S36 Consent Condition 37 (PAD) | WSI & PAD |
| Maintenance vessel anchoring activities | Secondary physical effects on archaeological sites, features and artefacts (e.g., the effects of anchoring | | | | |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| | of vessels and associated activities during the installation phase). | medium sensitivity.<br><br>Use of dynamic positioning systems for O&M vessels would reduce the need for anchoring and the likelihood of secondary effects to cultural heritage assets. | | | |
| **Commercial Fisheries** | | | | | |
| Physical Presence of Wind Farm | Adverse effects on commercially exploited fish and shellfish populations / Adverse effects on recreational fish populations | There are no mitigation measures, other than cable burial/protection where possible, to reduce adverse effects upon commercial and recreational fish populations during the operation phase.<br><br>See Briefing Note 3: Fish and Shellfish – Wind Farm. | Development of a CaP. | S36 Consent Condition 19 (CaP) | CaP |
| Physical Presence of Wind Farm | Complete loss or restricted access to traditional fishing grounds | A Working Group to be established that facilitates ongoing dialogue with fishermen prior to and during the construction phase. | Development of CFMS through participation in the CFWG. | S36 Consent Condition 32 (CFMS) | CFMS |
| Maintenance activities | Safety issues for fishing vessels | All infrastructure installed during the construction phase will be marked and lit, in line with standard industry practice.<br><br>Safety zones during operation and maintenance/repair activities.<br><br>Post-construction surveys will be undertaken to assess the seabed status to ensure that the seabed is at an appropriate and reasonable standard determined in consultation with the fishing industry for fishing activities to be safely resumed. | Development of LMP.<br><br>Development of NSP.<br><br>Development of CaP. | S36 Consent Conditions 18 (NSP), 19 (CaP) and 20 (LMP) | LMP<br><br>NSP<br><br>CaP |
| Wind farm operation | Obstacles on the seabed post-construction | Protocol for removal of seabed obstacles post-construction. | Development of EMP that includes dropped objects procedure. | S36 Consent Condition 15 (EMP) | EMP |
| Physical Presence of Wind Farm | Displacement of fishing vessels into other areas | A Working Group to be established that facilitates:<br><br>• Ongoing dialogue with fishermen prior to and during the construction phase; and<br>• Protocol for the navigation of wind farm works vessels to and from the site (i.e. agreement of transit lanes to minimise interference to fishing activities). | Development of a CFMS and participation in the Moray Firth CFWG.<br><br>Development of NSP.<br><br>Development of OMP. | S36 Consent Conditions and 17 (OMP), 18 (NSP), and 32 (CFMS) | CFMS<br><br>NSP<br><br>OMP |
| Physical Presence of Wind Farm and maintenance activities | Interference to fishing activities (e.g., navigational conflicts arising between fishing vessels and operation and maintenance vessels) | | | | |
| **Shipping and Navigation** | | | | | |
| Physical presence of Wind Farm | Routeing (distance, time, fuel cost and collision risk): commercial, recreational and fishing vessels | Wind Farm and inter-array cables will be charted by the UKHO.<br><br>Structures to be marked and lit in line with NLB and IALA guidance.<br><br>Appropriate liaison to ensure information is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media.<br><br>Control Centre to monitor AIS and non-AIS vessels by CCTV. Vessels identified in construction areas or safety zones to be identified and contacted. | Development of NSP.<br><br>Development of LMP.<br><br>Development of DSLP.<br><br>Development of OMP. | S36 Consent Conditions 13 (DSLP), 17 (OMP), 18 (NSP), and 20 (LMP) | NSP<br><br>LMP<br><br>DSLP<br><br>OMP |
| Physical presence of Wind Farm | Recreational vessel blade/mast interaction | Lowest point of rotor sweep at least 22 m above MHWS as per MCA recommendations. | Development of DSLP. | S. 36 Consent Condition 13 (DSLP) | DSLP |
| Wind Farm operation | SAR operations, including SAR resources, transit distance and time | Compliance with MGN 371 including Annex 5: “Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident in or around an OREI”. | Development of NSP.<br><br>Development of OMP. | S36 Consent Conditions 17 (OMP) and 18 (NSP) | NSP<br><br>OMP |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| | | ERCoP and Safety Management System. | | | |
| **Aviation** | | | | | |
| Foundation and top side structure installation / operational turbines | Obstruction to aviation activity | Wind Farm will be equipped with a lighting scheme which fulfils the requirements set out in Article 220 of CAP 393 Air Navigation: The Order and the Regulations and as detailed to support winching operations at the wind farm. | Appropriate liaison to ensure information is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media.<br><br>Structures to be marked and lit in line with CAA and DIO policy and guidance.<br><br>Turbine locations and substation platforms will be charted by the UKHO. | S36 Consent Conditions 13 (DSLP), 18 (NSP), and 20 (LMP) | DSLP<br><br>NSP<br><br>LMP |
| Operational turbines | Physical presence affecting instrument approach procedures to HIAL Wick Airport | Rationalising the HIAL Wick Airport instrument flying procedures: removal of the wider approach procedures for Category C and D aircraft. | No additional commitments identified. | N/A | N/A |
| Operational turbines | Physical presence of turbines creating boundary corruption on air traffic control primary surveillance radar at RAF Lossiemouth | BOWL will pursue the use of an emerging technology that satisfies the MOD's requirement for seamless integration and no degradation to the base of radar cover. | Development of an Air Traffic Control Radar Mitigation Scheme (ATC Scheme). | S36 Consent Condition 21 | Air Traffic Control Radar Mitigation Scheme |
| Operational turbines | Physical presence of turbines creating boundary corruption on air traffic control primary surveillance radar at NERL Allanshill | Provide radar infill device technology options. | Development of a Primary Radar<br><br>Mitigation Scheme. | S36 Consent Condition 22 and 23 | Primary Radar Mitigation Scheme |
| Operational turbines | Physical obstruction of turbines affecting the minimum safe altitude (MSA) for helicopter operations | The MSA to be raised as a result of the presence of the Wind Farm. Aviation charts and any other relevant documentation would be updated where necessary to reflect this change. | No additional commitments identified. | N/A | N/A |
| Operational turbines | Physical obstruction of turbines preventing minimum safe operation of Helicopter Main Routes | No mitigation proposed as the MSA is to be raised. | No additional commitments identified. | N/A | N/A |
| Operational turbines | Physical obstruction of turbines affecting helicopter approach and departure procedures to helidecks and emergency evacuations. | A combination of solutions has been agreed with helicopter and platform operators, including a 2.5 km exclusion zone for turbines, offshore substation platforms and meteorological masts around the Beatrice Jacky oil platform. | No WTGs, offshore substation platforms or meteorological masts are to be erected within 2.5 km of Beatrice Alpha, Bravo, Charlie or Jacky Platforms. | S36 Consent Conditions 13 (DSLP) | DSLP |
| **Invasive non-native species** | | | | | |
| Physical presence of structures | Possible stepping stone effect for invasive species | No specific mitigation or monitoring proposed. | Development of an EMP detailing appropriate management practices to be implemented.<br><br>Development of PEMP that includes drop-down video survey to investigate potential ecosystem changes. | S36 Consent Condition 15 (EMP) and Condition 27 (PEMP) | EMP<br><br>PEMP |

## Annex 1.4 - OfTW Operation Commitments Register

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| **Physical processes** | | | | | |
| Exposure of OfTW and cable protection measures | Introduction of scour effects due to exposure of OfTW and cable protection measures. | Consideration of scour protection measures. Design of scour protection will take into account the transition from the scour protection to the natural seabed to minimise secondary scouring.<br><br>Visual and/or bathymetric surveys pre- and post-construction to assess the success of cable burial or the degree of scour around exposed or protected sections. | Development of PEMP, including scour monitoring strategy.<br><br>Development of CaP. | OfTW ML Condition 3.2.1.1 and 3.2.2.10. | PEMP<br><br>CaP |
| Exposure of OfTW and cable protection measures | Disturbance of coastal morphology at the landfall site. | Visual and/or bathymetric surveys pre- and post-construction at the offshore exit point of the HDD to assess the success | | | |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| | | of cable burial or the degree of scour around exposed or protected sections.<br><br>Visual and/or topographic surveys pre- and post-construction between the onshore jointing bay and an adjacent point on the beach around or below MLWS, to monitor the actual (naturally occurring) rates of beach morphological change and retreat. | | | |
| **Fish and Shellfish** | | | | | |
| Physical presence of cables | EMFs | Cables will be buried/protected where feasible. | Development of CaP.<br><br>Development of PEMP including Atlantic salmon monitoring surveys. | OfTW ML Conditions 3.2.1.1 (PEMP) and 3.2.2.10 (CaP). | CaP<br><br>PEMP |
| **Marine Mammals** | | | | | |
| Presence of subsea export cable | Behavioural effects arising from EMF. | No specific mitigation or monitoring has been proposed.<br><br>Cables will be buried/protected where feasible and the use of cable sheathing to reduce the strength of magnetic fields arising from the subsea cable route will be investigated. | Development of CaP. | OfTW ML Condition 3.2.2.10 (CaP) | CaP |
| **Marine Archaeology** | | | | | |
| Presence of OfTW | Direct, indirect and secondary physical effects | N/A | Development of WSI and PAD. | OfTW ML Condition 3.2.2.16 (PAD) | WSI & PAD |
| **Commercial Fisheries** | | | | | |
| Presence of OfTW | Complete loss or restricted access to traditional fishing grounds | Ongoing consultation with fisheries interests to minimise, where possible, the effect of construction activities that will result in the temporary loss of fishing grounds. | Development of a CFMS and participation in the CFWG. | OfTW ML Condition 3.2.1.4 (CFMS) | CMFS |
| Presence of OfTW | Safety issues for fishing vessels | All infrastructure installed during the construction phase will be marked and lit, in line with standard industry practice.<br><br>Safety zones during operation and maintenance/repair activities.<br><br>Post-construction surveys will be undertaken to assess the seabed status to ensure that the seabed is at an appropriate and reasonable standard determined in consultation with the fishing industry for fishing activities to be safely resumed.<br><br>Embedded design mitigation includes cable burial or protection of cable where burial is not feasible. | Development of NSP.<br><br>Development of LMP.<br><br>Development of CaP.<br><br>Development of PEMP. | OfTW ML Conditions 3.2.1.1 (PEMP), 3.2.2.9 (NSP), 3.2.2.10 (CaP) and 3.2.2.14 (LMP) | NSP<br><br>LMP<br><br>CaP<br><br>PEMP |
| **Shipping and Navigation** | | | | | |
| Presence of OfTW | Vessel routeing (distance, time, fuel cost and collision/ grounding risk): commercial, recreational and fishing vessels | Appropriate liaison to ensure information on the OfTW and special activities is circulated in Notices to Mariners, Navigation Information Broadcasts and other appropriate media.<br><br>A Marine Control Centre will monitor AIS and record the movements of ships around the export cable(s) as well as company vessels working at the cable route. | Development of NSP. | OfTW ML Condition 3.2.2.9 (NSP) | NSP |
| Presence of OfTW | Vessel anchoring displacement and dragged anchor: commercial and small vessels (recreation and fishing) | An Anchoring Impact Assessment and a Burial Protection Study will be carried out once detailed design of the OfTW has been completed.<br><br>Export cable(s) will be charted by UKHO on the appropriate scale charts. Potential to note no anchorage over charted cable(s). | Development of NSP.<br><br>Development of PEMP.<br><br>Development of CaP. | OfTW ML Conditions 3.2.1.1 (PEMP), 3.2.2.9 (NSP), and 3.2.2.10 (CaP) | NSP<br><br>PEMP<br><br>CaP |

| Activity | Potential Impact | Mitigation / Monitoring Measures | | Mechanism for implementation | |
|---|---|---|---|---|---|
| | | ES/SEIS | Post-consent updates | Consent Condition | Document or plan |
| | | Export cable(s) will be buried or protected, where feasible taking into account fishing and anchoring practices, e.g. rock dumping, concrete mattresses and trenching (where possible) to a suitable depth.<br><br>Positions of the export cable routes notified to FISHSAFE via Kingfisher Information Services-Cable Awareness (KIS-CA) for inclusion in cable awareness charts and plotters for the fishing industry.<br><br>Periodic and planned surveys of cable routes to monitor burial depths and sea bed mobility.<br><br>A Marine Control Centre will monitor AIS and record the movements of ships around the export cable(s) as well as company vessels working at the cable route.<br><br>Vessels anchoring in the area can set up alarm zones to warn if an anchor has moved (dragged). | | | |
| Presence of OfTW | Electromagnetic interference on shipborne equipment | Export cable(s) will be buried or protected, where feasible taking into account fishing and anchoring practices, e.g. rock dumping, concrete mattresses and trenching (where possible) to a suitable depth.<br><br>Periodic and planned surveys of cable routes to monitor burial depths and sea bed mobility. | Development of PEMP.<br><br>Development of CaP. | OfTW ML Conditions 3.2.1.1 (PEMP) and 3.2.2.10 (CaP) | PEMP<br><br>CaP |
| Presence of OfTW | Search and Rescue operations, including SAR resources transit distance and time | MGN 371 Annex 5 specifies 'Standards and procedures for generator shutdown and other operational requirements in the event of a search and rescue, counter pollution or salvage incident.'<br><br>Formulation of an Emergency Response Cooperation Plan (ERCoP) as per MCA template. BOWL will use the draft template created by the MCA to formulate an emergency response plan and site Safety Management Systems, in consultation with the MCA. | Development of NSP. | OfTW ML Condition 3.2.2.9 (NSP) | NSP |
| **Invasive non-native species** | | | | | |
| Physical presence of structures | Possible stepping stone effect for invasive species | No specific mitigation or monitoring proposed. | Development of an EMP detailing appropriate management practices to be implemented.<br><br>Development of PEMP that includes drop-down video survey to investigate potential ecosystem changes. | OfTW ML Condition 3.2.1.1 (PEMP) and 3.2.1.2 (EMP) | EMP<br><br>PEMP |

## Annex 2 – BOWL EMP Legislation Register

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Consenting | | | |
| Section 36 Consent Electricity Act 1989 | Consent to generate electricity | To operate generating station within UK territorial waters adjacent to Scotland as defined in The Scottish Adjacent Waters Boundaries Order 1999. | Scottish Ministers, acting through MS-LOT. |
| Marine (Scotland) Act 2010 | Consent to place structures on the seabed<br>Conservation and biodiversity | A framework for the development of a new planning system for the marine area and to ensure greater protection for the marine environment and biodiversity. Applies to a number of activities e.g.: removal of materials from the seabed (including structures), deposit of materials during decommissioning, disturbance of the seabed, use of explosives and installation of certain types of cables.<br>For depositing substances or objects and for the construction, alteration or improvement of any works in or over the sea or on or under the seabed (below Mean High Water Springs (MHWS)) including the temporary placement of construction materials and/or disposal of dredged material etc in Scottish Territorial Waters. | |
| Marine and Coastal Access Act 2009 | Consent to place structures on the seabed<br>Conservation and biodiversity | A framework for the development of a new planning system for the marine area and to ensure greater protection for the marine environment and biodiversity. Applies to a number of activities e.g.: removal of materials from the seabed (including structures), deposit of materials during decommissioning, disturbance of the seabed, use of explosives and installation of certain types of cables.<br>For depositing substances or objects and for the construction, alteration or improvement of any works in or over the sea or on or under the seabed (below Mean High Water Springs (MHWS)) including the temporary placement of construction materials and/or disposal of dredged material etc in Scottish Waters beyond the Territorial Sea (Scottish Offshore Waters). | |
| Environmental Assessment | | | |
| The Electricity Works | Requirements for EIA | Transposes portions of the EIA Directive into Scottish law. For any development that comes | |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| (Environmental Impact Assessment) (Scotland) Regulations 2000, as amended | | under sections 36 or 37, application for consent has to be made to the Scottish Ministers. In addition, pursuant to the Regulations, development that is also considered likely to have significant effect on the environment must also be subject to EIA and an Environmental Statement submitted with the application. | |
| The Marine Works (Environmental Impact Assessment) Regulations 2007, as amended | Requirements for EIA | Transposes portions of the EIA Directive into Scottish law. | |
| Conservation of Habitats and Species Regulations 2010 | EC Habitats and Birds Directive | Transpose the requirements of the EC Habitats Directive and EC Birds Directive into national law within Scottish Territorial Waters (up to the 12 nautical mile (NM) territorial waters limit). Provide for the designation and protection of European sites (Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)), the protection of European protected species, and the adaptation of planning and other controls for the protection of European Sites. Consolidation of various amendments to the 1994 Regulations and apply in Scotland to Section 36 applications.<br>Specifies the requirements for a European Protected Species (EPS) Licence. | |
| Conservation (Natural Habitats, &c.) Regulations 1994 | EC Habitats and Birds Directive | Transpose the requirements of the EC Habitats Directive and EC Birds Directive into national law within Scottish Territorial Waters (up to the 12 nautical mile (NM) territorial waters limit).<br>Specifies the requirements for a European Protected Species (EPS) Licence. | |
| Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 | EC Habitats and Birds Directive | Transpose the requirements of the EC Habitats Directive and EC Birds Directive into national law within Scottish Offshore Waters (beyond the 12 nautical mile (NM) territorial waters limit). | |
| The Marine Strategy Framework | Management of human activities in the marine | Outlines a transparent, legislative framework for an ecosystem-based approach to the management of human activities which | |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Directive | environment | supports the sustainable use of marine goods and services. The overarching goal of the Directive is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment. | |
| Convention for the Protection of the Marine Environment of the North-East Atlantic (The OSPAR Convention) | Environmental protection | Regulates international cooperation on environmental protection in the North-East Atlantic, including pollution and assessment of marine environmental quality. | Defra |
| Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (2010) | Protection of marine mammals form piling noise | Outlines a protocol for the mitigation of potential underwater noise impacts arising from pile driving during offshore wind farm construction. Recommends all operations that include pile driving should consider producing an Environmental Management Plan (EMP). | JNCC / SNH |
| Wildlife and Countryside Act 1981 (as amended) | Nature conservation legislation | Protection of wild bird and other animals, prevention of the introduction of non-native species. | SNH, SEPA |
| Wildlife and Natural Environment (Scotland) Act 2011 | Nature conservation legislation | Prevention of the introduction of non-native species, amendments to the Wildlife and Countryside Act 1981.<br>Sets a strong context for preparing and implementing Marine Biosecurity Plans. | |
| Waste and Discharges | | | |
| Environmental Protection Act 1990 | Pollution control | This Act, and associated regulations, introduces a "Duty of Care" for all controlled wastes. Waste producers are required to ensure that wastes are identified, described and labelled accurately, kept securely and safely during storage, transferred only to authorised persons and that records of transfers (waste transfer notes) are maintained for a minimum of two years. Carriers and waste handling sites require licensing. This Act and associated Regulations brought into effect a | SEPA |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| | | system of regulation for “controlled waste”. Although the Act does not apply to offshore activities, it requires operators to ensure that offshore waste is handled and disposed of onshore in accordance with the “Duty of Care” introduced by the Act. | |
| Environmental Protection Act 1990 (Amendment) (Scotland) Regulations 2001 | Pollution control | Transfer of functions of the Environmental Protection Act 1990 from Ministers of the Crown to Scottish Ministers for Scottish matters. | |
| Environment Act 1995 | Pollution control, environmental management. | Establishment of environmental protection agencies in England and Scotland. Provisions for the control of pollution and dealing with contamination. Setting of standards for environmental management. | |
| Controlled Waste (Scotland) Regulations 1992 (as amended) | Controlled waste | Define "Controlled Waste" for the purposes of Environmental Protection Act 1990. Three categories of controlled waste are defined i.e. household, industrial and commercial. | |
| Special Waste (Scotland) Regulations 1996 (as amended) | Hazardous waste | Control of the movements of the most hazardous types of waste. Introduces a new consignment note, a new system of fees is in operation and the mixing of special wastes is expressly prohibited. | |
| Landfill Directive (1999/31/EC) | Waste management | Supplements the requirements of the Waste Framework Directive (2008/98/EC). Prevention and reduction the negative effects of landfilling on the environment as well as any resultant risk to human health. Sets out requirements for the location, management, engineering, closure and monitoring for landfills and requirements relating to the characteristics of the waste to be landfilled. | |
| Waste (Scotland) Regulations 2012 | Waste management and recycling | The regulations introduce a number of important new requirements including the segregation of materials such as glass, metal, plastics, paper and card for recycling. It also introduces the requirement for food businesses to present food waste for collection and a ban on sending segregated materials for incineration or to landfill. Waste contractors | |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| | | must provide services that enable high quality recycling.<br>The drawing up of waste management plans is an obligation of EU Member States and is required by Article 28 of the Waste Framework Directive (WFD) which the Waste (Scotland) Regulations 2012 implement. | |
| The Waste (Meaning of Hazardous Waste and European Waste Catalogue) (Miscellaneous Amendments) (Scotland) Regulations 2015 | Hazardous waste | These regulations include an amendment to the definition of "Waste Directive" / "Waste Framework Directive" to mean Directive 2008/98/EC as amended by Commission Regulation (EU) No 1357/2014 replacing Annex III to Directive 2008/98/EC for the following legislation (amongst others):<br>• Environmental Protection Act 1990;<br>• Special Waste Regulations 1996;<br>• Landfill (Scotland) Regulations 2003. | |
| Waste Management Licensing (Scotland) Regulations 2011 | Waste Management | The regulations dictate the licensing of persons or businesses involved in the management of waste and relate directly to the licensing of a site or activity to carry out the management, processing and disposal of wastes. | |
| The Environmental Protection (Duty of Care) (Scotland) Regulations 2014 | Waste Management | Under these Regulations any person who imports, produces, carries, keeps, treats or disposes of Controlled Waste has a duty to take all reasonable steps to ensure that their waste is handled lawfully and safely. Special/Hazardous Waste is a sub-category of Controlled Waste (see also Special Waste Regulations). | |
| The Waste (Recyclate Quality) (Scotland) Regulations 2015 | Recycling | Requires the holder of a Waste Management Licence to comply with the Materials Recovery Code. Also a Pollution Prevention and Control (PPC) permit for the running of a waste recovery facility must contain a requirement to comply with the Materials Recovery Code. | |
| Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) | Sewage and Garbage treatment, storage and disposal | Implement both the revised Annex IV of MARPOL 73/78 – Regulations for the Prevention of Pollution by Sewage from Ships, and the Annex V of MARPOL 73/78 (including amendments) – Regulations for the Prevention of Pollution by Garbage from Ships. Implements into UK law international | MCA |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Regulations 2008 | | regulations on treatment and disposal of garbage and food waste from vessels operating in UK water.<br>All ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons must carry a Garbage Management Plan and a Garbage Record Book. The regulations also provide powers for the MCA to issue an International Sewage Pollution Prevention Certificate to ships in the same categories. | |
| International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004 | Ballast water management | Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens though control and management of ships' ballast water and sediments. Under this regulation, all tankers > 150 GRT and all ships (including submersibles, floating craft & floating platforms) > 400 GRT (unless not engaged in international voyages or as exempted under the regulations) in the UK are required to have a Ballast Water Exchange Management Plan and a Ballast Water Record Book and to be surveyed and issued with an International Ballast Water Management Certificate. | MCA |
| The Merchant Shipping (Anti-Fouling Systems) Regulations 2009 | Anti-fouling<br>Pollution prevention | Prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems and places into UK law Regulation (EC) 782/2003 on the prohibition of organotin compounds on ships.<br>Provides powers for the MCA to issue an International Anti-fouling System Certificate to ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons. | MCA |
| Food & Environmental Protection Act (FEPA) 1985 (with amendments) Deposits in the Sea (Exemptions) Order 1985 | Discharges | Used to cover the discharge or placement of substances or articles in the sea or on the seabed where the deposits could not be covered by other legislation (e.g. Marine (Scotland) Act, 2010). A licence is required under FEPA for any waste disposal in the sea or under the seabed. The Deposits in the Sea (Exemptions) Order 1985 exempts from FEPA licensing the deposit on site or under the seabed of any chemicals and drill cuttings. | DECC |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Control of Substances Hazardous to Health Regulations 1994 COSHH | Control of substances hazardous to health | Assessment, prevention or control of exposure and monitoring of substances hazardous to health. | HSE |
| The REACH Enforcement Regulations 2008 | Chemical usage | These enforce Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) which require chemical users to demonstrate the safe manufacture of chemicals and their safe use throughout the supply chain. Under REACH, the users of chemicals as well as their manufacturers and importers have a responsibility to ensure that the risks to both human health and the environment are adequately assessed. | DECC, Marine Scotland |
| Decommissioning | | | |
| Energy Act 2004 | Decommissioning requirements | Introduced a decommissioning scheme for offshore wind and marine energy installations. Under the terms of the Act, the Secretary of State may require a person who is responsible for one of these installations or lines to submit (and eventually carry out) a decommissioning programme for them. | DECC |
| Physical Presence | | | |
| Energy Act 2004 | Safety zones | Section 95 of and Schedule 16 to the Energy Act 2004 set out the basic requirements for applying to the Secretary of State for a safety zone to be placed around or adjacent to an offshore renewable energy installation. Following public consultation the Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007, which set out the process to be followed in more detail, were introduced in August 2007. | DECC |
| Marine (Scotland) Act 2010 | Obstruction to navigation | This Act provides that where an obstruction or danger to navigation is caused, or is likely to result, the prior written consent of Scottish Ministers is required for the siting of the offshore installation - whether mobile or permanent – in Scottish Territorial Waters. | Scottish Ministers, acting through MS-LOT. |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Marine and Coastal Access Act 2009 | Obstruction to navigation | This Act provides that where an obstruction or danger to navigation is caused, or is likely to result, the prior written consent of Scottish Ministers is required for the siting of the offshore installation – whether mobile or permanent – in Scottish Offshore Waters. | |
| Pollution Control | | | |
| The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996 | Prevention of oil pollution | These Regulations give effect to Annex I of MARPOL 73/78 (prevention of oil pollution) in UK waters. They address oily drainage from machinery spaces on vessels and installations and sets limits for the levels of oil in discharged water from these sources.<br>Vessels and installations are required to hold a valid Oil Pollution Prevention Certificate.<br>Vessels are also required to hold a current, approved Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with guidelines issued by the International Maritime Organisation (IMO). Oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above are required carry an Oil Record Book to record when specific operations take place on board which have the potential to lead to oil pollution from vessels and an approved Shipboard Oil Pollution Emergency Plan (SOPEP). | DECC, Marine Scotland |
| Bonn Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances (2004) | Prevention of oil pollution<br>Pollution protection | An agreement to combat oil pollution and to stimulate active cooperation and mutual assistance among states bordering the North Sea in case of casualties or other incidents at sea that are of great concern for the protection of the coasts and related interests. | DECC, Marine Scotland |
| The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007 | Carriage of dangerous goods | Implements the requirements of the European agreement concerning the carriage of dangerous goods (ADR), including safe storage and transport by road rail and sea. | DfT |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Marine Management Organisation (MMO) (2014) Approved oil spill treatment products | Oil spill response | Quick reference list of products approved for use on the UK Continental Shelf | MMO, Marine Scotland |
| Marine Safety Agency (MSA) (1996) Merchant Shipping Notice No. M.1663, Vessels Engaged in Oil Recovery | Oil spill response | Provides guidelines for the design, construction, ship's equipment and operation of offshore support vessels, which may be required to have the capability of handling, storing and transporting oil recovered from a spill in emergency situations. | MSA |
| The Merchant Shipping (Ship-To-Ship Transfers) Regulations 2010 (as amended) | Refuelling operations<br>Cargo transfers | Bring in controls on ship-to-ship transfers in UK waters, including prohibiting ship-to-ship transfers and bunkering operations outside harbour authority waters and put in place a legislative regime for assessing and licensing harbour authorities which propose to allow ship-to-ship transfers in their waters.<br><br>Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended). An exemption is provided in MSN 1829 for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling. | MCA |
| The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998 (OPRC Regulations) | Oil spill | The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998 introduce into UK law the oil spill planning requirements and legal oil spill reporting requirements of the OPRC Convention. | DECC, Marine Scotland |
| The Merchant | Pollution | Provides for the application of the ISM Code on | MCA |

| Legislation | Relevance to BOWL | Summary | Regulatory Body |
|---|---|---|---|
| Shipping (ISM Code) Regulations 2014 | prevention | all vessels to which the SOLAS Convention applies and to other vessels to which EC regulations apply. The ISM Code provides an international standard for the safe management and operation of ships and for pollution prevention. | |

## Annex 3 – BOWL EMP Contacts Directory

The following sets out the template list for EMP contacts; the list will be finalised once all relevant contacts are identified and circulated to all relevant personnel.

| Organisation | Contact | Telephone (office hours) | Fax | 24 hr. Telephone | Mobile / Pager / Email |
|---|---|---|---|---|---|
| BOWL | | | | | |
| Marine Coordinator | | | | | |
| Site Manager | | | | | |
| Project Manager | | | | | |
| SHE Manager | | | | | |
| Project Director | | | | | |
| Offshore SHE Manager | | | | | |
| SSE 24 HR Emergency Service | | | | | |
| CLT | | | | | |
| ECoW | | | | | |
| BOWL Key Contractors | | | | | |
| Marine Installation | | | | | |
| WTG | | | | | |
| Transmission | | | | | |
| MS-LOT/Licensing Authority | | | | | |
| MS-LOT/ Licensing Authority | | | 01224 295524 | | |
| Ports and Coastguard | | | | | |
| Port of Wick | Harbour Master | | | | |

| Organisation | Contact | Telephone (office hours) | Fax | 24 hr. Telephone | Mobile / Pager / Email |
|---|---|---|---|---|---|
| Environmental Agencies and Local Authorities | | | | | |
| SEPA | Pollution hotline | - | - | 0800 80 70 60 | - |
| SNH | National Oil Spill Officer | 0131 3162610 | 0131 3162690 | | 07774 161273 (mobile)<br>07699 761509 (Pager) |
| JNCC | Oil spill notifications | 01224 266556 | 01224 896170 | 07974257464 | pollutionadvice@jncc.gov.uk |
| Moray Council | Emergency contact | | | 08457 565656 | |
| Highland Council | Emergency Planning Team | 01463 713479 | 01463 243583 | 01463 713479 | epu@highland.gov.uk |
| Aberdeenshire Council | | | | | |
| Other Contacts (for possible information and advice) | | | | | |
| RSPB | - | 01767 693690 | - | - | - |

## Procedures and Proformas

## Annex 4 – BOWL ECoW Monthly Compliance Report Proposed Template

| | |
|---|---|
| ***Beatrice Offshore Wind Farm*** | |
| ***Monthly ECoW Compliance Report*** | |
| *Reporting Period:* | |
| Report prepared by: | *Insert ECoW name and contact details.* |
| Date of Report: | *Insert date report submitted* |
| ***Other Contributors:*** | |
| BOWL CLT | |
| Contractors: | |
| Archaeological Consultant: | |
| Fisheries Liaison Officer: | |

| **Section 1 – Summary of Construction Activities in [INSERT REPORTING PERIOD]** | |
|---|---|
| **Component** | **Description of activities** |
| Preparatory works | *Provide list of activities, e.g., vessel mobilisation, major component deliveries, route clearance and pre-lay grapnel runs.* |
| Foundations (including OTM foundations) | ***Piling*** |
| | • *Number of piles installed and location.* |
| | ***Jacket installation*** |
| | • *Number installed and location.* |
| Cables | ***Inter-array*** |
| | • *Include details of any cable laying or protection activities.* |
| | ***OfTW*** |

| | |
|---|---|
| | • *Include details of any cable laying or protection activities.* |
| Wind turbines | • *Number installed and location.* |

| **Section 2 – Summary of Environmental Management Issues Arising in [INSERT REPORTING PERIOD]** | | | |
|---|---|---|---|
| **Date** | **Construction Activity** | **Description of Environmental Management Incident or issue** | **Corrective Action Taken** |
| | | | |
| | | | |
| | | | |
| | | | |
| Any other relevant comments in relation to environmental management measures in the reporting period | *e.g. areas of non-compliance, suggested amendments, improvements made or lessons learned etc* | | |

| **Section 3 – Summary of Pollution Incidents Arising in [INSERT REPORTING PERIOD]** | | | |
|---|---|---|---|
| **Date** | **Construction Activity** | **Description of Pollution Event** | **Corrective Action Taken and Status** |
| | | | |
| | | | |
| | | | |
| | | | |
| Any other relevant comments in relation to pollution prevention or planning in the reporting period | *e.g. near misses, areas of non-compliance, suggested amendments, improvements made or lessons learned etc* | | |

| **Section 4 – Summary of Notifications Issued in [INSERT REPORTING PERIOD]** |
|---|

| Date | Main Activity | Notices issued | Issued to |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

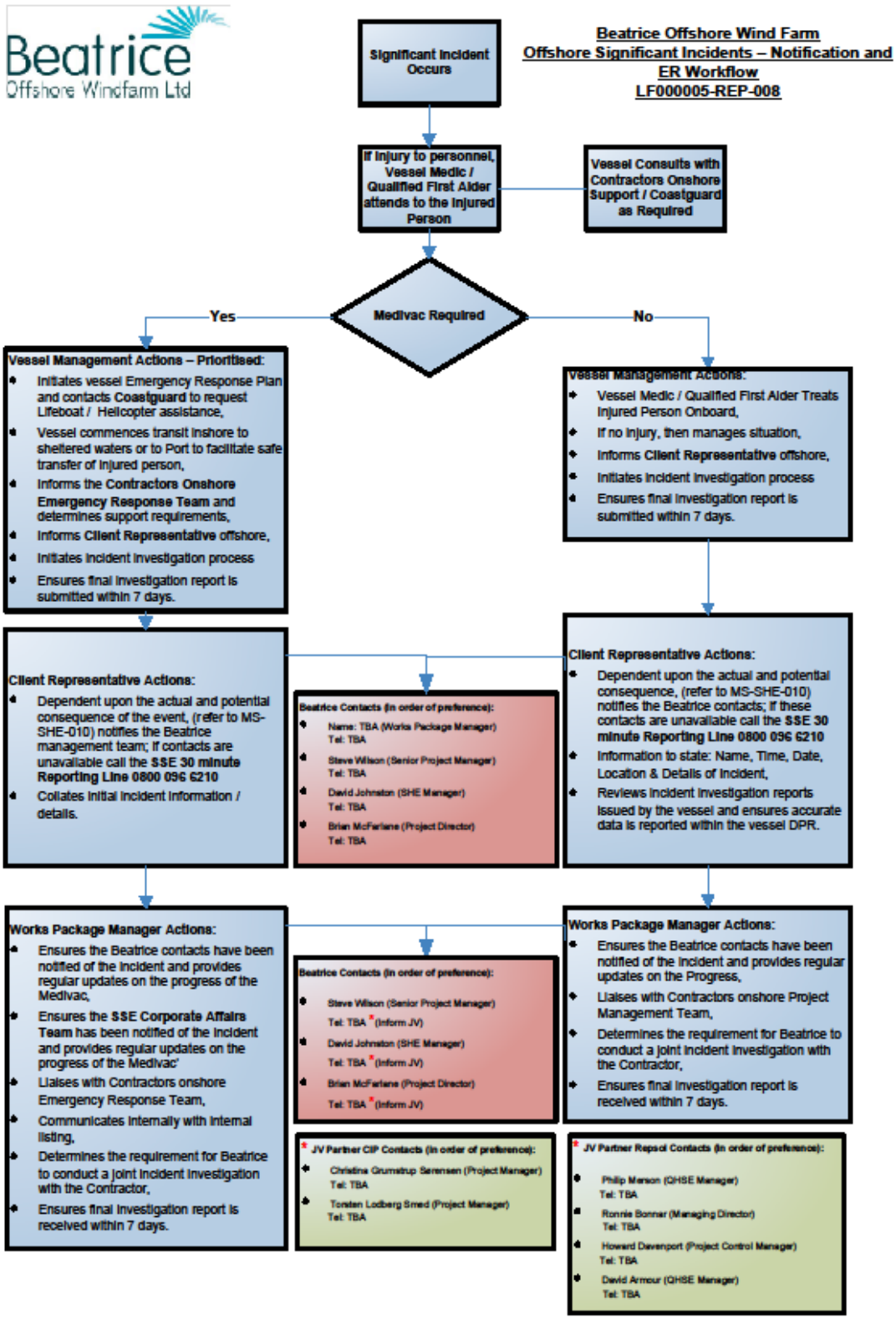
Copies of NtoMs or other notifications should be provided separately

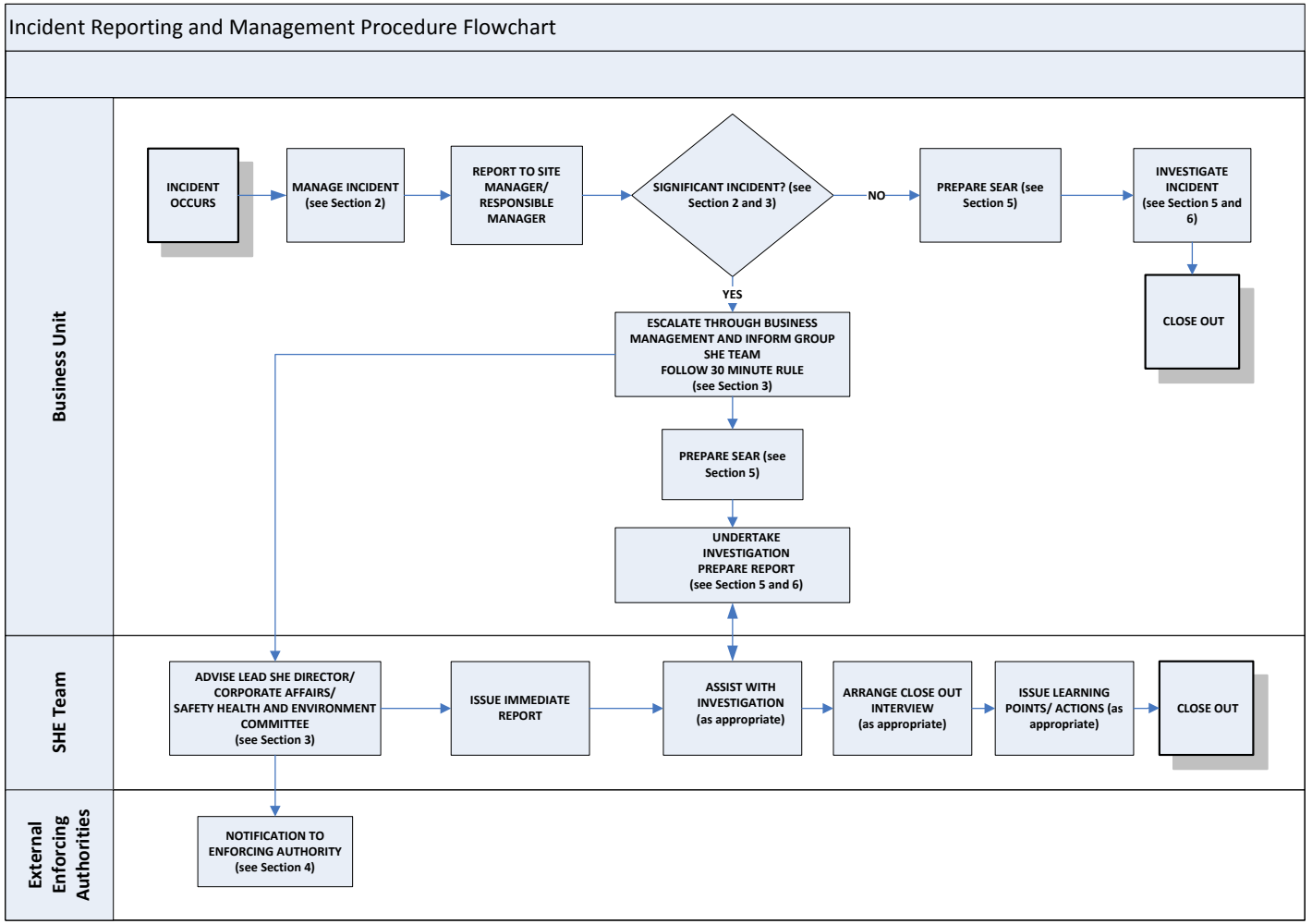
| **Section 5 – Summary of Construction Activities Planned for [INSERT NEXT REPORTING PERIOD]** | |
|---|---|
| **Component** | **Description of activities** |
| Preparatory works | *Provide list of planned activities, e.g., vessel mobilisation, major component deliveries, route clearance and pre-lay grapnel runs.* |
| Foundations (including OTM foundations) | ***Piling*** |
| | • *Number of piles planned and location.* |
| | ***Jacket installation*** |
| | • *Number planned and location.* |
| Cables | ***Inter-array*** |
| | • *Include details of any planned cable laying or protection activities.* |
| | ***OfTW*** |
| | • *Include details of any planned cable laying or protection activities.* |
| Wind turbines | • *Number planned and location.* |

| **Section 6 – Construction Programme Updates** |
|---|
| *Highlight any changes to anticipated scheduling of works in the previous month or coming month.* |

| **Section 7 - Additional Information related to environmental management measures from [INSERT REPORTING PERIOD]** |
| --- |
| *Append any additional information relevant to ECoW compliance and EMP reporting including e.g. details of ECoW inspections, inductions and audits completed in the preceding month in respect of the CMS, EMP (& MPCP), PEMP, PS. CaP and VMP.* |

## Annex 5 - BOWL and SSE Incident Reporting Procedures (excluding oil spills)




Incident Reporting and Management Procedure Flowchart
Business Unit
INCIDENT OCCURS
MANAGE INCIDENT (see Section 2)
REPORT TO SITE MANAGER/ RESPONSIBLE MANAGER
SIGNIFICANT INCIDENT? (see Section 2 and 3)
NO
PREPARE SEAR (see Section 5)
INVESTIGATE INCIDENT (see Section 5 and 6)
CLOSE OUT
YES
ESCALATE THROUGH BUSINESS MANAGEMENT AND INFORM GROUP SHE TEAM FOLLOW 30 MINUTE RULE (see Section 3)
PREPARE SEAR (see Section 5)
UNDERTAKE INVESTIGATION PREPARE REPORT (see Section 5 and 6)
SHE Team
ADVISE LEAD SHE DIRECTOR/ CORPORATE AFFAIRS/ SAFETY HEALTH AND ENVIRONMENT COMMITTEE (see Section 3)
ISSUE IMMEDIATE REPORT
ASSIST WITH INVESTIGATION (as appropriate)
ARRANGE CLOSE OUT INTERVIEW (as appropriate)
ISSUE LEARNING POINTS/ ACTIONS (as appropriate)
CLOSE OUT
External Enforcing Authorities
NOTIFICATION TO ENFORCING AUTHORITY (see Section 4)

## Annex 6 – BOWL Waste Management Procedures

| | |
|---|---|
| Project Title/ Location | Beatrice Offshore Wind Farm |
| Project Reference Number | LF0000005 |
| Date: | July 2015 |

# Beatrice Offshore Wind Farm

# EMP Annex 6 -

# Waste Management Measures



| Rev | Prepared By | Sign Off | Checked By | Sign Off | Approved By | Sign Off | Date of Issue |
|---|---|---|---|---|---|---|---|
| 04 | GoBe Consultants Ltd | | BOWL | | BOWL | | 27//07/15 |
| 03 | GoBe Consultants Ltd | | BOWL | | | | |
| 02 | RPS | | RPS | | | | |
| 01 | RPS | | RPS | | | | |

*[Page intentionally left blank]*

## Table of Contents

## List of Abbreviations and Definitions

| Term | Description |
|---|---|
| Audit | Inspection to confirm compliance, and identify and correct non-compliance. |
| BOWL | Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ. |
| the (S36) Consent | The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014. |
| CMS | The Construction Method Statement as required for approval under S36 Consent Condition 11 and OfTW Marine Licence Condition 3.2.2.4. |
| Consent Conditions | The terms that are imposed on BOWL under the S36 or Marine Licence Consent that must be fulfilled throughout the period that the Consent is valid. |
| Construction | As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004. |
| COSHH | Control of Substances Hazardous to Health. |
| Development | The Wind Farm and the OfTW. |
| EMP | The Environmental Management Plan as required for approval under Condition 15 of the s36 consent and Condition 3.2.1.2 of the OfTW Marine Licence |
| EU | European Union. |
| IMDG | International Maritime Dangerous Goods. |
| Inter-array cables | The AC electrical cables that connect the WTGs to the OTMs. |
| Key Contractors | The Contractors appointed for the individual worksteams of Marine Installation; Transmission; and WTGs |
| LoW | List of Waste. |
| Marine Licences | The written consents granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which were issued on 2 September 2014. |

| Term | Description |
|---|---|
| MARPOL 73/78 | International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978. |
| O&M | Operation and Maintenance. |
| OfTW | The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast. |
| On-site | On-site means within the boundaries of the Wind Farm and OfTW as defined within the Section 36 Consent and the Marine Licences. |
| OTM | Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator. |
| POPs | Persistent Organic Pollutants. |
| SDS | Safety Data Sheet. |
| SEPA | Scottish Environment Protection Agency. |
| Subcontractor | Subcontractors to the Key Contractors. |
| UN | United Nations. |
| VMP | The Vessel Management Plan as required for approval under Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence. |
| WFD | Waste Framework Directive. |
| Wind Farm | The offshore array development as assessed in the ES including wind turbines, their foundations, inter-array cabling and meteorological masts. |
| WMP | Waste Management Plan. |

# 1 Introduction

## 1.1 Overview and Purpose

1.1.1 This document has been prepared by Beatrice Offshore Windfarm Ltd (BOWL) to set out waste management measures for the construction and operational phases of the Beatrice Wind Farm and Offshore Transmission Works (OfTW) ("the Development"). This document covers waste associated with the offshore elements of the Development only. It considers the type and volume of waste that is likely to be generated, presents the options for the management of this waste and identifies waste management facilities in the vicinity of the Development.

1.1.2 The purpose of this document is to set out the measures to minimise, recycle, reuse and dispose of waste streams generated offshore during the construction and operational phases of the Development, in compliance with relevant waste legislation.

1.1.3 This document sets out the general principles for waste management that all BOWL personnel, Key Contractors and Subcontractors shall comply with.

1.1.4 All BOWL contractors and vessels will be required to prepare for BOWL approval and implement their own Waste Management Plans (WMPs) and Vessel Garbage Management Plans (where applicable) in line with standard practice.

## 1.2 Background

1.2.1 The Beatrice Wind Farm received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 19 March 2014 (the S36 Consent) and was issued two Marine Licences from the Scottish Ministers, for the Wind Farm and OfTW respectively, in September 2014 ("the Marine Licences").

1.2.2 Condition 15 of the S36 Consent and Condition 3.2.1.2 of the OfTW Marine Licence require that an EMP is prepared, to provide the overarching framework for on-site environmental management during the construction and operational phases of the Development. The condition specifically requires that the EMP addresses:

*Measures to minimise, recycle, reuse and dispose of waste streams*

## 1.3 Project Description

1.3.1 The Development will consist of the following main components:

- A total generating capacity of up to 588MW;
- Up to 84 wind turbines of 7MW rated generating capacity;
- Jacket foundations each installed on four piles driven into the seabed;
- Two AC substation platforms, referred to as offshore transformer modules

(OTMs) to collect the generated electricity and convert the electricity from 33kV to 220kV for transmission to shore;

- A network of circa 170 to 190km of inter-array, buried, subsea cables to connect strings of turbines together and to connect the turbines to the OTMs;
- 2 buried, subsea export cables, totalling circa 130km in length, to transmit the electricity from the OTMs to the land fall at Portgordon and connecting to the onshore buried export cables for transmission to the onshore substation and connection to the National Grid network; and
- Minor ancillary works such as the deployment of met buoys.

1.3.2 There are no accommodation platforms associated with the Development, however it should be noted that each OTM will include emergency accommodation and welfare facilities. The waste streams arising from these project components are considered within Section 4 of this document.

1.3.3 A number of installation vessels will be required during the construction phase (for more details refer to the CMS and VMP).

1.3.4 Operational and maintenance (O&M) activities will also require vessel and/or helicopter attendance at the site.

1.3.5 The waste streams arising from vessel activities are considered within Section 4of this document.

### 1.4 Structure of the document

1.4.1 This document is structured as follows:

- Section 2: outlines the waste regulatory framework;
- Section 3: outlines roles and responsibilities with respect to waste management;
- Section 4: describes waste arisings, e.g., the types of waste that will be generated; and
- Section 5: sets out waste management measures with reference to the waste hierarchy.

# 2 Regulatory Framework

## 2.1 Definition of Waste

2.1.1 For the purpose of this document the definition of "waste" is taken from Article 3(1) of the revised European Waste Framework Directive (WFD) (2008/98/EC), which states that waste is "*any substance or object which the holder discards or intends or is required to discard*".

2.1.2 "Discard" includes the recovery and recycling of a subject or object as well as its disposal. The decision on whether something is discarded must take account of all the circumstances (for example, the nature of the material, how it was produced and how it will be used) and have regard to the aims of the WFD, which include "*the protection of human health and the environment against harmful effects caused by the collection, transport, treatment, storage and tipping of waste*".

## 2.2 Legislation and Guidance

2.2.1 The legislative framework for the management of construction and operational wastes associated with the Development is set out in Annex 2 of the main EMP: Legislation Register (Document Reference LF000005-PLN-144 – Annex 2).

2.2.2 Relevant policy and guidance documents also include:

- Duty of Care Code of Practice 2012;
- SEPA guidance on the production of Site Waste Management Plans 2010;
- UK Marine Policy Statement 2011; and
- Zero Waste Scotland 2010.

2.2.3 The key driver for waste management legislation in the UK, when onshore disposal is required, is the WFD. The Directive is transposed into UK legislation by the Waste (Scotland) Regulations 2012 SSI 148; Waste Management Licensing (Scotland) Regulations 2011 SSI 228 and the Environmental Protection (Duty of Care) (Scotland) Regulations 2014 SSI 4. These regulations require all businesses and organisations that produce waste to take all reasonable measures to prevent waste, and to apply the waste hierarchy (refer to Section 5.1) when managing waste.

2.2.4 In terms of waste generated offshore, the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Annex IV (sewage) and Annex V (garbage) is the main legislative driver. Under the Convention, the North Sea is designated as a Special Area where the disposal of any waste (except food waste) offshore is prohibited. The Convention is transposed into UK legislation by the Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008, which places a number of obligations on vessels in terms of managing waste.

2.2.5 The Special Waste (Scotland) Regulations 1996 SI 972 set out the requirements for the preparation of Consignment Notes for the handling and carriage of special waste (including hazardous waste) as defined within the regulations. The regulations provide the requirements for the removal of ships' waste to reception facilities and also the avoidance of mixing waste streams.

### 2.3 Key Obligations

**Duty of Care**

2.3.1 A key requirement of Section 34 of the Environmental Protection Act 1990 is that the waste producer is responsible for ensuring that their waste is collected by an appropriately licensed waste carrier and managed at a suitably licensed facility. Section 34 of the Environmental Protection Act 1990 (as amended) lays out number of duties with respect to the management of waste. The Waste (Scotland) Regulations 2012 amended Section 34 to implement a number of actions in the Scottish Government's Zero Waste Plan (2010). The Duty of Care: A Code of Practice (Scottish Government, 2012) explains these duties which apply to anyone who produces, keeps, imports or manages controlled waste in Scotland.

2.3.2 In accordance with MARPOL (73/78) Annex V (as amended) every ship (certified to carry 15 persons or more), and vessel (of 400 gross tonnage and above) involved in the construction or operation of the Development will have a **Garbage Management Plan**. The plan will include procedures for the collection, storage, processing and disposal of all waste, and will designate an individual responsible for implementing the plan. Waste types and volumes generated by the vessel/installation will be recorded in a **garbage record book**. Once the waste is brought onshore it will be managed in accordance with the duty of care legislation (see above). Information from the garbage record book will be used to complete the relevant Waste Transfer Notes. Under the International Convention for the Control and Management of Ships' Ballast Water and Sediments, all ships over 400 GRT in the UK are required to have a **Ballast Water Exchange Management Plan.** These requirements are summarised in Table 2.1 below.

2.3.3 BOWL will commission vessel audits (see also the VMP) as required to ensure compliance before a vessel is allowed to enter the construction area, and further monitoring will be executed to ensure continued compliance.

**Table 2.1: Summary of Vessel Waste Management Requirements**

| Legislation | Summary | Relevant requirement |
|---|---|---|
| Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008 | Implements revised Annex IV of MARPOL 73/78 – Regulations for the Prevention of Pollution by Sewage from Ships, and Annex V of MARPOL 73/78 (including amendments) – Regulations for the Prevention of Pollution by Garbage from Ships.<br>Implements into UK law international regulations on treatment and disposal of garbage and food waste from vessels operating in UK water.<br>All ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons must carry a **Garbage Management Plan** and a **Garbage Record Book**. The regulations also provide powers for the MCA to issue an **International Sewage Pollution Prevention Certificate** to ships in the same categories. | Garbage Management Plan<br>Garbage Record Book<br>International Sewage Pollution Prevention Certificate |
| International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004 | Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens though control and management of ships' ballast water and sediments. Under this regulation, all vessels are required to have meet the ballast water performance standard. Vessels entering the North East Atlantic to exchange the ballast water at least 200 nm from the nearest land and at least 200 metres deep. | Compliance with the Ballast Water Performance Standard |

2.3.4 Food waste from vessels will be ground or comminuted to the required size in accordance with the Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008 prior to disposal at sea. Some vessels will have sewage treatment facilities, which will treat the sewage prior to discharging to the sea in accordance with MARPOL (73/78) Annex IV. Where treatment facilities are not available, sewage will be brought ashore for treatment.

2.3.5 Once brought ashore, waste materials arising from the construction and operation of the Development will only be transported by registered waste carriers and special waste carriers currently published on SEPA's online public registers. Waste materials removed from the construction site will be accompanied by a Waste Transfer Note (or special waste Consignment Note as appropriate), which correctly describes the waste using the European Waste Catalogue code, identifies the waste carrier and details where the waste will be transported. Requirements for transferring waste and registered waste carriers are set out in regulation 3, 4, 5 and 6 of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014.

# 3 Roles and Responsibilities

## 3.1 Introduction

3.1.1 The key roles and associated responsibilities with regard to implementing waste management measures are outlined below.

## 3.2 BOWL

3.2.1 BOWL will be responsible for requiring that waste management measures are implemented effectively, alongside wider BOWL environmental commitments (as detailed in the main EMP document).

3.2.2 BOWL will review contractor EMPs to ensure compliance with the overarching BOWL EMP and this associated Annex.

3.2.3 BOWL will be responsible for reviewing and updating this document (where necessary) (see the main EMP document).

## 3.3 Key Contractors

3.3.1 The Key Contractors have overall responsibility for:

- Ensuring that all procedures in this document are followed;
- Ensuring that all their Subcontractors are suitably qualified and experienced in implementing the measures within this document, and that all procedures in this document are followed; and
- Ensuring that all legal and contractual requirements relating to waste management are met by ensuring adequate plans/procedures, licences and certificates are in place, and that they can be achieved.

3.3.2 Key Contractors and vessels will be required to implement their own Waste Management Procedures (WMPs) and vessel Garbage Management Plans (where applicable) as per standard practice.

## 3.4 Subcontractors

3.4.1 All Subcontractors (i.e., Subcontractors to the Key Contractors) must comply with the general principles for waste management set out in this document. All Subcontractors and vessels will be required to implement their own WMPs and vessel Garbage Management Plans (where applicable) as per standard practice.

# 4 Waste Arisings

## 4.1 Waste Types

4.1.1 The potential waste streams generated by the construction and operation of the Development can be subdivided into three categories:

- Inert;
- General (non-hazardous); and
- Hazardous.

4.1.2 The European Waste Catalogue Codes to which anticipated likely waste types are assigned for classification purposes are provided in **Appendix A** and the criteria for determining whether a material is considered hazardous waste are provided in **Appendix B**.

4.1.3 Non-hazardous wastes are accepted at SEPA regulated non-hazardous or inert licenced landfill sites whilst hazardous wastes are accepted at hazardous licenced landfill sites within Scotland.

4.1.4 Any unidentified wastes must be treated as hazardous and stored separately from other wastes pending identification and classification.

4.1.5 Each category of waste is further described in the following sections.

**Inert Waste**

4.1.6 Inert waste is defined by the Waste Management Licensing Amendment (Scotland) Regulations 2003 as not capable of undergoing significant physical, chemical or biological transformations. Also, inert waste should not dissolve, burn or physically, chemically or biodegrade, subsequently leading to environmental pollution or harm to human health. Finally, any total leachability and pollutant content and ecotoxicity of leachate should be insignificant and not endanger groundwater or surface water.

**General (Non Hazardous) Waste**

4.1.7 Putrescible solids include sewage, grey water and kitchen waste. The only wastes that can be discharged offshore are sewage, grey water and kitchen waste, which have been suitably treated to International Convention for the Prevention of Pollution from Ships (MARPOL) standards (MARPOL 73/78 Annex IV Regulation 11 and Annex V Regulation 4).

4.1.8 General non-hazardous solid wastes include scrap materials, packaging, wood, paper and empty containers.

**Hazardous Waste**

4.1.9 Technical guidance on the interpretation of the WFD definition and classification of hazardous waste versus non-hazardous waste is provided by the Joint Agency technical guidance (WM2): Hazardous Waste (2013) and draft guidance, in preparation, (WM3) Draft Waste Classification (2015). The draft guidance describes a six step approach that SEPA will adopt in determining whether to regulate materials as special waste (see below). The properties of hazardous waste are also provided in **Appendix B**.

- **Step 1:** Is the waste "Directive waste" as defined by the WFD or required to be included as a potential hazardous waste based on domestic legislative provisions?
- **Step 2:** How is the waste classified on the List of Waste (LoW)?
- **Step 3:** Are the substances in the waste known or can they be determined?
- **Step 4:** Are there “hazardous substances” or “Persistent Organic Pollutants” in the waste?
- **Step 5:** Does the waste display any of the hazard properties H1 to H15 described within the guidance (and Annex III of the WFD)?
- **Step 6:** Does the waste contain POPs above the specified concentration limits?

4.1.10 The guidance enables the classification of waste streams as either hazardous or non-hazardous. An assessment of appropriate disposal routes can then be made, including landfill as final disposal option, according to appropriate landfill waste acceptance criteria.

4.1.11 If a risk or hazard is identified in a product data sheet, through COSHH or Safety Data Sheet (SDS), the waste should be assumed to be Hazardous Waste.

4.1.12 Packaging and containers associated with hazardous materials shall themselves be treated as hazardous waste until such time as they have been satisfactorily cleaned.

4.1.13 It is important to note that some hazardous items are also currently recycled (e.g., lead acid batteries) but are listed as hazardous as a result of the potential impact on the environment (e.g., from inappropriate handling or disposal). For these products the hazardous waste transportation measures also apply.

## 4.2 Estimated Waste Arisings

4.2.1 The potential waste streams associated with the construction and operation of the offshore elements of the Development will be estimated by all Contractors and subcontractors as part of their waste management procedures.

4.2.2 An example of the format in which contractors will be required to estimate waste streams is in **Appendix C**, which describes predicted volumes and proposed target for re-use/recycling for waste produced from wind turbine installation activities.

4.2.3 In the case of construction and operational vessels, the following list provides an example of hazardous waste typically generated by a construction vessel:

- Waste Paint and Paint thinners;
- Waste oil;
- Oiled waste, including oil filters, oily rags, etc.
- Contaminated oil;
- Spent Batteries;
- Waste Anti-freeze;
- Used light bulbs/tubes; and
- All hazardous waste packaging.

4.2.4 Again all vessel operators of vessels over 400t and certified to carry 15 persons or more will be required to produce estimates of waste streams during their operations and to identify appropriate handling and disposal options in their waste management plans, for approval by BOWL.

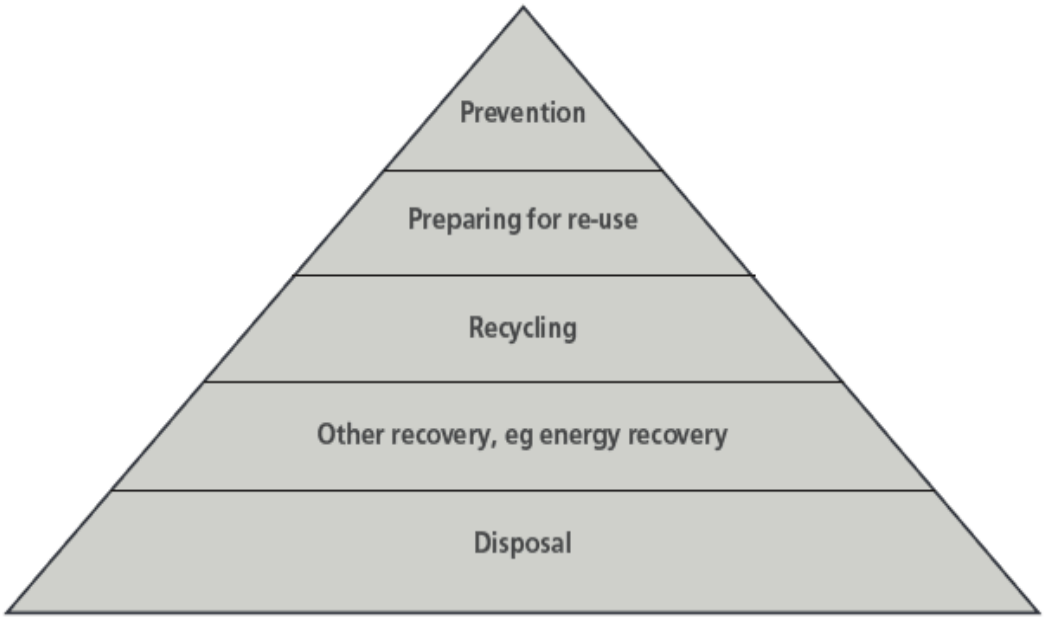
# 5 Waste Management

## 5.1 Waste Hierarchy

5.1.1 Construction and O&M waste generated from the Development will be managed according to the principles of the waste hierarchy (Figure 5.1). The waste hierarchy ranks waste management options according to what is best for the environment, giving priority to waste prevention. When waste has been generated, priority is given to preparing it for re-use, then recycling, then recovery, and last of all disposal (for example, landfill).

5.1.2 The waste hierarchy is a key element of sustainable waste management and is a legal requirement of the revised EU WFD and is central to the Waste (Scotland) Regulations 2012.

**Figure 5.1 - Waste Hierarchy (Source: Scottish Government, 2009).**




**Prevention**

5.1.3 All reasonably practicable measures shall be taken to **minimise** the amount of waste produced in general and of hazardous waste in particular.

5.1.4 Opportunities to reduce packaging or implement take-back schemes for packaging and unused materials will be discussed with the suppliers. Where possible, hazardous materials will be substituted for less hazardous alternatives.

5.1.5 Waste minimisation measures will be set out in waste management plans and implemented by the Key Contractors during construction and operation in order to achieve the waste allowance targets. These measures may include:

- Ordering and using only enough materials required to complete the task;
- Handling and storing materials so as to maximise product life; and
- Ensuring that materials that can be reused are handled to prevent damage.

**Re-Use**

5.1.6 Opportunities to re-use materials will be investigated as the detailed design progresses.

**Recycling**

5.1.7 Wastes generated during the construction process will be segregated into waste types to facilitate off-site recycling (for example, metals, wood, and plastic). Sufficient space will be allocated for storage of separate containers of key waste materials. These containers will be clearly labelled and construction staff will be given training on waste segregation.

5.1.8 The Key Contractors will consider the use of recycled materials where possible, subject to BOWL approval, cost and availability.

**Disposal**

5.1.9 All waste that cannot be reused, recycled or recovered will be collected by the licensed waste management contractor and disposed of at a permitted site suitable for the type of waste. Waste generated from offshore activities will be brought onshore for recycling or disposal. Ground food waste will be disposed of at sea in accordance with the Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008.

### 5.2 Offshore Storage, Segregation and Handling of Wastes

5.2.1

5.2.2 Table 5.1 below sets out specific measures for the storage, segregation and handling of wastes offshore.

**Table 5.1: Measures for storage, segregation and handling of wastes**

| Waste Type | Management measures |
|---|---|
| **Storage** | |
| All | All skips and other similar containers used for storing and transportation of waste shall be adequately protected so as to ensure that the waste does not escape into the environment; and that vermin and pests are not attracted to the waste. |
| | All waste skips shall be suitable for offshore use with some form of containment (e.g. lids, nets) to prevent waste material blowing overboard and subsequent pollution to sea. Lay down areas with suitable storage space will be allocated on the installation and supply vessels for waste bins and containers that provide sufficient working space to allow unobstructed movement for personnel and equipment. |
| | Designated wheelie bins will be filled with absorbent pads and will be provided as spill kits on the installation vessels. In addition, oily waste bins and temporary bunding (for isolating problematic areas or prior to commencing repairs for example on hydraulic equipment) will be provided. Once used, contaminated spill kit materials will be stored in hazardous waste bags, or disposed of into the designated hazardous waste skip, and transported to shore for disposal. All staff should be trained in the use and appropriate disposal of these spill kits. |
| General (non-hazardous) | Where ships do not have a sewage treatment plant or sewage comminuting and disinfecting systems, sewage must be retained in an appropriate holding tank, which has a visual indicator of the amount of its contents. The size of the tank should be based on the ship's intended usage and number of crew. |
| Hazardous | All construction vessels should have adequate facilities in place to store and handle all types of hazardous waste reasonably expected. |
| | All hazardous waste materials will be stored in hazardous waste skips and drums or tote tanks (for liquid wastes) for transport to shore. Ignitable or reactive wastes shall be stored at a distance and separate from heat sources and living quarters with appropriate warning signage. Waste drums and containers should be regularly checked for leakage or corrosion and shall be of such design that water will not collect on tops and resting surfaces. |
| | Permanent liquid chemical and liquid hydrocarbon waste storage areas shall have secondary containment. |
| **Segregation and Treatment** | |
| All | Waste will be segregated into designated skips and waste containers on board the construction vessels. |
| | All non-hazardous and hazardous waste shall be **clearly marked** and shall be accompanied by appropriate **Waste Transfer and Consignment Notes**. |
| General (non-hazardous) | Ship sewage treatment plants or sewage comminuting and disinfecting systems must be approved by survey prior to issue of a ship Sewage Certificate. |
| Recyclable | Recyclable wastes should be placed in designated containers provided on installation and supply vessels. The waste container should be clearly marked "For Recycling" and the contents named.<br>Recyclable hazardous wastes, such as oils and batteries, will be stored separately from non-recyclable materials and appropriately labelled. |

| Waste Type | Management measures |
|---|---|
| | |
| **Handling, Labelling and packaging** | |
| All | All wastes to be sent onshore must be properly labelled with appropriate SDS attached for hazardous wastes. Prior to loading any wastes for shipment to shore, a final check must be made of the requirements for packaging, labelling and documentation. |
| | Labelling should identify clearly the contents, the hazards, and the producer of the waste, and should be linked to the transfer documentation (e.g. Waste Transfer or Consignment Note). The labelling for hazardous waste will be based on the current IMDG (International Maritime Dangerous Goods) classification. Secondary hazard/marine pollutant labels must also be used where applicable. |
| | To ensure containment and to prevent any risk of exposure or contamination, all packaging used must be suitable for the materials involved, be leak proof, and be capable of withstanding the rigors of transportation. All packaging must be of a United Nations (UN) approved type, unless the material has been packaged prior to handling and it is impractical to repackage it. For wastes that are also classified as Dangerous Goods under IMDG, the inner packaging is defined by the hazard and the IMDG Code. |
| | In the case of liquid wastes, care must be taken to adhere to the appropriate fill level to prevent over-pressurisation of waste containers. Drums of waste must not be loaded in open skips/half heights as this causes problems to the waste disposal contractors on removal. |
| | Sacks must only be used for dry wastes, and these must be of the appropriate approved type. Bags pre-marked for hazardous waste must not be used for non-hazardous wastes to avoid mishandling at the disposal locations. |
| General (non-hazardous) | For general non-hazardous solid waste, wood, packaging wastes and general mixed scrap metal, baskets/skips up to the size of "half heights" can be used. Unless used for large single items, full height open-topped containers should not be used for waste/mixed scrap as these may exceed the lift capacity of the waste management contractors' forklifts and cannot be emptied other than by hand. |
| **Disposal** | |
| General (non-hazardous) | Offshore, no solid wastes will be discharged overboard and on board storage will include suitable containers (segregated from hazardous waste materials), labelled as 'General Waste Skips', ahead of being transported back to shore for disposal/recycling. |
| | Non-hazardous, inert solid wastes from construction or O&M activities will be transported to shore and disposed of at a suitable landfall site. |
| | In relation to sewage and garbage, the requirements of MARPOL73/78 Annex IV and MARPOL 73/78 Annex V (as amended) will be complied with:<br>• Annex IV (Prevention of Pollution by Sewage from Ships) prohibits the discharge of sewage into the sea, except when the ship has an approved sewage treatment plant or when the ship is discharging comminuted and disinfected sewage using an approved system at a distance of more than three nautical miles from the nearest land; sewage which is not comminuted or disinfected has to be discharged at a distance of more than 12 nautical miles from the nearest land (IMO, 2015).<br>• Annex V (Prevention of Pollution by Garbage from Ships) specifies the distances from land and the manner in which garbage may be disposed of; imposes a complete ban on the disposal into the sea of all forms of plastics (IMO, 2015). |

### 5.3 Registered Carriers

5.3.1 Waste generated during the construction and operation of the Development will only be transported once onshore by companies approved by BOWL and registered with SEPA and possessing valid waste carrier licences as required in regulation 3, 4, 5 and 6 of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014.

5.3.2 Offshore waste will be stored in appropriate containers and transported once ashore by SEPA licensed waste carriers, as published on the SEPA website:

http://www.sepa.org.uk/waste/waste_regulation/waste_carriers_and_brokers/who_is_registered.aspx

5.3.3 Once ashore, the containers will be transported by a SEPA licensed waste carrier to a licensed waste management facility.

## References

BOWL (2012) Beatrice Offshore Wind Farm, Environmental Statement, Arcus Renewable Energy Consulting Ltd (April 2012).

IMO (2015) International Convention for the Prevention of Pollution from Ships (MARPOL), Available at: http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-%28MARPOL%29.aspx.

Scottish Government (2009) Scotland's Zero Waste Plan, Available at: http://www.gov.scot/Publications/2009/08/19141153/8.

Scottish Government (2010) Scotland's Zero Waste Plan.

Scottish Government (2012) Duty of Care – A Code of Practice.

SEPA (2010) Site Waste – A Simple Guide to Site Waste Management Plans.

## Appendix A – European Waste Catalogue Codes

European Waste catalogue (EWC) codes and waste categories potentially generated offshore from the construction and operation of the Development (extracted from European Waste Framework Directive (WFD) (2008/98/EC)). * Denotes hazardous waste entry.

| |
|---|
| 08 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS |
| 08 01 wastes from MFSU and removal of paint and varnish |
| 08 01 11* waste paint and varnish containing organic solvents or other hazardous substances |
| 08 01 12 waste paint and varnish other than those mentioned in 08 01 11 |
| 08 01 13* sludges from paint or varnish containing organic solvents or other hazardous substances |
| 08 01 14 sludges from paint or varnish other than those mentioned in 08 01 13 |
| 08 01 15* aqueous sludges containing paint or varnish containing organic solvents or other hazardous substances |
| 08 01 16 aqueous sludges containing paint or varnish other than those mentioned in 08 01 15 |
| 08 01 17* wastes from paint or varnish removal containing organic solvents or other hazardous substances |
| 08 01 18 wastes from paint or varnish removal other than those mentioned in 08 01 17 |
| 08 01 19* aqueous suspensions containing paint or varnish containing organic solvents or other hazardous substances |
| 08 01 20 aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19 |
| 08 01 21* waste paint or varnish remover |
| 08 01 99 wastes not otherwise specified |
| 08 02 wastes from MFSU of other coatings (including ceramic materials) |
| 08 02 01 waste coating powders |
| 08 02 02 aqueous sludges containing ceramic materials |
| 08 02 03 aqueous suspensions containing ceramic materials |
| 08 02 99 wastes not otherwise specified |
| 08 03 wastes from MFSU of printing inks |

| |
|---|
| 08 03 19* disperse oil |
| 08 03 99 wastes not otherwise specified |
| 08 04 wastes from MFSU of adhesives and sealants (including waterproofing products) |
| 08 04 09* waste adhesives and sealants containing organic solvents or other hazardous substances |
| 08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09 |
| 08 04 11* adhesive and sealant sludges containing organic solvents or other hazardous substances |
| 08 04 12 adhesive and sealant sludges other than those mentioned in 08 04 11 |
| 08 04 13* aqueous sludges containing adhesives or sealants containing organic solvents or other hazardous substances |
| 08 04 14 aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13 |
| 08 04 15* aqueous liquid waste containing adhesives or sealants containing organic solvents or other hazardous substances |
| 08 04 16 aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15 |
| 08 04 17* rosin oil |
| 08 04 99 wastes not otherwise specified |
| 08 05 wastes not otherwise specified in 08 |
| 08 05 01* waste isocyanates |
| 13 OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05,12 and 19) |
| 13 01 waste hydraulic oils |
| 13 01 01* hydraulic oils, containing PCBs (1) |
| 13 01 04* chlorinated emulsions |
| 13 01 05* non-chlorinated emulsions |
| 13 01 09* mineral-based chlorinated hydraulic oils |
| 13 01 10* mineral based non-chlorinated hydraulic oils |
| 13 01 11* synthetic hydraulic oils |
| 13 01 12* readily biodegradable hydraulic oils |
| 13 01 13* other hydraulic oils |
| 13 02 waste engine, gear and lubricating oils |

| |
|---|
| 13 02 04* mineral-based chlorinated engine, gear and lubricating oils |
| 13 02 05* mineral-based non-chlorinated engine, gear and lubricating oils |
| 13 02 06* synthetic engine, gear and lubricating oils |
| 13 02 07* readily biodegradable engine, gear and lubricating oils |
| 13 02 08* other engine, gear and lubricating oils |
| 13 03 waste insulating and heat transmission oils |
| 13 03 01* insulating or heat transmission oils containing PCBs |
| 13 03 06* mineral-based chlorinated insulating and heat transmission oils other than those mentioned in 13 03 01 |
| 13 03 07* mineral-based non-chlorinated insulating and heat transmission oils |
| 13 03 08* synthetic insulating and heat transmission oils |
| 13 03 09* readily biodegradable insulating and heat transmission oils |
| 13 03 10* other insulating and heat transmission oils |
| 13 04 bilge oils |
| 13 04 01* bilge oils from inland navigation |
| 13 04 02* bilge oils from jetty sewers |
| 13 04 03* bilge oils from other navigation |
| 13 05 oil/water separator contents |
| 13 05 01* solids from grit chambers and oil/water separators |
| 13 05 02* sludges from oil/water separators |
| 13 05 03* interceptor sludges |
| 13 05 06* oil from oil/water separators |
| 13 05 07* oily water from oil/water separators |
| 13 05 08* mixtures of wastes from grit chambers and oil/water separators |
| 13 07 wastes of liquid fuels |
| 13 07 01* fuel oil and diesel |
| 13 07 02* petrol |

| |
|---|
| 13 07 03* other fuels (including mixtures) |
| 13 08 oil wastes not otherwise specified |
| 13 08 01* desalter sludges or emulsions |
| 13 08 02* other emulsions |
| 13 08 99* wastes not otherwise specified |
| 14 WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (except 07 and 08) |
| 14 06 waste organic solvents, refrigerants and foam/aerosol propellants |
| 14 06 01* chlorofluorocarbons, HCFC, HFC |
| 14 06 02* other halogenated solvents and solvent mixtures |
| 14 06 03* other solvents and solvent mixtures |
| 14 06 04* sludges or solid wastes containing halogenated solvents |
| 14 06 05* sludges or solid wastes containing other solvents |
| 15 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED |
| 15 01 packaging (including separately collected municipal packaging waste) |
| 15 01 01 paper and cardboard packaging |
| 15 01 02 plastic packaging |
| 15 01 03 wooden packaging |
| 15 01 04 metallic packaging |
| 15 01 05 composite packaging |
| 15 01 06 mixed packaging |
| 15 01 07 glass packaging |
| 15 01 09 textile packaging |
| 15 01 10* packaging containing residues of or contaminated by dangerous substances |
| 15 01 11* metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers |
| 15 02 absorbents, filter materials, wiping cloths and protective clothing |
| 15 02 02* absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances |

| |
|---|
| 15 02 03 absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02 |
| 17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES) |
| 17 01 concrete, bricks, tiles and ceramics |
| 17 01 01 concrete |
| 17 01 02 bricks |
| 17 01 03 tiles and ceramics |
| 17 01 06* mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances |
| 17 01 07 mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06 |
| 17 02 wood, glass and plastic |
| 17 02 01 wood |
| 17 02 02 glass |
| 17 02 03 plastic |
| 17 02 04* glass, plastic and wood containing or contaminated with hazardous substances |
| 17 03 bituminous mixtures, coal tar and tarred products |
| 17 03 01* bituminous mixtures containing coal tar |
| 17 03 02 bituminous mixtures other than those mentioned in 17 03 01 |
| 17 03 03* coal tar and tarred products |
| 17 04 metals (including their alloys) |
| 17 04 01 copper, bronze, brass |
| 17 04 02 aluminium |
| 17 04 03 lead |
| 17 04 04 zinc |
| 17 04 05 iron and steel |
| 17 04 06 tin |
| 17 04 07 mixed metals |
| 17 04 09* metal waste contaminated with hazardous substances |

| |
|---|
| 17 04 10* cables containing oil, coal tar and other hazardous substances |
| 17 04 11 cables other than those mentioned in 17 04 10 |
| 17 05 soil (including excavated soil from contaminated sites), stones and dredging spoil |
| 17 05 03* soil and stones containing hazardous substances |
| 17 05 04 soil and stones other than those mentioned in 17 05 03 |
| 17 05 05* dredging spoil containing hazardous substances |
| 17 05 06 dredging spoil other than those mentioned in 17 05 05 |
| 17 05 07* track ballast containing hazardous substances |
| 17 05 08 track ballast other than those mentioned in 17 05 07 |
| 17 06 insulation materials and asbestos-containing construction materials |
| 17 06 01* insulation materials containing asbestos |
| 17 06 03* other insulation materials consisting of or containing hazardous substances |
| 17 06 04 insulation materials other than those mentioned in 17 06 01 and 17 06 03 |
| 17 06 05* construction materials containing asbestos (7) |
| 17 08 gypsum-based construction material |
| 17 08 01* gypsum-based construction materials contaminated with hazardous substances |
| 17 08 02 gypsum-based construction materials other than those mentioned in 17 08 01 |
| 17 09 other construction and demolition wastes |
| 17 09 01* construction and demolition wastes containing mercury |
| 17 09 02* construction and demolition wastes containing PCB (for example PCB containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors) |
| 17 09 03* other construction and demolition wastes (including mixed wastes) containing hazardous substances |
| 17 09 04 mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03 |

## Appendix B – Criteria for classification as a Hazardous Waste

### ANNEX III – PROPERTIES OF WASTES WHICH RENDER IT HAZARDOUS[1]

| | |
|---|---|
| H1 “Explosive” | Waste which is capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic waste, explosive organic peroxide waste and explosive self-reactive waste is included. |
| H2 “Oxidising” | Waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials. |
| H3 “Flammable” | • Flammable liquid waste: liquid waste having a flash point below 60 °C or waste gas oil, diesel and light heating oils having a flash point > 55 °C and ≤ 75 °C;<br>• Flammable pyrophoric liquid and solid waste: solid or liquid waste which, even in small quantities, is liable to ignite within five minutes after coming into contact with air;<br>• Flammable solid waste: solid waste which is readily combustible or may cause or contribute to fire through friction;<br>• Flammable gaseous waste: gaseous waste which is flammable in air at 20 °C and a standard pressure of 101.3 kPa;<br>• Water reactive waste: waste which, in contact with water, emits flammable gases in dangerous quantities;<br>• Other flammable waste: flammable aerosols, flammable self-heating waste, flammable organic peroxides and flammable self-reactive waste. |
| H4 “Irritant – skin irritation and eye damage” | Waste which on application can cause skin irritation or damage to the eye. |
| H5 “Specific Target Organ Toxicity (STOT)/Aspiration Toxicity” | Waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration |
| H6 “Acute Toxicity” | Waste which can cause acute toxic effects following oral or dermal administration, or inhalation exposure. |
| H7 “Carcinogenic” | Waste which induces cancer or increases its incidence. |
| H8 “Corrosive” | Waste which on application can cause skin corrosion. |

[1] COMMISSION REGULATION (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

| | |
|---|---|
| H9 “Infectious” | Waste containing viable micro-organisms or their toxins that are known or reliably believed to cause disease in man or other living organisms. |
| H10 “Toxic for reproduction” | Waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring. |
| H11 “Mutagenic” | Waste which may cause a mutation that is a permanent change in the amount or structure of the genetic material in a cell. |
| H12 “Release of an acute toxic gas” | Waste which releases acute toxic gases (Acute Tox. 1, 2 or 3) in contact with water or an acid. |
| H13 “Sensitizing” | Waste which contains one or more substances known to cause sensitising effects to the skin or the respiratory organs. |
| H14 “Ecotoxic” | Waste which presents or may present immediate or delayed risks for one or more sectors of the environment. |
| H15 | “Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste”. |

## Appendix C – Example Key Waste Forecast (for offshore turbine installation)

| Construction / Operation | Description | Material | Type of Waste | EWC Code | Estimated Quantity Construction | Estimated Quantity Operation | Target for Reuse/Recycle percentage | Source of Data |
|---|---|---|---|---|---|---|---|---|
| Construction | General waste | Mixed | Household | | 25,200 Kg | | Onshore disposal | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Mixed Cable | Aluminium Cable | Cable Cuts | | 4032 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Aluminium | Aluminium | Plates, bolts and Other | | 6384 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Stainless Steel | Stainless Steel | Wires and Others | | 3192 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Soft PVC - Tarpaulin | Tarpaulins | Tarpaulins – made from soft PVC | | 15288 kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Metal | Metal | Bolts, washers and other metals | | 50,064 kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |

| Construction / Operation | Description | Material | Type of Waste | EWC Code | Estimated Quantity Construction | Estimated Quantity Operation | Target for Reuse/Recycle percentage | Source of Data |
|---|---|---|---|---|---|---|---|---|
| Construction | Cardboard / Paper | Cardboard / Paper | Packaging | | 2520 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Mixed plastic folio | Wrapping Folio (Transparent) | Wrapping Folio | | 3696 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Wood | Wood | Pallets and frame | | 54,684 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Small Batteries | Small Batteries | Hand tool, AA, AAA and other | | 29 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Used Spray Cans (UN 1950) | Empty Spray Cans <1 litre (UN 1950) | Neverseez, Cleaning and Other | | 29 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Used Liquid Coolant | Liquid Coolant | Top Up left Overs | | 114 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |

| Construction / Operation | Description | Material | Type of Waste | EWC Code | Estimated Quantity Construction | Estimated Quantity Operation | Target for Reuse/Recycle percentage | Source of Data |
|---|---|---|---|---|---|---|---|---|
| Construction | Used liquid Oil | Waste Oil | Oil from Pumpstation, Refill | | 1058 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Paint Materials (UN 1263) | Paint Residues (UN 1263) | Sikaflex, Paint Repairs, Loctite | | 36 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Dry Paint Materials | Paint Contaminated Plastic | Paint contaminated plastic, cardboard and other solids | | 151 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Solid Oil Materials | Oil / Fat Containing Cloths / Rags | Tubes, Cloths | | 260 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Construction | Used Oil Filters | Oil Filters | Service of Oil Filters | | 106 Kg | | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | General Waste | Household | Household | | | 10,920 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |

| Construction / Operation | Description | Material | Type of Waste | EWC Code | Estimated Quantity Construction | Estimated Quantity Operation | Target for Reuse/Recycle percentage | Source of Data |
|---|---|---|---|---|---|---|---|---|
| Commissioning | Cardboard / Paper | Cardboard / Paper | Cardboard / Paper from Packaging & Office | | | 2940 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Mixed Plastic Folio | Wrapping Folio (Transparent) | Wrapping Folio from pallets | | | 193 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Metal | Metal | Bolts, washers and other metals | | | 353 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Stainless Steel | Stainless Steel | Bolts, washers and other stainless steel materials | | | 735 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Copper Cable | Copper Cable | Cable Cuts without plugs | | | 336 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Aluminium Cable | Aluminium Cable | Cable Cuts with Plugs | | | 1092 Kg | Recycling | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |

| Construction / Operation | Description | Material | Type of Waste | EWC Code | Estimated Quantity Construction | Estimated Quantity Operation | Target for Reuse/Recycle percentage | Source of Data |
|---|---|---|---|---|---|---|---|---|
| Commissioning | Paint Materials | Paint Residues (Un 1263) | Chemical Solids, Paint Etc | | | 403 Kg | Recycle | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |
| Commissioning | Used Liquid Oil | Waste Oil | Waste Oil & Black Water | | | 1260 Kg | Recycle | SWP Site Waste Calculation Spreadsheet – Ref: INS 14541 |

## Annex 7 - Dropped Object Procedure Notification Pro-Forma

# Proposed Marine Licence Dropped Object Incident Report - Notification Pro-forma

### Notification pro-forma for reporting the loss or dumping of materials at sea

**Forward to, within 6 hours of loss or dumping incident:**

| | |
|---|---|
| **Marine Scotland** | **MS.MarineLicensing@scotland.gsi.gov.uk** |
| Scottish Fishermen's Federation | PON2@sff.co.uk or fax – 01224 647078 |
| National Federation of Fishermen's Organisations | nffo@nffo.org.uk or fax 01904 635431 |
| Maritime & Coastguard Agency | aberdeen.coastguard@mcga.gov.uk or fax 01224 575920 |
| Kingfisher at Seafish | kingfisher@seafish.co.uk or fax 01472 268792 |

| **Identity of Reporter** | |
|---|---|
| **Full Name**: | Date of Report: |
| Company: | **Position/Title:** |
| **Contact Telephone No**: | **Contact E-Mail:** |
| **Operator/Organisation/Company Responsible for Incident:** | |
| **Name of Installation or Vessel responsible for the loss or dumping of the material** | |
| **Location/position of the installation/vessel at the time of the loss or dumping:** | |
| **Latitude (WGS84 DDD MM.MMM):** | **Longitude (WGS84 DDD MM.MMM):** |
| **Date of Loss:** | **Time (24hours):** |
| **Weather conditions at time of loss/dumping:** | **Depth of Water (m):** |
| **Wind Direction (0-360 degree):** | **Wind Speed (knots):** |
| **Beaufort Scale:** | **Wave Height (metres):** |
| **Tide Rate:** | **Tide Direction:** |
| **Number of hours before/after High Water item was lost:** | |

| | |
|---|---|
| **Materials lost or dumped – provide as full a description as possible –i.e. clearly highlight if synthetic materials involved, are there wires involved, dimensions of materials etc. – If photo's available please attach separately. Specify the purpose of the function of the materials** | |
| **Dimensions of the object:** | |
| **Estimated clearance over object (including calculation methodology):** | |
| **If the materials are resting on the seabed are they lying wholly within a Safety Zone? Yes or No:** | |
| **Are the materials likely to float on sea surface or in water column? Yes or No** | |
| **If the answer to question above is YES - are materials likely to reach shore or cross a median line? - please specify** | |
| **Reasons the loss or dumping (if Force Majeure is invoked please clearly state this):-** | |
| **Are there plans to recover the materials? – if yes, specify details including anticipated timescales for the recovery operation. If there are no plans to recover the materials the reason for this must be clearly specified. Please detail if any further consent is required to undertake remediation action.** | |
| **Please provide details of any interim mitigation measures put in place to deal with immediate risks to navigation:** | |
| **Details of any radio Navigational Warnings and/or Notices to Mariner's:** | |
| **What are considered to be the risks and dangers to other users of the sea as a result of the lost or dumped materials not being recovered?** | |
| **Any further information that may be useful:** | |

## Annex 8 - BOWL Marine Pollution Scenarios and Prevention Measures

| Potential Pollutant | Spill scenario | Prevention measures |
|---|---|---|
| **Hydrocarbons**<br>Intermediate Fuel Oil (IFO)<br>Marine Gas Oil (MGO) (Diesel) | **Vessel refuelling**<br>Loss of fuel during vessel to vessel refuelling at sea* or refuelling at port.<br>*See **MPCP Part 2 Section 8.3.1**. | Preparation and review of task-specific risk assessments, method statements and fuel transfer planning tools and checklists.<br>Refuelling of vessels or equipment offshore shall, where practicable, only commence during daylight and in good weather conditions.<br>Refuelling operations will be planned in advance. |
| | **Equipment refuelling**<br>Loss of fuel during refuelling of equipment (on vessel or on turbine/offshore transformer module (OTM)). | Fuel transfer operations will be carefully conducted under the supervision by an appointed responsible person on board (e.g., Chief Engineer) and in accordance with each vessel's stipulated procedure and checklist.<br>A bunker plan shall be developed and posted on the Bridge and in the Machinery Control Room.<br>Before fuel transfer starts a meeting will be held with all ship staff involved in the operation and the following subjects should be discussed, as a minimum:<br>▪ Bunker plan, including any anticipating changes;<br>▪ Risk assessment;<br>▪ Individual roles and responsibilities in the process;<br>▪ Emergency situations; and<br>▪ Bunkering Checklists.<br>Only hoses fitted with non-return valves shall be used for the offshore transfer of fuel or other fluids.<br>Vessels over 400 GRT will carry a Shipboard Oil Pollution Emergency Plan (SOPEP) in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996.<br>Vessels over 400 GRT will carry an Oil Record Book in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. In the Oil Record Book particulars are entered of:<br>▪ Details of fuel and oil bunker operations;<br>▪ Disposal of sludge (oil residues);<br>▪ Discharge overboard or disposal otherwise of machinery space bilge water;<br>▪ Condition of oil discharge monitoring and control systems;<br>▪ Accidental or other exceptional discharges of oil; and<br>▪ Additional operational procedures and general remarks.<br>Appropriate training of personnel and supervision of activity.<br>Compliance with conditions related to vessel refuelling set out in Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" (see **MPCP Part 2 Section 8.3.1**).<br>A visual lookout will be made at all times during fuel transfer operations to verify hose integrity throughout the transfer and in |

| Potential Pollutant | Spill scenario | Prevention measures |
|---|---|---|
| | | order to spot any leaks immediately.<br>All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume.<br>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.<br>Spill kits shall be readily available for mopping up any minor spills.<br>Regular inspection and maintenance of equipment.<br>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned.<br>Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified. |
| | **Vessel to vessel collision**<br>Loss of fuel from collision between two vessels. | All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-XXX) to prevent vessel to vessel collision and vessel to structure allision. |
| | **Vessel to structure allision**<br>Loss of fuel from allision between vessel and structure (e.g., wind turbine). | |
| | **Vessel stranding/grounding**<br>Loss of fuel due to vessel stranding/grounding. | All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-XXX) to prevent vessel stranding / grounding. |
| | **Failure of plant or equipment**<br>Release of fuel due to failure of plant or equipment. | All equipment shall be operated and maintained in good order and in accordance with legal requirements.<br>All plant and equipment shall only be operated by adequately trained and competent personnel.<br>All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume.<br>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned.<br>Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified. |
| | **Spillage during use of equipment**<br>Small spills during operation. | Preparation and review of task-specific risk assessments and method statements.<br>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.<br>Spill kits shall be readily available for mopping up any minor spills.<br>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned.<br>Oil pressure pipes and fuel oil pipes and fittings will be inspected |

| Potential Pollutant | Spill scenario | Prevention measures |
|---|---|---|
| | | regularly to ensure that leaks are detected at an early stage and rectified. |
| **Lubricating Oil** | **Incident**<br>Loss of lubricating oil from collision between two vessels, or allision between vessel and structure, or stranding/grounding of vessel. | All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-XXX) to prevent vessel to vessel collision, vessel to structure allision and vessel stranding / grounding. |
| | **Leakage within wind turbine**<br>Leakage of turbine gearboxes. | All equipment shall be operated and maintained in good order and in accordance with legal requirements.<br>Turbine gearbox oil seals shall be routinely checked during planned maintenance programmes. |
| | **Leakage within OTMs**<br>Leakage of transformers. | All equipment shall be operated and maintained in good order and in accordance with legal requirements.<br>Transformer oil seals shall be routinely checked during planned maintenance programmes. |
| **Hydraulic Oil** | **Incident**<br>Loss of hydraulic oil from collision between two vessels, or collision between vessel and structure, or stranding/grounding of vessel. | All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-XXX) to prevent vessel to vessel collision, vessel to structure allision and vessel stranding / grounding. |
| | **Failure of plant or equipment**<br>Release of hydraulic oil due to failure of plant or equipment, e.g., hydraulic hoses. | All equipment shall be operated and maintained in good order and in accordance with legal requirements.<br>All plant and equipment shall only be operated by adequately trained and competent personnel.<br>All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume. |
| | **Spillage during use of equipment**<br>Small spills during operation. | Preparation and review of task-specific risk assessments and method statements.<br>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.<br>Spill kits shall be readily available for mopping up any minor spills. |
| **Chemicals** | **Incident**<br>Loss of chemical load from vessel collision/allision, or stranding/grounding of vessel. | All vessels will comply with the measures set out in the Navigational Safety Plan (NSP) (LF000005-PLN-XXX) to prevent vessel to vessel collision, vessel to structure allision and vessel stranding / grounding. |
| | **Spillage during use**<br>Spillage of paints, paint thinners, solvents, cleaning fluids etc during use. | Preparation and review of task-specific risk assessments and method statements.<br>Personnel shall be trained in the correct handling and use of chemicals. |

| Potential Pollutant | Spill scenario | Prevention measures |
|---|---|---|
| | | Personnel shall be trained in spill prevention awareness, and in the use of spill kits.<br>Spill kits shall be readily available for mopping up any minor spills.<br>All hazardous substances shall have a safety data sheet (SDS) which is intended to provide procedures for handling or working with that substance in a safe manner. The handling and use of chemicals and hazardous substances shall be in compliance with the information on the SDS.<br>COSHH assessments shall be conducted for Project specific hazardous substances.<br>Segregated storage facilities will be used to control the separation of hazardous substances. |

## References

DECC (2014) Oil and gas: petroleum operations notices. Available at: https://www.gov.uk/oil-and-gas-petroleum-operations-notices#pon-2 [Accessed 20/05/2015].

Institute of Environmental Management and Assessment (IEMA) (2008) Environmental Management Plans, Best Practice Series, Volume 12, December 2008.

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