Beatrice Transmission Works: Environmental Scoping Report

May 2011
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Appropriate Assessment</strong></td>
<td>An assessment required by law for proposals that would likely have an effect on a European Site.</td>
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<tr>
<td><strong>AIS</strong></td>
<td>Automatic Identification System.</td>
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<tr>
<td><strong>BERR</strong></td>
<td>The Department for Business, Enterprise and Regulatory Reform.</td>
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<tr>
<td><strong>BML</strong></td>
<td>Below mudline.</td>
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<tr>
<td><strong>BOWL</strong></td>
<td>Beatrice Offshore Windfarm Limited.</td>
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<tr>
<td><strong>CA</strong></td>
<td>Countryside Association.</td>
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<tr>
<td><strong>CAA</strong></td>
<td>Civil Aviation Authority.</td>
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<tr>
<td><strong>CEFAS</strong></td>
<td>Centre for Environment, Fisheries &amp; Aquaculture Science.</td>
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<tr>
<td><strong>CNSRP</strong></td>
<td>The Caithness and North Sutherland Regeneration Partnership.</td>
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<td><strong>COWRIE</strong></td>
<td>Collaborative Offshore Wind Research into the Environment.</td>
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<td><strong>CPA</strong></td>
<td>Coast Protection Act.</td>
</tr>
<tr>
<td><strong>C-POD</strong></td>
<td>Chelonia pod. A digital marine mammal monitoring device.</td>
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<tr>
<td><strong>Cretaceous</strong></td>
<td>When referencing geology this is the period of time between about 144 to 65 million years ago.</td>
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<tr>
<td><strong>CRRC</strong></td>
<td>Cetacean Research and Rescue Centre.</td>
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<tr>
<td><strong>DECC</strong></td>
<td>Department of Energy and Climate Change.</td>
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<td><strong>DEFRA</strong></td>
<td>Department for Environment, Food and Rural Affairs.</td>
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<tr>
<td><strong>DfT</strong></td>
<td>Department for Transport.</td>
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<tr>
<td><strong>DHI MIKE21</strong></td>
<td>Engineering software package to simulate water conditions.</td>
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<td><strong>DTI</strong></td>
<td>Department for Trade and Industry.</td>
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<tr>
<td><strong>EC</strong></td>
<td>European Commission.</td>
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<tr>
<td><strong>EIA</strong></td>
<td>Environmental Impact Assessment.</td>
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<td><strong>ES</strong></td>
<td>Environmental Statement.</td>
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<td><strong>ESAS</strong></td>
<td>European Seabirds at Sea.</td>
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<td><strong>FEPA</strong></td>
<td>Food and Environment Protection Act.</td>
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<tr>
<td><strong>FLOWW</strong></td>
<td>Fishing Liaison with Offshore Wind and Wet Renewables Group.</td>
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<tr>
<td><strong>GPS</strong></td>
<td>Global Positioning System.</td>
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<tr>
<td><strong>HVDC</strong></td>
<td>High Voltage Direct Current.</td>
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<tr>
<td><strong>ICES</strong></td>
<td>International Council for the Exploration of the Sea.</td>
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<td><strong>JNAPC</strong></td>
<td>Joint Nautical Archaeological Policy Committee.</td>
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<td><strong>JNCC</strong></td>
<td>Joint Nature Conservation Committee.</td>
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<td><strong>LSVIA</strong></td>
<td>Landscape, Seascape and Visual Impact Assessment.</td>
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<td><strong>MCA</strong></td>
<td>Maritime Coastguard Agency.</td>
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<td><strong>MFA</strong></td>
<td>Marine and Fisheries Agency.</td>
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<td><strong>MHWS</strong></td>
<td>Mean High Water Springs.</td>
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<td><strong>MoD</strong></td>
<td>Ministry of Defence.</td>
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<td><strong>MORL</strong></td>
<td>Moray Offshore Renewables Limited.</td>
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<tr>
<td><strong>MSL</strong></td>
<td>Mean sea level.</td>
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<td><strong>MW</strong></td>
<td>Megawatt.</td>
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<tr>
<td><strong>NATS</strong></td>
<td>National Air Traffic Services.</td>
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<tr>
<td><strong>NETSO</strong></td>
<td>National Electricity Transmission System Operator.</td>
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<td><strong>NFFO</strong></td>
<td>National Federation of Fisherman’s Organisation.</td>
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<tr>
<td><strong>AWAC</strong></td>
<td>Acoustic Wave and Current profiler, an ocean observing system.</td>
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<td><strong>OFTO</strong></td>
<td>Offshore Transmission Owners.</td>
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<td><strong>Ofgem</strong></td>
<td>Office of the Gas and Electricity Markets.</td>
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<tr>
<td><strong>OREIs</strong></td>
<td>Offshore Renewable Energy Installations.</td>
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<tr>
<td><strong>PEXA</strong></td>
<td>Practice and Exercise Areas.</td>
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<tr>
<td><strong>Quaternary</strong></td>
<td>When referencing geology this is the period of time between the present and 1.6 million years ago.</td>
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<tr>
<td><strong>Round 3</strong></td>
<td>Crown Estate identified offshore wind farm zones.</td>
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<td><strong>RSPB</strong></td>
<td>Royal Society for the Protection of Birds.</td>
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Glossary

Scouring  A process by which surface material is removed through abrasive action.
SAC  Special Area of Conservation.
SEA  Strategic Environmental Assessment.
Seascape  The coastal landscape character including the coast and the sea.
SERL  SeaEnergy Renewables Limited.
SFF  Scottish Fishermen's Federation.
SMRU  Sea Mammal Research Unit.
SNH  Scottish Natural Heritage.
Soft Starts  A construction technique employed to allow wildlife dispersal prior to commencement of intrusive works.
SPA  Special Protection Area.
SSE  Scottish and Southern Energy.
SSER  Scottish and Southern Energy Renewables.
STW  Scottish territorial waters.
Transmission  Offshore and onshore cable and substation
Works
WDCS  Whale and Dolphin Conservation Society.
ZTV  Zone of Theoretical Visibility.
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7.2.1 Stakeholder Engagement Plan

7.2.2 Get in Touch
1 INTRODUCTION

1.1 THE DEVELOPMENT CONSORTIA

In February 2009 the partnership of SSE Renewables (75 %) and SeaEnergy Renewables (25 %), was awarded exclusivity by The Crown Estate to develop the Beatrice Offshore Wind Farm in Scottish Territorial Waters\(^\text{(1)}\), off the Caithness coastline. This Joint Venture partnership is ‘Beatrice Offshore Wind Farm Limited (BOWL)’.

SSE Renewables (formerly known as Airtricity) is responsible for the development and construction of SSE’s (Scottish and Southern Energy) renewable energy projects across the UK, Ireland and Continental Europe. SSE is the UK’s leading generator of renewable energy with over 2,200 Megawatt (MW) of renewable electricity generation capacity and is the second largest generator in the UK with a total electricity generation capacity of 11,500 MW. SSE has over 1,900 MW of offshore wind farm capacity with consent for development in northern Europe, including the Dutch sector of the North Sea. SSE is ranked 31\textsuperscript{st} in the FTSE 100 index.

SeaEnergy Renewables Limited (SERL) is a subsidiary of SeaEnergy Plc and comprises of members of the team which conceived, developed and delivered the world’s first deep water wind farm development - the Beatrice demonstrator project (10 MW) which is owned by Talisman Energy and SSE. SERL is a subsidiary of SeaEnergy Plc, the only listed company in the UK that is purely offshore wind focused.

1.2 BACKGROUND TO THE PROJECT

The UK Government has set a target of generating 15 % of energy from renewable sources by 2015, with a desired aim of 20 % of energy from renewables by 2020. In a similar move the Scottish Government has set a more ambitious target of Scotland generating 80 % of its energy needs from renewable sources by 2020.

It is recognised that there are significant opportunities to develop Scotland’s capacity to generate electricity from offshore wind technologies. In response there have been numerous studies undertaken and moves made to realise this potential.

In May 2008, The Crown Estate requested initial expressions of interest from companies wishing to be considered for developing commercial scale wind farms within Scottish territorial waters. Following the tender and selection process, exclusive development agreements were granted to various companies and

\(^\text{(1)}\) 12 nautical miles
consortia in February 2009 to develop ten sites with a potential total installed capacity of over 6GW. One of these was for the Beatrice Offshore Wind Farm.

An Environmental Scoping Report (1) was produced for the Beatrice Offshore Wind Farm in March 2010. At that time the development approach to the Transmission Works i.e. the infrastructure required to connect the wind farm to the National Grid, was unclear. The Transmission Works infrastructure includes the offshore cable, onshore cable and substation and it is for this that this Scoping exercise is being undertaken.

1.3 CONSULTATION AND COMMUNICATION

BOWL proposes to undertake its consultation and communication exercises in accordance with reference to best practice(2). Section 7 of this report discusses the proposed approach to communication and consultation throughout the project. A list of organisations and bodies who are being consulted on this Scoping Report is also presented in Section 7.

1.4 OBJECTIVE OF THE SCOPING REPORT

This Scoping Report sets out the findings of the preliminary investigations into the potential environmental impacts and opportunities arising from the construction and operation of the Beatrice Transmission Works.

The development proposals and application will relate to the key Transmission Works components listed below:

- Offshore cable;
- Onshore cable; and
- Onshore electrical substation.

Although the undertaking of a scoping study is not a requirement of the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008, it is generally recognised as good EIA practice.

The main objective of the scoping process is to identify environmental issues which might arise during the construction and operation of the project and which should therefore be addressed in more detail as part of the EIA. An additional aim is to set out the proposed methodologies for undertaking the EIA, so that these

(1) Beatrice Offshore Windfarm Limited Environmental Scoping Report, March 2010
can be agreed by the relevant consultees at an early stage in the process. The Scoping Report will form a basis of common reference for consultation about the scope and methodology for the EIA. A list of those bodies and organisations to be consulted about the EIA is set out in Section 7.

More detailed method statements for some key elements of data gathering and analysis will be developed and agreed with Scottish Government and key agencies, including Marine Scotland and Scottish Natural Heritage (SNH).

The output of the Scoping Report will feed into and inform the ongoing scheme design. The intention is that this interaction will assist in the development of an environmentally optimal design for the project and avoid the unnecessary contemplation of potential impacts and additional costs associated with incorporating mitigation measures later in the design process.

An aim of this Scoping Report is to seek a formal Scoping Opinion from the Scottish Government stating their opinion on the information to be provided in the supporting Environmental Statement (ES)(1). This Opinion should be based on, and in response to, the content of this Report.

The findings of this EIA (Transmission Works) will be published, along with the findings of the Beatrice Offshore Wind Farm EIA, most likely in one ES which will accompany the submission of an Electricity Act (1989) Section 36 application to Marine Scotland for consent to build the Wind Farm and associated Transmission Works.

1.5 CONSENTING FRAMEWORK

1.5.1 Transmission Works

Under the Offshore Transmission Owners (OFTO) arrangements the sub-sea grid connection cable and grid transmission equipment cannot be owned by the wind farm developer. This Scoping Report only considers the transmission works associated with the wind farm. Following construction, a separate company would be responsible for the operation of the transmission works (both offshore and onshore elements, i.e. cables and sub station).

1.5.2 Required Consents

The application for the Beatrice Transmission Works will be submitted towards the end of 2011 (along with the Beatrice Offshore Wind Farm application).

(1) Regulation 7 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000
Introduction

There are a number of possible consenting options for the proposed development (the Transmission Works):

- Section 36 of the Electricity Act 1989; or
- A combination of Section 36 of the Electricity Act 1989 (for the offshore elements) and the Town and Country Planning (Scotland) Act 1997, as amended (for the onshore elements).

At this stage there is no definitive decision regarding the preferred consenting route. It is most likely that an application, which includes the wind farm and transmission systems, will be made to Marine Scotland seeking consent through the framework detailed in the Electricity Act, 1989.

EIA Directive and Regulations

The European Commission EIA Directive (85/337/EEC as amended by 97/11/EC) requires that an Environmental Impact Assessment (EIA) must be carried out in support of an application for development consent for certain types of major projects.

The EIA Directive lists a series of such projects in Annex I and Annex II which are likely to have the potential to give rise to significant environmental effects. Offshore wind farm developments are listed as an Annex II project as ‘installations for the harnessing of wind power for energy production (wind farms)’. Annex II projects will require an EIA where they are likely to have significant effects on the environment by virtue of factors including their nature, size or location. The EIA Directive has been applied to Scottish offshore wind developments through the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Marine Works (Environmental Impact Assessment) Regulations 2007, and onshore works under the Environmental Impact Assessment (Scotland) Regulations 1999 (as amended).

Habitats and Birds Directives and Regulations


In the UK both the Habitats Directive and the Birds Directive have been transposed into national law by means of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), known as the ‘Habitats Regulations’. Under these Habitat Regulations a network of protected sites for birds (Special Protection Areas (SPAs)) and certain habitats and species (Special Areas of Conservation (SACs)) have been
established. Development plans or projects which may affect these European protected sites are subject to particular consideration of their impact on the protected sites and their wildlife.
Introduction
2 PROPOSED DEVELOPMENT DESCRIPTION

2.1 INTRODUCTION

To connect the electricity generated by Beatrice Offshore Wind Farm into the existing National Grid infrastructure a grid connection cable will run from the wind farm site and join the grid at the identified National Grid Connection point. A Scoping Report has been produced for the Wind Farm - Beatrice Offshore Wind Farm, Environmental Scoping Report, March 2010. As this report is focussed on the Transmission Works, this section identifies the cable route study area (both offshore and onshore), National Grid Connection point and how the cable may be constructed.

2.2 SITE SELECTION AND ALTERNATIVES

A site selection process was undertaken to establish the optimum route for the cable from the wind farm site to potential onshore grid connection sites. The grid connection offer made by National Grid to BOWL is at Blackhillock, near Keith in Morayshire. This was based on available capacity and connectivity into the wider National Grid.

To establish if there were better cable routes and grid connection points, the BOWL team undertook a review of potential alternative routes and grid connections to provide a justification for the selected route. This process involved examining a range of alternatives and assessing these on a series of engineering, land ownership and cost criteria.

Six National Grid connection points were considered that were in reasonable close proximity to the wind farm site. These were:

- Connection to Blackhillock substation;
- Connection to Peterhead substation;
- Connection to Rothienorman substation;
- Connection to Dunbeath substation;
- Connection to Mybster substation; and
- Construction of a new substation.

These alternatives were discussed by the project team in a series of workshops and there has been significant analysis for alternative routes, and options undertaken to date, and this work will continue through the EIA process in siting the preferred cable alignment. The key to this work is the length of the cable route and National Grid connection capacity. The preferred study area is shown on Figure 2.1.
This map contains TCarta Bathymetry 2009. © British Crown and SeaZone Solutions Limited. All rights reserved.
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2.3 PROJECT DESCRIPTION

The wind farm requires an export cable to leave the Beatrice Offshore Wind Farm site and connect to the National Grid. As identified within Section 2.2, the National Grid connection point for the Beatrice Offshore Wind Farm is Blackhillock, near Keith where capacity has been identified. To enable this connection the project requires approximately 65 km of subsea cable to the landfall point and then approximately 24 km of probable underground cable to Blackhillock near Keith. A substation will be required at some point along the onshore route.

The key components required for the operational Transmission Works are listed below and each element is discussed thereafter:

- Offshore cable;
- Onshore cable; and
- Substation.

Dependent on the final power output of the wind farm there are two potential options for the cable to be used dependent on whether the power from the wind farm is transferred as Alternating Current (AC) or Direct Current (DC). DC will be favoured for higher power outputs (likely >600MW).

Offshore Cable

AC
If the electrical power is transferred as AC then:
- Beatrice will require potentially three circuits (with three cables per circuit) which will amount to nine cables between three trenches.
- The offshore corridor width is dependent on water depth but in areas of 50 m of water would be approximately 500 m for the 3 cables. In 100 m of water this distance would be more like 1 km, this does not include any exclusion zone either side of the corridor.

DC
If the electrical power is transferred as DC then:
- It is expected that up to four cables would be required, which will constitute two circuits in two separate trenches, two cables laid in the same trench.
- The offshore corridor width will again be dependent on water depth but as there are less cables for the DC option this would be less than the corridor required for the AC option. In 50 m of water the corridor width would typically be 250 m, and in 100 m of water 500 m, not including any exclusion zone either side of the cable corridor.
Onshore Cable

AC
- The overall onshore wayleave for AC cables is approximately 35 m to a depth of approximately 1.5 m, which includes for vehicular access, installation and the three cable trenches.

DC
- The overall onshore wayleave area required is approximately 10 m, to a depth of 1.5 m. The 10 m area includes for vehicular access, installation and the trenches.

Substation

A substation will be built in addition to the current substation at Blackhillock. The substation will either be a transformer station (to transform the current to the voltage required by the National Grid) or a convertor station (to convert the DC to AC before connecting to the National Grid). It is anticipated that the substation is located in close proximity to the existing Blackhillock substation. Detailed design of the substation is yet to be undertaken.

If AC:
- The onshore substation will be approximately 195 m (wide) by 105 m (long) and 25 m (high). There is likely to be an additional area of land required to create a screening bank and landscaping around the substation which could be up to 8000 m².

If DC:
- The onshore substation will be approximately 200 m (wide) by 210 m (long) and 25 m (high). There is likely to be an additional area of land required to create a screening bank and landscaping around the substation which could be up to 16,800 m².

At this stage, the preferred construction techniques has not been identified, but it is likely to be one of the following, described in the section over.
Construction

Offshore Cable

There are a number of construction methods that could be used in sand and soft to hard clays, which are as follows:

- pre-lay dredging: this produces a wide trench where mechanical backfilling may be necessary to provide complete cover over the cable following installation;
- cable ploughs: these are designed to provide the minimum of soil disturbance and may be operated simultaneously during lay or from a separate vessel following completion of the laying operation; and
- Jetting trenchers: these are capable of achieving burial depths in excess of 2 m in soft clays and sands.

Cable protection is typically required at each end of the cables close to offshore structures between the burial point and the transition to the vertical or areas where burial is not suitable. Typical cable protection solutions include covering the cable with concrete mattresses. More novel solutions such as the use of wire mesh nets filled with rocks could also be considered.

Onshore Cable

It is likely that the onshore cable will be underground and so for installation, removed soil could be temporarily stored at the side of each trench and could be used to backfill the trenches after the cables have been installed. The preferred technique for undertaking this construction work has as yet not been identified. Directional drilling may be employed for short sections of their route to avoid impacts in sensitive areas.

Jointing pits will be required approximately every 0.5 – 1 km (to connect the sections of cable together), each jointing pit may be up to 15 m by 10 m by 5 m deep. The installation of the jointing pits will likely involve:

- Mechanical excavation of jointing pit hole, excavation may be slightly larger than jointing pit dimensions. Excavated material may either be used as backfill or removed from site and suitably disposed of;
- Placement of jointing pit; and
- Temporary backfill of jointing pit until ready to receive cables.
Proposed Development

Description

Substation

Construction of the substation will comprise a number of key elements:

- Foundations will be designed and created to accommodate the weight and scale of the electrical equipment.
- Some of the equipment may be housed whilst other will be uncovered and external.

Construction is likely to take approximately two years.

Decommissioning of Transmission Works

The Environmental Statement is required to report on the likely significant impacts relating to the decommissioning of the Transmission Works. There are a number of factors and options that will determine any decommissioning strategy (for example, warranty and design life of key components).

The most likely decommissioning option(s) will be considered and assessed as part of the EIA process and will be reported in the Environmental Statement.

It is likely that a decommissioning plan will be prepared prior to the eventual decommissioning process to ensure all consent requirements, environmental impacts, and mitigation measures are fully understood and reported.

2.4 Significant Adjacent Projects

There are two known significant projects in close proximity to the Beatrice Transmission Works:

1. Scottish Hydro Electric Transmission Limited (SHETL) are planning a HVDC Connection to provide a high capacity electricity connection between the GB Transmission System and renewable energy projects on Shetland. Their proposed cable route may be in close proximity to the Beatrice Wind Farm and Transmission Works and close liaison with SHETL will be required.

2. Moray Offshore Renewables Limited (MORL) is proposing to build a wind farm to the south and east of Beatrice Offshore Wind Farm. MORL is proposing an installed capacity of between 1.3-1.5 GW of offshore wind within the Moray Firth Round 3 Zone. Their cable is expected to take a different route from BOWL and unlikely to be in close proximity.

Figure 2.2 indicates the location of these proposed developments.
Given the scale, nature and proximity of these developments, the issue of cumulative impacts will be a key consideration within the Environmental Impact Assessment (EIA) process for each proposed project.
**3 OFFSHORE CABLE ROUTE**

**3.1 INTRODUCTION**

This section provides a description of the existing environmental conditions for each topic area and the potential impacts of constructing, operating and decommissioning the offshore grid connection cable. The proposed EIA studies, surveys and assessment methodologies for each topic area are also presented. The following sections provide an introduction, a description of the baseline and a summary of potential impacts and an outline of the proposed studies, methods and assessment to be undertaken at the EIA stage. It is not anticipated that the marine cable will present significant environmental issues for either installation or operation. The OSPAR Commission study ‘Assessment of the environmental impacts of cables’ published in 2009 found that if sensitive benthic habitats and contaminated sediments were not disturbed that cable placement in Region II (the Greater North Sea) would be of low intensity in terms of environmental effects and that operationally the only potentially significant effects expected would relate to the generation of electromagnetic fields and heat.

**3.2 PHYSICAL ENVIRONMENT**

**3.2.1 Coastal Processes and Geology**

*Baseline*

Coastal processes and geology encompass the physical environment and processes which may in turn affect biological and human receptors.

*Tidal Range*

The variation in tidal range through the Moray Firth can be illustrated using a co-tidal chart (*Figure 3.1*), with the most widely available information being derived from the Renewables Atlas (ABPmer *et al*, 2008)(1). This figure indicates that, within the Beatrice Transmission Works corridor, tidal range varies between 2.59 – 3.00 m and 3.22 - 3.34 m at spring tides and 1.28 – 1.39 m and 1.78 -1.96 m at neap tides, with tidal range generally increasing south and westwards with distance along the Beatrice Transmission Works corridor.

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Tidal Currents

The relevant data for tidal currents (ABPmer et al, 2008)(1) indicates that peak currents vary between 0.45 – 0.54 m s⁻¹ during a mean spring tide, and 0.24 -0.3 m s⁻¹ during a mean neap tide. Spatially, current speeds generally decrease towards the south and west.

Non-Tidal Influences of Sea Level and Currents

Non-tidal surges are formed by rapid or significant changes in atmospheric pressure. These effects can cause water levels to fluctuate considerably above or below the predicted tidal level and have the potential to modify predicted current vectors within the Beatrice Transmission Works corridor.

Marine currents and circulation are also of influence on local hydrodynamics, the general pattern in the North Sea off the north east of Scotland is for water to move south from Orkney and Shetland down the east coast toward Rattray Head. It is noted that within areas such as the Moray Firth where the Beatrice Transmission Works corridor lies localised variation and eddies in the predominant southerly offshore current may occur.

The development of the Beatrice Transmission Works will also need to take account of predicted sea level rise in Scotland, particularly at the land – water interface.

Wave Regime

Figure 3.2 indicates that within the Beatrice Transmission Works corridor there is an annual mean significant wave height ranging between 1.33 and 1.54 m. Instantaneous significant wave heights of 2-2.5 m are experienced in the Outer Moray Firth (east of a line from Helmsdale to Lossiemouth for approximately 10 % of the year)(1).

The largest waves encountered within the Moray Firth typically originate in the North Sea and approach the Beatrice Transmission Works corridor from northerly through easterly or south-easterly sectors where the available fetch is relatively large. Wave heights are smaller and more spatially variable when the wind is from other directional sectors, due to the more limited fetch. Metocean equipment relevant to the study is illustrated in Figure 3.3.

(1) Comber, D P M , Hansom J D , Fahy F M , 1994 Culbin Sands, Culbin Forest and Findhorn Bay SSSI Documentation and management, SNH
Proposed Scope of the EIA

Marine Sedimentary Regime

Seabed Deposits

The Quaternary units comprise medium dense to very dense fine to coarse sand and stiff clay, isolated cobbles and boulders and are 15-30 m thick (up to 50 m locally). The underlying Lower Cretaceous deposits are hard to very hard clay with layers of fine sand and mica, clayey siltstone and sandstone.

A desk-based geotechnical site evaluation was undertaken on behalf of BOWL by Senergy Survey & GeoEngineering Ltd(1). They report that the cable trenching would be likely to encounter ‘sand’ within the target trench depth for the majority of the Beatrice Transmission Works corridor. Figure 3.4 indicates that the cable will be likely to encounter the following deposits moving south from the BOWL site to the coast: Slightly Gravelly Sand, Sand and Gravelly Sand, Sandy Gravel, Sand, Muddy Sand, Sandy Mud, Sand and Gravel.

Off Lossiemouth on the south coast of the Moray Firth, at the mouth of the River Spey, there is over 100 km² of gravel deposits. Smaller patches of gravel are found along the north west coast of the Moray Firth(2).

In the Inner Moray Firth, within the SAC (west of a line from Helmsdale to Lossiemouth), there are sandbanks that qualify as Annex I habitats.

Seabed Mobility

Marine sediment is thought to generally enter the Moray Firth from the north and migrates out to the south east(3). Sediment transport rates and directions within the firth will, however, vary spatially and temporally depending upon the interaction between wind, waves and tidal and other currents and the local effect of deep channels, bank features, river discharges and firths and headlands. The proposed Burial Protection Index study(1) and trenching specification developed for the cable route should evaluate sediment mobility issues.

Local sediment transport is thought to be intermittent (limited in frequency) and related to low-frequency, high energy (i.e. storm) events(4).

(1) Senergy Survey and GeoEngineering, Beatrice Offshore Windfarm Geotechnical Site Evaluation, July 2009
(3) Reid G & McManus J (1987) Sediment exchanges along the coastal margin of the Moray Firth, eastern Scotland Journal of the Geological Society 144 179-185
It is likely that sediment mobility varies spatially across the Beatrice Transmission Works corridor, due to variations in water depth and relative exposure to waves, tides, and other currents.
Proposed Scope of the EIA

Suspended Sediment Concentrations

The currently available seabed sediment mapping (refer to Figure 3.4) indicates material dominated by sands, though some muds are mapped in the cable route. Typically suspended sediments concentrations may be lower (for a given hydrodynamic energy level) than in areas dominated by fine silt fractions. It is likely that natural cycles of suspended sediments occur with intermittent peaks of concentrations, for example associated with storms, with a magnitude influenced locally by the wave intensity and water depth.

An ecosystem model was used in Baxter et al. (2008)(1) to provide a map of suspended sediment concentration in the North Sea, including the Moray Firth. The reported range of mean concentration values in the firth was less than approximately 5-10 mg/l.

Potential Impacts

Potential impacts of the Beatrice Transmission Works cable during each project phase have been identified using the guidance provided by Cefas (2004)(2) and COWRIE (2009)(3).

Potential impacts during the construction and decommissioning phases have been identified as the following.

- Increase in suspended sediment concentration and associated turbidity and sedimentation during installation/removal of cables, or the initial phases of seabed scouring around new structures such as cable anchors.
- Seabed disturbance, compaction or smothering in the footprint and surrounding area of cables and associated infrastructure during construction, leading to increased environmental stress, displacement of motile species and mortality of sessile marine life in these areas.

Impacts to the underlying geology of the area are unlikely during any project phase and it is proposed that the topic area of Geology will be scoped out of the marine aspects of the cable EIA.

It is not considered that there will be any significant impacts on the marine physical environment as a result of the operation of the cable. There is the potential (depending on design specification) for locally elevated temperature and/or electromagnetic fields but these would be unlikely to have any significant effect on

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(1) Baxter, J M., Boyd, I L., Cox, M., Cunningham, L., Holmes, P., Moffat, C F. (Editors), 2008   Scotland’s Seas Towards Understanding their State   Fisheries Research Services, Aberdeen pp 174
(3) COWRIE, 2009 Coastal Process Modelling for Offshore Windfarm Environmental Impact Assessment Best Practice Guide www.offshorewindfarms.co.uk
Proposed Scope of the EIA

Physical environmental receptors but are considered later in relation to potential biological receptors. Maintenance activities would potentially result in impacts such as those associated with construction.

Potential cumulative and in-combination effects on coastal processes can be identified at this stage as those listed below.

- The interaction between plumes of sediment created by the coincident installation of turbine foundations/superstructures or burial of inter-array cables as part of the Beatrice Offshore Wind Farm and the Moray Firth Round 3 Zone Wind Farm and cable developments during the construction phase, leading to elevated levels of turbidity and suspended sediment concentration or rates or thicknesses of sediment deposition, impacting on sensitive receptors.
- Changes in patterns of tidal currents and wave activity as a result of other activities at the Beatrice Offshore Wind Farm or Moray Firth Round 3 Zone Wind Farm sites may have cumulative and in-combination effects in the cable route area and potentially affect the cable.

Studies, Methods and Assessment

Each of the potential impacts identified in the previous section will be considered as part of the EIA according to the best practice guidance found in COWRIE (2009) and with due regard to the Scoping Opinion and associated consultations.

It will initially be necessary to identify and characterise any sensitive receptors present which might be potentially impacted by the cable as a result of changes/impacts on coastal processes.

In relation to the potential data requirements to inform the assessment a review of existing environmental data has been undertaken covering the following.

- Bathymetry.
- Sediments.
- Waves.
- Tidal water levels.
- Tidal currents.

An understanding of the baseline sediment transport processes and pathways (without the wind farm structures and cable in place) will be developed through the following approaches.

- A review of the geophysical survey data for bedform orientation and asymmetry.
- A review of the geophysical survey data to characterize the distribution of sediment type.
- A review of any relevant previous studies.
• Modelling of sediment transport pathways.

A site survey strategy (including geophysics and geotechnical assessment) has been prepared for BOWL by Senergy Survey and GeoEngineering to aid in understanding of coastal processes.

### 3.2.2 Air Quality

The installation process will require the use of a cable laying vessel which will produce emissions during operation. In addition there may be smaller ancillary vessels used in support. While these will produce some emissions these vessels will be required to be fully UK licensed vessels and compliant will all necessary standards for emissions. The vessels will be at sea at distance from any population centres and in an area of relatively high vessel traffic and other marine use. As such the temporary presence of vessels associated with the cable installation would not be expected to have a significant environmental impact. It is proposed that air quality be scoped out of the assessment as no significant positive or negative impacts of significance are anticipated.

### 3.2.3 Noise

#### Baseline

The noise assessment will be split between underwater and airborne noise. Any noise associated with cable installation will also occur for a relatively short period (installation rates of greater than 1 km/day are expected) and would occur over a small area at any one time. Effects may be cumulative if they occur at the same time as other noise sources such as the nearby wind farms operated by BOWL and MORL.

#### Underwater

The existing underwater noise environment along the cable route is not yet known. Ambient noise levels in the marine environment are highly variable. Ambient underwater noise comprises a variety of individual sources, some of which are man-made and some natural. Man-made sources of underwater noise include shipping and fishing and potentially construction activities at the nearby wind farms sites and oil platforms depending on timing and work at oil and gas sites. Naturally occurring marine noise includes sources such as breaking waves, wind, rain, bed load/sediment transport movement and animal calls. Ambient noise levels in coastal environments are generally higher than in offshore environments.

#### Airborne

The existing ambient noise levels at terrestrial receptors are not yet known there are no significant marine airborne noise receptors identified. The area is subject to a range of vessel traffic and marine use which could potentially generate airborne noise and affect terrestrial receptors.
Potential Impacts

Underwater

Potential underwater noise impacts from marine activities during cable construction and decommissioning have been identified as follows.

- Noisy activities such as vessel transit, anchor handling, vessel positioning and trenching.

These activities have the potential to generate noise at levels which may be within the auditory range of marine mammals and fish and potentially marine birdlife.

Higher levels of noise can result in behavioural responses, or at much higher sound levels, can result in temporary or permanent impairment of hearing systems\(^{(1)}\). The key receptors to underwater noise are likely to include bottlenose dolphins, harbour porpoises, grey seals, common (or harbour) seals, minke whales and salmon. The cable route will pass an area used by bottlenose dolphins close to the Morayshire coast. The cable route will also pass through, or close to fish spawning grounds. Any such areas will be identified and the potential noise impact assessed.

Due to the nature of the proposed works marine noise related to the cable laying construction will be likely to be of a lower significance than those relating to works on the wind farm site because noise levels are likely to be lower, more akin to existing background noise associated with vessels using the area and will occur for a shorter period of time.

Potential noise impacts from marine activities are most likely to occur during construction and decommissioning. Potential noise impacts from marine activities during operational phases are unlikely to occur unless maintenance were required in which case effects would be expected to be similar to construction or decommissioning. Given that no significant noise source will exist, operational noise will not be assessed for the cable in the EIA studies.

Airborne

Potential airborne noise impacts from marine activities during construction and decommissioning have been identified as follows.

- Noisy activities such as manoeuvring large vessels and cable laying has the potential to adversely affect sensitive receptors.

\(^{(1)}\) COWRIE (2006), Effects of offshore wind farm noise on marine mammals and fish
Proposed Scope of the EIA

There will be no operational impacts on airborne noise unless cable maintenance was required in which case effects would be expected to be similar to construction or decommissioning. Potential airborne noise impacts from marine sources during construction are likely to be minimal. Given this it is proposed that marine airborne noise be scoped out of the EIA.

Potential cumulative and in-combination effects resulting from noise can be identified at this stage as follows.

- It is possible that cumulative underwater noise impacts may arise from the cable being installed/decommissioned in parallel or in sequence with Beatrice Wind Farm and or nearby MORL Wind Farm and Transmission Works.

Studies, Methods and Assessment

A specialist will be contracted by BOWL to undertake the required data gathering and assessments in relation to noise impacts. If required the underwater noise source levels and duration of use for the cable laying and any relevant operational equipment to be used will be obtained. This information would be used to undertake a predictive modelling of the anticipated likely worst case underwater noise levels arising from the cable. These predictions would then be referenced against the distribution and population of sensitive marine mammals and fish to determine impact levels. Impacts on fish and marine mammals are discussed below in Section 3.7 and 3.8.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Plankton

Phytoplankton off the north east coast of Scotland are influenced by inflowing Atlantic waters and are dominated by diatoms, dinoflagellates and pico/nanoplankton (the smallest plankton groups). The most frequently recorded taxa are dinoflagellates (Ceratium) which are increasingly dominating phytoplankton populations\(^1\). Planktonic blooms in spring and autumn have increased in recent years as has primary productivity overall\(^2\).

Zooplankton populations are dominated by copepods, particularly Calanus helgolandicus and Calanus finmarchicus. Meroplankton are the larval stages of bottom living (benthic) species. They include

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\(^1\) DTI, 2004a. Strategic Environmental Assessment of parts of the northern and central North Sea to the east of the Scottish mainland, Orkney and Shetland. SEA 5, May, 2004

\(^2\) Marine Scotland, 2010 The Plan for Offshore Wind Energy in Scottish Territorial Waters
Proposed Scope of the EIA

echinoderms (starfish and sea urchins), decapods (crabs and lobsters) and coelenterates (jellyfish). The higher concentrations of meroplankton in the North Sea are not observed off the north east coast of Scotland.

Megaplankton are much larger zooplankton and include euphausiids (krill), thaliacea (salps and doliolids), siphonophores and medusae (coelenterates). This group are more abundant off the north east coast of Scotland than in the rest of the North Sea but their numbers have been declining\(^{(1)}\).

It is not anticipated that plankton will be significantly affected by the Beatrice Transmission Works so it is proposed that this topic is scoped out of the EIA.

3.3.2 Seabed Marine Life

Baseline

The tolerance of seabed marine life to the potential impacts of the cable lay and operation depend upon the nature of the specific receptor, its motility, tolerance to disturbance and ability to recover from disturbance and stress. Any impacts occurring will do so over a limited area, but over a relatively long distance along the route. The data on sea bed composition currently available indicate that for most of the cable route that the cable will pass though softer bed materials sediments which may already be subject to natural bedform movement disturbance.

The seabed marine life (benthic infauna and epifauna) of the Beatrice Transmission Works corridor is currently somewhat less studied than that of nearby sites such as the BOWL and MORL Windfarm, sites subject to recent work, and supplemented with data from a number of additional separate surveys available including the ‘UK Benthos Database\(^{(2)}\)’ and Kunitzer \textit{et al} \(^{(3)}\). It is noted that much of the available information is based on surveys associated with the oil field developments along with the Beatrice demonstrator project site. Seabed sediment classification mapping of the area should allow inference of commonalities between the study areas and provide more information on likely conditions along the cable route.

There is also additional mapping based information such as the predicted EUSeaMap seabed habitat classification for the Beatrice Transmission Works corridor\(^{(4)}\). The Beatrice Transmission Works corridor

\(^{(1)}\) SEA2 An Overview of Plankton Ecology in the North Sea www.offshore-sea.org.uk
\(^{(2)}\) www.oilandgasuk.co.uk/knowledgecentre
\(^{(3)}\) Reviewed in Eleftheriou, A, Basford, D, Moore, D C., 2004 Synthesis of Information on the Benthos of Area SEA 5, DTI (www.offshore-sea.org.uk)
\(^{(4)}\) eg www.searchmesh.net
Proposed Scope of the EIA

passes through a number of predicted marine habitat types including circalittoral muddy sands, infralittoral fine or muddy sands, infralittoral coarse sediment, deep circa littoral mud[2].

From studies conducted within the Moray Firth data indicates that the animal communities living within the seabed (infauna) are dominated by bivalve molluscs, polychaete worms and the amphipod crustaceans. On the surface of the seabed the animal community (epifauna) is dominated by sponges and bryozoans growing on the occasional rocky or stony habitat within the predominantly sandy seabed. The large northern anemone (Bolocera tuediae) and the common northern spider crab (Hyas coarctatus) have also been recorded in more recent surveys on the Smith Bank.

Commercial shellfish species occur throughout the Moray Firth. The Norway lobster (Nephrops norvegicus) is found in muddy areas of the Outer Moray Firth and into the central North Sea whilst the sandier sediments of the sandbanks in the Outer Moray Firth are suitable habitat for the king scallop (Pecten maximus).

There are a number of other commercially exploited shellfish species which are found in the Moray Firth, principally lobster, edible crab, whelks, razorfish, cockles, and mussels.

The large horse mussel (Modiolus modiolus) is common throughout the Moray Firth, although its abundance on the cable route is not known at present. More recently the introduced mussel species Magellan mussel (Aulaomya ater) has been recorded in the Moray Firth, however its abundance within the Beatrice Transmission Works corridor is unknown at present.

Dornoch Firth SAC is designated for multiple Annex I habitats. It is a fine example of a largely unaltered, un-industrialised estuary. Within the overall designation the firth hosts extensive areas of mudflats and sandflats.

Potential Impacts

Potential impacts during construction and decommissioning may include the following.

- Seabed disturbance and habitat loss from the installation of the seabed cables and vessel anchoring or securing cable on hard ground.

Following the laying of cables in trenches/by plough (methods of installation to be determined) it is anticipated that most seabed habitats would restore relatively quickly and marine communities would re-
colonise and recover within a few years as evidenced by recovery of soft seabed habitats at aggregate sites\(^1\). There may be minor potential for introduction of new habitat via cable anchoring structures (if required) though these are unlikely to be significant in comparison to the main turbine array and associated seabed infrastructure at the Beatrice Offshore Wind Farm site.

Potential impacts on benthic fauna during the operational phase include the following.

- Impacts on benthic communities related to thermal load on surrounding sediments and waters and the intermittent\(^2\).
- Impacts on benthic communities due to the presence of electro-magnetic fields and the intermittent nature of these.

The construction of wind turbine foundations and cables at the BOWL and MORL wind farm sites may have some localised impacts on tidal flows/currents and water column mixing, sediment transport and suspended sediments. Over the wider area, the impacts are likely to be comparatively small and may result in small changes in the benthic communities associated with these areas. This may have a cumulative impact on benthic communities within the footprint of the cable route.

**Studies, Methods and Assessment**

It is considered likely that there is already sufficient contextual survey data for the benthic communities of Outer Moray Firth and the cable route. It is recognised that further site specific information is required to allow the assessment of impacts on the benthic communities within the cable route. As a result it is intended that a number of survey techniques are used to gather information on the marine ecology of the area of the cable route. The proposed survey approach as outlined below has been agreed in principal with Marine Scotland.

- Using the geophysical survey data (from proposed cable route survey), broad seabed types and features, including any areas of hard ground, boulder groups and biogenic reefs, can be identified.
- To be able to assess the epibenthic fauna, a campaign of drop down video will be undertaken and analysed to provide semi-quantitative data.

\(^1\) Newell et al (1998)
\(^2\) Intermittent power supply which may occur from wind farms, which may for example shut down in high wind, may result in intermittent EM field and thermal load associated with cables which will have different affects from a constant power supply
3.3.3 Fish Ecology

Baseline

The Moray Firth includes a number of areas which are important in terms of fish ecology. There are fish nurseries, spawning grounds and migratory routes of some fish species within the Firth. The Berriedale and Langwell, Oykel, Morriston and Spey SACs are all riverine SACs which discharge into the Moray Firth and have been designated to protect salmon and other migratory diadromous fish.

The Beatrice Transmission Works corridor crosses a number of spawning and/or nursery areas for a variety of fish species. The obtained SeaZone data presented in Figures 3.5 to 3.8 illustrate the likely spawning and nursery areas within the boundary of the Beatrice Transmission Works corridor for relevant species which include the following.

- **Nursery:** plaice (Pleuronectes pletassa); haddock (Melanogrammus aeglefinus); lemon sole (Microstomus kitt); sandeel (Ammodytes marinus); herring (Clupea harengus); whiting (Merlangius merlangus) and Norway lobster.
- **Spawning:** cod (Gadus morhua); lemon sole; whiting; sprat (Sprattus sprattus); plaice; sandeel and Norway lobster.
Figure 3.7

Moray Firth Fish Spawning
Offshore Cable Scoping Study

BEA_MAP_ENG_OFFS_SSER_007
17/05/2011
A4

BEA Offshore Wind Farm

WGS84
UTM Zone 30N
This map contains TCarta Bathymetry 2009. © British Crown and Seazine Solutions Limited. All rights reserved.
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Territorial Waters Boundary
Sprat Spawning
Plaice Spawning
Sandeel Spawning
Nephrops Spawning

Beatrice Offshore Wind Farm Site Boundary
Offshore Cable Route Study Area
MORL Offshore Wind Farm Site Boundary

Figure 3.8
Moray Firth Fish Spawning
Offshore Cable Scoping Study

Datum: WGS84
Projection: UTM.Zone 30N

Scale: 1:650,000
Revision: 05
Datum: WGS84
Projection: UTM.Zone 30N
Herring also spawn within the Moray Firth. Their location varies within the Firth from year to year. Typically they are more commonly found to the north and west of the BOWL wind farm site.

The Moray Firth supports a range of commercially valuable fish and shellfish which are discussed in Section 3.14.

The major rivers of the Moray Firth are amongst the finest salmonid rivers in Scotland. Salmon and sea trout fisheries are discussed in further detail in Section 3.15. It is known that salmonids and other diadromous(1) species recorded in the rivers (lamprey species and eels) will pass through the Moray Firth. The River Spey supports important numbers of sea lamprey (Petromyzon marinus) and they are listed as a primary reason for site selection of the River Spey SAC. There are also occasional records of Allis shad (Alosa alosa) and Twaiete shad (Alosa fallax) within the Moray Firth but they are relatively rare.

Basking shark are not a common species but are observed during most summers within the Moray Firth.

**Potential Impacts**

Potential impacts during construction/installation and decommissioning include the following.

- Localised seabed disturbance increase in suspended sediments during installation/removal of cable and seabed structures may in turn locally impact on fish feeding and spawning patterns.
- Loss of benthic species prey items in the vicinity of the works.

During construction and decommissioning the impact on the demersal and pelagic fish populations in the Moray Firth is likely to be very small and is scoped out from further assessment.

During operation there is the potential for electromagnetic fields to have some effect on sensitive fish populations both resident and transitory, a group being elasmobranch species which are sensitive to such fields.

Potential cumulative and in-combination effects on fish can be identified at this stage as follows.

- Localised seabed disturbance resulting from the cable installation/removal and in parallel or in sequence with the associated BOWL Wind Farm and nearby MORL Wind Farm projects.

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(1) Diadromous species use both fresh and saltwater environments during their life cycle and migrate between them.
Studies, Methods and Assessment

Following a review of available information on fish populations and ecology in the Beatrice Transmission Works corridor additional studies will be undertaken to assess the fish populations utilising the area.

3.3.4 Marine Mammals

Baseline

The Inner Moray Firth is an important and protected area for marine mammals a wide range of which may be found in these waters either as resident populations or seasonal visitors. These include cetaceans (whales, dolphins, porpoises), lutrinae (otters) and pinnipeds (seals). Species forming the focus of the baseline presented in this Scoping Report are as follows.

- Bottlenose dolphin.
- White-beaked dolphin.
- Common dolphin.
- Minke whale.
- Harbour porpoise.
- Common porpoise.
- Otter.
- Common seal.
- Grey seal.

The Inner Moray Firth is internationally renowned for the presence of the UK’s largest populations of resident bottlenose dolphin and is the largest marine SAC in the UK. The Moray Firth bottlenose dolphins tend to be larger than average size which may be connected to them being towards the Northern end of their global range. The population is estimated to be around 130 individuals.

The different dolphin species in the Moray Firth are comparatively well studied, with Aberdeen University’s Cromarty Research station taking a leading role in research alongside the Sea Mammal Research Unit, other academic organisations and international, national and local voluntary conservation bodies. A report by the Cromarty Research Station published on 25 January 2010 provides a comprehensive review of the existing cetacean survey data in the area from 1980 to 2008 and from a study undertaken from May to October 2009(1). The report reviewed the following data.

(1) Thomson, P et al 2010, Assessing the Potential Impact of Oil and Gas
Proposed Scope of the EIA

- Peer-reviewed journals and unpublished (grey) literature.
- Unpublished data from the following.
  - The University of Aberdeen.
  - The Whale and Dolphin Conservation Society (WDCS).
  - The Cetacean Research and Rescue Centre (CRRU).
  - The Royal Society for the Protection of Birds (RSPB).
  - The European Seabirds at Sea database.
  - Reports from Marine Mammal Observers aboard seismic vessels provided by the Joint Nature Conservation Committee (JNCC).
  - Data collected during the SCANS II survey which was provided by the Sea Mammal Research Unit (SMRU).

The following generalisations were made about the distribution of key cetacean species in the Moray Firth.

- Bottlenose dolphin sightings have all been within 15 km of the coast in the inner part of the Moray Firth SAC and the coastal area along the southern Moray Firth. Whilst a few counts of bottlenose dolphin have been made in offshore waters, these are likely to be miscounts of common dolphins or white beaked dolphins.
- There is some evidence that relative abundance of white beaked dolphin and common dolphin appears to have changed over the 30 year survey period with the former becoming relatively less abundant.
- Minke whale are the second most commonly sighted species in offshore waters after harbour porpoises. This appears to be a more recent trend as earlier datasets had comparatively fewer sightings.
- Harbour porpoise are the most commonly encountered species and are seen throughout the inshore and offshore waters of the Moray Firth.
- Common porpoise are known to be present within the Moray Firth throughout the year. Sightings are geographically spread throughout the area but tend to be further offshore than the bottlenose dolphin sightings.

The Moray Firth supports important breeding populations of **common seal**, particularly within the Dornoch Firth and other firths. The population of common seal in the Moray Firth is estimated to be around 1,200 to 1,400. Common seal are often considered a coastal species but are able to forage in more offshore areas, particularly sandbanks where they feed on sandeels, herring and other clupeid fish. The
seals are known to feed up to 40-50 km from their haul out sites (sites on land where they rest, mate and birth)(1).

**Grey seal** breed on rocky shores along the coast of the Moray Firth. Grey seal numbers in the Moray Firth have ranged from 200 to 900 during the period 1992–2003 following annual surveys. Grey seal will forage close to the seabed principally predating bottom living fish species such as sandeel, flatfish and white fish (cod, haddock and ling). Grey seal are known to range over larger distances than common seal.

There has been conflict between seals and salmon fisheries in the Moray Firth for many years with both salmon and seal numbers decreasing in recent years. With the introduction of SACs to protect seals and salmon, the Moray Firth Seal Management Plan was put in place in April 2005 to try to protect both seal and salmon populations. The plan shows that whilst numbers have been decreasing, overall there are large numbers of both common and grey seal in the inshore and offshore areas of the Moray Firth.

In addition, several other species of marine mammal have been sighted seasonally and occasionally within the Moray Firth in recent years.

- Long-finned pilot whale.
- Killer whale.
- Humpback whale.
- Fin whale.
- Sperm whale
- Atlantic white-sided dolphin.
- Risso’s dolphin.
- Striped dolphin.

**Otters** are widely recorded in the rivers and coasts of the Moray Firth, they will also be included within the terrestrial ecology section within *Section 4.4*.

**Potential Impacts**

Potential impacts on marine mammals during construction and decommissioning may include the following:

- Physical disturbance due to vessel movements, anchoring, dynamic positioning and cable laying.

Downloaded on 2nd February 2010
Proposed Scope of the EIA

- Food chain impacts from loss of benthos and fish which are prey items.

Potential impacts during the operational phase of the cable may include the following.

- The presence of an electromagnetic field around the cable.

Potential cumulative and in-combination impacts may include the following.

- Potential barrier effects created by the presence of networks of underwater cables and associated electromagnetic fields within the marine environment.

BOWL and MORL wind farm sites are adjacent to the offshore end of the cable so will have direct cumulative impacts on marine mammals that are found within the area. The Firth of Forth Round 3 zone and other Scottish Territorial Waters sites are much further south than the cable route but wider ranging marine mammals may be impacted by all of these proposed projects. The geographical extent of the cumulative impact to be considered as part of the EIA will be discussed and agreed with relevant consultees.

Studies, Methods and Assessment

It is clear that assessing impacts on the underwater noise environment for both the construction and operational phases of the Transmission Works will be required to ensure a robust EIA. A specialist consultant will be contracted by BOWL to undertake the required data gathering and assessments in relation to impacts on marine mammals.

Significant academic research has already been undertaken, in particular in relation to the bottlenose dolphins of the Moray Firth. Wherever possible, BOWL will seek opportunities to collaborate with academic researchers to maximise the applicability of this research to the Transmission Works.

Two 100-130 km transects of C-PODs have been put in place within the Moray Firth to monitor small cetaceans by Passive Acoustic Monitoring (see Figure 3.9). Initial results demonstrate bottlenose dolphins tend to live along the Inner Moray Firth and the southern coastline of the Moray Firth. As part of the full EIA, the University of Aberdeen will be consulted to ensure the most up to date survey data is incorporated into the EIA.

Published best practice guides will be used to ensure the EIA includes all relevant information and follows best practice on assessing impacts to marine mammals. This guidance will include but is not limited to those below.
Proposed Scope of the EIA

- COWRIE’s guidance documents including ‘Measurement and interpretation of underwater noise during construction and operation of offshore wind farms in UK waters’(2).

3.3.5 Ornithology

The coastal and offshore waters of the Moray Firth are internationally important for populations of seabirds, seaduck, wader and wildfowl. Within the Moray Firth there are several protected areas that have been designated to protect these populations and it has been classified as Special Protection Area (SPA) under the EU Birds Directive (see Figure 3.10).

Protected areas include:
- Loch Strathbeg SPA and Ramsar.
- Troup, Pennan and Lion’s Heads SPA.
- The Moray and Nairn Coast SPA and Ramsar.
- The Inner Moray Firth SPA and Ramsar.
- Cromarty Firth SPA and Ramsar.
- The Dornoch Firth SPA and Ramsar.
- The East Caithness Cliffs SPA.

The eastern coastal section of the Scottish north coast between Peterhead and Duncansby Head contains seven SPAs. Of these, five are also designated as Ramsar sites. It is likely that there will be some degree of interchange between bird populations using these sites and other sites around the UK coast. Large concentrations of seabirds are found in the Moray Firth during the breeding season (April – June). Species such as auks (guillemot, razorbill and puffin) then disperse to feeding grounds further offshore to feed on sandeel and other prey fish species.

Overwintering species in the Moray Firth include seaducks (eider (*Somateria mollissima*), goldeneye (*Bucephala clangula*), long tailed duck (*Clangula hyemalis*), common scoter (*Melanitta nigra*) and velvet scoter (*Melanitta fusca*), red throated diver (*Gavia stellata*) and great crested grebe (*Podiceps cristatus*).

(2) Nedwell, J  R , Langworthy, J  & Howell, D   (2003)  Assessment of sub-sea acoustic noise and vibration from offshore wind turbines and its impact on marine wildlife; initial measurements of underwater noise during construction of offshore wind farms, and comparison with background noise  Subacoustech Report No 54480423   Published by COWRIE
Proposed Scope of the EIA

Although the Moray Firth waters are internationally important for a number of bird populations it is not considered that the proposed cable laying will result in significant impacts on ornithological receptors, and as a result it is proposed that they are scoped out of further consideration in the EIA.
Figure 3.10
Moray Firth Designated Sites
Offshore Cable Scoping Study

Legend

Beatrice Offshore Wind Farm Site Boundary
- Offshore Cable Route Study Area
- MORL Offshore Wind Farm Site Boundary
- Territorial Waters Boundary
- Local Nature Reserve, LNR
- National Nature Reserve, NNR
- Sites of Special Scientific Interest, SSSI
- Wetland of International Importance, RAMSAR
- Special Areas of Conservation, SAC
- Special Protection Areas, SPA

Bathymetry
(Metres Below Sea Level)

0m
-220m

North Sea

Moray Firth Designated Sites
Offshore Cable Scoping Study

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Datum: WGS84
Projection: UTM Zone 30N
Scale: 1:750,000

Drawn: NW
Checked: JB
Approved: JW
Date: 20/05/2011
Revision: 009

Figure 3.10
Moray Firth Designated Sites
Offshore Cable Scoping Study
3.4 HUMAN ENVIRONMENT

3.4.1 Landscape, Seascape and Visual

Although the Beatrice Transmission Works corridor lies within a sensitive area in terms of landscape, seascape and visual amenity there should be no significant impact upon these receptors as a result of the marine cable which will not be visible once laid. During installation the cable laying vessel will be visible but this will be for a short duration and in areas where marine traffic is a common sight. Impacts on landscape, seascape and visual amenity are considered to be not significant and it is proposed that this issue is scoped out of further assessment in the cable EIA.

3.4.2 Archaeology and Cultural Heritage

Baseline

There are many marine wreck sites along the Moray Firth coastline and it is likely that there are more as yet unknown wrecks within the firth. Within or bordering (within 1 km) the cable corridor boundary there are a number of known wrecks. Figure 3.11 illustrates the locations of known wreck sites (maritime, aviation and others) within the study area.

Potential Impacts

Potential cable installation and removal impacts may include the following.

- In relation to marine archaeology there is potential for construction/decommissioning activities to directly, or indirectly affect known wreck sites or other artefacts.
- There is potential that new wreck sites or other artefacts are discovered within the Beatrice Transmission Works corridor during the data gathering exercises of the EIA.

Studies, Methods and Assessment

As part of the data gathering for the EIA there will be a marine survey (see Section 3.2.1). The results of the geophysical survey work will be interpreted by specialist marine archaeologists to assess the likelihood of

(1) DTI, The scope of Strategic Environmental Assessment of North Sea Area SEA5 in regard to prehistoric archaeological remains, 1994
significant unknown wrecks or other artefacts being present in the area. Where wrecks or other artefacts are considered likely to be present it may be possible to amend cable routes to avoid them. Any new wrecks or other artefacts will be recorded and in accordance with an approved Written Scheme of Investigation.

Data searches during the baseline data gathering exercise will include reference to the following documentation.

- DTI, SEA5, The scope of Strategic Environmental Assessment of Continental Shelf Area SEA5 in regard to prehistoric archaeological remains (2004).
- Royal Commission on Historic and Ancient Monuments for Scotland, data base and web tools.
3.4.3 Aviation and Ministry of Defence

Baseline

Civil Aviation

The cable installation and operation should have no impact upon civil aviation and as such it is proposed that this is scoped out from further assessment by the Beatrice Transmission Works EIA.

Ministry of Defence (MoD)

Practice and Exercise Areas (PEXA) charts produced by the UK Hydrographic Office, identify the military activity zones within the Moray Firth area. These areas are illustrated on Figure 3.12. PEXAs are used for various military practice activities by the Royal Navy, the Army, the Royal Air Force, the Defence Estates and the MoD Police.

It is unlikely that the cable installation would have any significant effect upon air-based activities and it is proposed that these are scoped out from further assessment.

The MoD also use the Moray Firth as part of a larger marine operations area for surface and sub-surface naval activities and exercises. Figure 3.12 presents the known aviation and military interests in the vicinity of the Beatrice Transmission Works corridor.

Potential Impacts

Potential impacts during construction may include the following.

- Physical obstructions to military operations.

Potential impacts during operation are not anticipated.

Potential cumulative and in-combination effects on military operations may include the following.

- Cumulative impacts from wider activity in the local area may occur resulting in increased restriction on vessel movement and obstructions to military activity during cable laying and wind farm construction. No impacts are anticipated during operation.
**Proposed Scope of the EIA**

**Studies, Methods and Assessment**

Consultation with the MoD will be undertaken by the BOWL project team on the wind farm and cable laying operations. In addition a shipping and navigation study will be undertaken which will provide additional coverage of potential issues relating to existing and project marine traffic movements (see Section 3.15 below).

**3.4.4 Shipping and Navigation**

**Baseline**

The Moray Firth is used by a variety of vessels, fishing vessels being the most common vessel in the firth with busy fishing ports at Fraserburgh and Buckie. The presence of several ports (principally Inverness and Cromarty Firth) and the entrance to the Caledonian Canal attracts both commercial and recreational vessel traffic within the firth. Oil industry supply vessels navigate in this area in support of the Beatrice oil production complex and its satellites and drilling operations. Drilling rigs also use Nigg and Invergordon yard facilities for refitting and repair and can often shelter in the Cromarty Firth when out of contract.

A figure summarising the pattern of shipping within the Moray Firth (using 2010 Automatic Information System (AIS) data) is provided in Figure 3.13. Commercial shipping densities within the Moray Firth generally, and within the vicinity of the Beatrice Transmission Works in particular, are generally low. The main shipping route along the Moray coast is busier with 200 to 400 movements/year with the greatest density in a corridor running approximately 8 to 18 km north of the Moray coast. The main east coast shipping routes, which is located approximately 10 km to the north east of the BOWL wind farm site boundary, accommodates in excess of 1,000 shipping movements per year. It is recognised that this data only represents AIS carrying vessels and will not represent the levels of smaller fishing and recreational activities in this area.

The Royal Yachting Association publishes a Cruising Atlas detailing facilities and activities of recreational craft around the UK. There are three identified routes that pass roughly northerly/southerly through the cable route corridor and two additional routes running east–west along the coast.

The Department for Transport (DfT) Marine Statistics for 2008 indicated that the Cromarty Firth handled 2.3 million tonnes of foreign and domestic traffic and that 697,000 tonnes were handled at Inverness. In terms of arrivals, the Cromarty Firth received 169 vessels during 2008 with Inverness receiving 267. Type and size breakdowns are presented in Table 3.1.
**Table 3.1 Type and number of vessels arriving in 2008**

<table>
<thead>
<tr>
<th>Ship Type</th>
<th>No of arrivals at Cromarty Firth</th>
<th>No of arrivals at Inverness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tankers</td>
<td>49</td>
<td>158</td>
</tr>
<tr>
<td>Ro Ro</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Fully Cellular</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Other Dry Cargo</td>
<td>109</td>
<td>106</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>169</strong></td>
<td><strong>267</strong></td>
</tr>
</tbody>
</table>

These statistics do not account for offshore oil industry vessels, fishing, recreational and passenger traffic. There were 52 cruise calls into Cromarty Firth in 2008 with a total of 48,100 passengers\(^{(1)}\).

**Potential Impacts**

During construction, operation and decommissioning there is potential for the safe navigation of all vessel types to be affected. Such impacts may include those identified below.

- Collision with other vessels due to increased activities during construction and decommissioning.
- Increased risk of fishing gear and or anchor interactions with cable if routed over hard ground.

**Studies, Methods and Assessment**

The assessment will address the need for measures such as those listed below.

- Lights and markings.
- Safety zones.
- Routeing measures.
- Information to Mariners, e.g. Notices to Mariners and Kingfisher Notices.
- Guard vessel during construction if required.
- AIS, VHF and/or radar monitoring during operation.

---

\(^{(1)}\) Cromarty Firth Port Authority, annual report for the year to 31 December 2008
3.4.5 Commercial Fisheries

Baseline

There is no single data set or model which can accurately quantify the fishing effort or catch values of commercial or recreational fishing within discrete small areas of sea such as the Beatrice Transmission Works corridor. ICES statistical rectangles are currently the smallest area statistical units used for collating fisheries data. Rectangles boundaries align to 1° longitude and 30' latitude and for the most part have sea areas equating to approximately 900 nautical miles. The Beatrice Transmission Works corridor is situated almost entirely within ICES Rectangles 44E7 and 45E7.

Key commercial demersal species in the area include scallops, Norway lobster, haddock, monkfish, squid and cod with smaller levels of catch for megrim, whiting and herring. Scallop make up the highest proportion of the catch and are a nationally important fishery. The Moray Firth does not contain important fishing grounds for pelagic species such as mackerel, herring or sprat.

The main ports where fishermen who operate in the area are based or land their catches include, Fraserburgh, Buckie and Wick, and to a lesser extent Peterhead, Macduff, Scrabster, Aberdeen, Lochinver, Kinlochbervie and Ullapool.

Potential Impacts

Potential impacts during construction and decommissioning may include the following.

During construction/decommissioning fishermen will be excluded from the area around the cable laying vessel, cable and plough (or other sea bed equipment as utilised). This will potentially prevent fishermen from temporarily accessing parts of their regular fishing grounds. A cable installation rate 1 – 1.5 km per day, including for delays due to poor weather, is used for planning purposes by The Crown Estate(1) in relation to installation of marine cables in sands and muds. As a result no one area would be expected to be excluded from access to fishermen for extended periods.

In addition, the installation process may result in the disturbance to seabed sediments and associated benthos which could potentially have a temporary impact on any nearby fish spawning and feeding activity.

Potential impacts during operation may include the following.

(1) www.thecrownestate.co.uk/east_coast_transmission_network_technical_feasibility_study.pdf
• The cable may generate an electromagnetic field during transmission operation which could affect sensitive species such as rays, skate and shark.

It is likely that where possible the cable will be buried limiting operational phase impacts on fixed or mobile gear fishing operations. In areas of hard ground the cable may require to be laid on the surface and/or under protective mattresses.

Potential cumulative impacts may include the following.

• Impact of the cable and the BOWL and MORL wind farms being constructed/decommissioned in parallel or in sequence on the displacement of commercial species and fishing activities.

**Studies, Methods and Assessment**

Consultation and data gathering from published sources (overflight and landings data) will be used to describe the local fishery and identify any key sensitive periods and areas.

### 3.4.6 Salmon and Sea Trout Fisheries

**Baseline**

Salmon (*Salmo salar*) and sea trout (*Salmo trutta*) are anadromous\(^1\)(\(^2\)) migratory species, spending their adult life at sea and returning to their ‘home’ rivers to spawn. The salmon and sea trout fishery in Scotland is divided into commercial and recreational fishing with the rod and line industry forming an important part of the Scottish rural economy and with salmon fishing being a popular activity for visitors to Scotland.

The main commercial and recreational fishing methods are given in *Table 3.4*. Details of fish caught and retained in the vicinity of the Beatrice Transmission Works are shown in *Table 3.5*.

**Table 3.4  Main Fishing Methods**

<table>
<thead>
<tr>
<th>Moray Firth Fishery types</th>
<th>Commercial Fishing</th>
<th>Recreational Fishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag and Skate (fixed engines)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Net and Coble</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Rod-and-line</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

\(^1\) Anadromous species migrate from marine waers to freshwaters to breed and are a type of diadromous species  
\(^2\) Diadromous species use both fresh and saltwater environments during their life cycle and migrate between them
Table 3.5  Details of Fish Caught and Retained in the Moray Firth Area

<table>
<thead>
<tr>
<th>Moray Firth Fishery Districts</th>
<th>Salmon</th>
<th>Grilse</th>
<th>Sea trout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deveron</td>
<td>1214</td>
<td>1016</td>
<td>289</td>
</tr>
<tr>
<td>Spey</td>
<td>1743</td>
<td>1201</td>
<td>1065</td>
</tr>
<tr>
<td>Lossie</td>
<td>49</td>
<td>61</td>
<td>153</td>
</tr>
<tr>
<td>Findhorn</td>
<td>565</td>
<td>525</td>
<td>32</td>
</tr>
<tr>
<td>Nairn</td>
<td>296</td>
<td>631</td>
<td>59</td>
</tr>
<tr>
<td>Ness</td>
<td>289</td>
<td>338</td>
<td>51</td>
</tr>
<tr>
<td>Beauly</td>
<td>117</td>
<td>296</td>
<td>6</td>
</tr>
<tr>
<td>Conon and Alness</td>
<td>194</td>
<td>664</td>
<td>50</td>
</tr>
</tbody>
</table>


Note: Salmon figures are annual and include spring salmon (multi-winter, taken before 1st May) and summer salmon (multi-winter taken after 30th April). Grilse are salmon that only spend one winter at sea before returning to their natal rivers.

Potential Impacts

The main potential impacts on salmon and sea trout fisheries associated with the Beatrice Transmission Works are likely to be upon migratory behaviour. Given that the impacts on the fisheries will be directly related to the impacts on the ecology of these species, the assessment provided by the fish ecology component of the EIA will inform this section (see Section 3.7).

Studies, Methods and Assessment

The assessment of salmon and sea trout fishing activities in the area relevant to the cable route will be based on up-to-date fisheries statistics and information gathered through consultation with relevant stakeholders, such as the Fisheries Research Services (FRS Freshwater Laboratory) and Salmon District Fisheries Boards.

3.4.7 Oil and Gas

Baseline

The main oil and gas activity in the Moray Firth area at present is the Beatrice oil field (Block 11/30a). This field was discovered in 1976 and began production in 1981. The oil field has produced over 160 million barrels of oil to date. The existing oil and gas structures present in the area are illustrated on Figure 3.14 which also illustrates the locations of other known features such as wellheads, buoys and obstructions.

Key structures include the following.

- The Jacky platform.
- Beatrice Alpha, Bravo and Charlie platforms.
Proposed Scope of the EIA

- Seabed cables and pipelines linking the platforms.
- Beatrice oil is exported via a 66 km long 16 inch pipeline from the Beatrice Alpha complex to a shore terminal at Nigg in the Cromarty Firth, where it is stored until tanker shipment.
- The Beatrice complex is linked to the mainland via a 132/33 kV seabed power cable from Dunbeath. The demonstrator wind turbines provide approximately 30% of the Beatrice Alpha platform’s daily requirements.

Beatrice oil platforms are owned by Talisman Energy and operated by Ithaca Energy. The Jacky platform is owned and operated by Ithaca Energy. Existing oil and gas infrastructure will be afforded certain wayleaves and buffer zones, restricting certain types of activities and development within their proximity.

In the 23rd Licensing Round, Ithaca was also awarded, as one licence, several further blocks and part blocks which surround the Beatrice Field. The Polly field, 2.5 km east of the Beatrice oil field is an emerging opportunity and straddles blocks 11/30a and 12/26c. These are illustrated on Figure 3.13. The Polly field region has been illustrated with reference to Ithaca Energy website(1). There is interest in the potential for future hydrocarbon finds in the Moray Firth. The oil and gas group PA Resources have been awarded new licenses in the UK’s 26th Licensing Round by the UK’s Department of Energy and Climate Change, these new licensing areas 11/25b, 12/22b and 12/23b are also shown on Figure 3.14. As a result a programme of detailed seismic survey of these areas within the Moray Firth is planned for Autumn 2011.

Potential Impacts

Potential construction and decommissioning impacts may include the following.

- An increased risk of accidental damage to existing oil and gas infrastructure. This could occur, for example, as a result of cable laying activities or incidents such as vessels going adrift.

During operation no likely significant impacts predicted.

Potential cumulative or in-combination impacts include the following.

- It is possible that cumulative impacts of a similar type to those discussed above may arise from the Beatrice Transmission Works being installed and or removed in parallel or in sequence with the associated Beatrice Wind Farm and nearby MORL Wind Farm and Transmission Works.

(1) http://www.ithacaenergy.com/greater-beatrice-area.asp
Studies, Methods and Assessment

A data gathering exercise will be undertaken to confirm the location of existing structures and facilities within and around the Beatrice oil field so these can be avoided. Consultations will also take place with the platform owners and operators to understand current and future exploration and production operations.

If discussions with the operators and owners identify that no significant impacts would occur as a result of construction, operation or decommissioning of the cables then this topic area will be scoped out of the EIA. The impact to shipping activities would be assessed as part of the wider EIA (see Section 3.13).
3.4.8 Pipelines and Cables

The Kingfisher Cable Awareness Charts identify the main cable routes around the coast of the UK. In referring to these charts the closest cable to the Beatrice Transmission Works relate to a submarine power cable running north/south between Banff and Orkney (see Figure 3.14). The pipelines and cables associated with the Beatrice oil field are discussed above within Section 3.16. There is also the planned SHETL cable route which passes though the study corridor but is unlikely to be crossed by the Beatrice Transmission Works corridor and is subject to ongoing discussion between the concerned parties and MORL.

Given the distance from the Beatrice Transmission Works corridor of existing submarine cable and pipeline infrastructure it is not considered that there will be significant impact on these features as a result of constructing, operating or decommissioning the Beatrice Offshore Wind farm. Given this it is proposed that this topic area is scoped out of the EIA.

3.4.9 Marine Waste and Spoil Disposal

There are four marine disposal sites between Burghead and Macduff to the south of the Beatrice field and are located as illustrated on Figure 3.14. There is the potential that that cable route as it comes close to shore could interfere with access to the dumping ground offshore of Buckie/Cullen. However no grounds lie within the propose route. The presence of active or historic dumping grounds would be investigated as part of the routing selection study so these can be avoided.

3.4.10 Socio-economics

The Moray Firth supports a range of industries and activities, and attracts vessels to the ports at Invergordon and Inverness, and the entrance to the Caledonian Canal. It is also an important area for commercial and recreational fisheries, recreational sailing and tourism. The area is used for military training purposes and there are a number of firing practice areas and a bombing range covering areas within the firth. There are currently no marine aggregate dredging areas in the Moray Firth area.

The Caithness coastline to the north and west of the BOWL site and cable route is relatively sparsely populated. The Moray coastline to the south accommodates numerous traditional fishing villages with associated harbours, now also used as bases for recreational sailing. The coastlines of the Moray Firth encompass numerous features of cultural heritage including Listed Buildings and Scheduled Ancient Monuments.
Proposed Scope of the EIA

The cable project itself is not expected to have any significant impact on socio economics within the wider context of the ongoing BOWL and MORL developments and as such further assessment of socio economics is proposed to be scoped out of the cable assessment.
4 ONSHORE CABLE ROUTE AND SUBSTATION

4.1 INTRODUCTION

This section of the Scoping Report provides a description of the existing onshore environmental conditions as they are understood at this time. The baseline conditions are presented for each topic area and, where appropriate potential impacts of constructing, operating and decommissioning the grid connection cable route and substation. The proposed onshore EIA studies, surveys and assessment methodologies for each topic area are then presented. Where relevant, potential mitigation measures have also been suggested and potential cumulative impacts identified.

4.2 PHYSICAL ENVIRONMENT

4.2.1 Geology, Soils and Waste

Baseline

Information relating to the geology of the onshore cable route study area has been obtained from the British Geological Survey (BGS) and shown in Figure 4.1(1) and Figure 4.2(2). The majority of the proposed cable route is underlain by glacial till. Beneath this is igneous intrusion.

Potential Impacts

An assessment of any likely impacts upon geology, soils and waste, will be undertaken as part of the EIA. New developments and infrastructure may impact on geology and soils through direct loss, or impacts such as compaction and erosion.

Studies, Methods and Assessment

A desk study will be undertaken to determine the historical land use of the study area, its geology and any areas of contaminated land. The following information sources will be consulted:

- Envirocheck Report for the convertor station site area;
- BGS Geological Maps;
- Agricultural Land Classifications;

Proposed Scope of the EIA

- Contaminated land records held by Moray Council; and
- Contaminated land records held by Scottish Environment Protection Agency (SEPA).

The EIA will include a high level assessment of the effects upon geology, soils and waste. At possible landfall sites there are two SSSIs (see Figure 4.4), the Spey Bay SSSI and the Cullen to Stakeness Coast SSSI both sites are designated for geological quality and therefore careful construction techniques will be identified to protect these SSSI. Further consultation with SNH will be required regarding the construction techniques at this location. However, along the remaining sections of the cable route, it is likely that impacts will not be significant.


4.2.2 Water Environment

Baseline

It will be important to ensure that impacts from the development on hydrology and water resources are appropriately considered for the EIA. The main guidance and policies which will be taken account of during the EIA include, but are not limited to, the following:

- Water Framework Directive (2006/60/EC);
- Water Environment and Water Services (Scotland) Act 2003;
- Scottish Planning Policy; and
- The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CARS).

There are a number of small watercourses that will need to be crossed as a result of the Transmission Works (see Figure 4.3). The watercourses will be surveyed during the extended ecology Phase 1 survey to identify any protected species and species of interest. Groundwater, flood zones and private water supplies will be identified within the baseline data gathering.

Potential Impacts

An assessment of any likely impacts upon the water environment, and upon any private water supplies, will be undertaken as part of the EIA. The development may potentially affect the water environment of the site in the following ways.

- Impacts upon the hydrological regime of the site and surrounding area including impacts upon groundwater flows, surface water flows and drainage patterns.
- Impacts on groundwater and surface water flows and quality from construction activities such as earthworks, earth storage, removal of vegetation cover and fuels storage.
- Impacts upon flooding associated with drainage alterations on site.

Studies, Methods and Assessment

The assessment will be undertaken as a combination of desk based assessment and site walkover, with baseline data gathered and mitigation measures developed in consultation with the SEPA, local Internal Drainage Boards (IDBs) and Moray Council.

An initial desk-top study will be reported as part of the EIA. This will provide a review of past uses as well as providing a baseline description of the geology, hydrology and hydrogeology of the site.
Proposed Scope of the EIA

Data will be collated from the following sources:

- aerial photographs, if available;
- geological maps, both solid and drift geology;
- hydrogeological maps;
- groundwater vulnerability maps;
- soil survey maps;
- borehole records held by the British Geological Survey, the SEPA and The Moray Council. This will identify both abstractions in the locality and the current groundwater quality;
- SEPA water quality and discharge records;
- local Internal Drainage Board information and local hydrological and historical info;
- UKTAG information, including the relevant reports of the characterisation, impacts and economic analyses required by Article 5 of WFD; and
- Local Authority private water supply records.
- Walkover surveys will be undertaken to confirm the major findings of the desk study and to identify any omissions. The field survey will establish ground conditions and nearest watercourses. In the event that private water supplies are located within the catchment, these will be visited and the source mapped. Field surveys will also increase the background knowledge of the site and will aid in the development of mitigation strategies.
4.3 **BIOLOGICAL ENVIRONMENT**

4.3.1 **Ecology and Nature Conservation**

It is important that impacts from the development upon the ecology and nature conservation of the Cable Route and Converter Station and its surroundings are appropriately considered and assessed as part of the EIA. The ecological impact assessment will follow the latest guidance on baseline data collection and impact assessment methods. Detailed technical assessment such will be undertaken to inform the assessment where necessary, and opportunities to mitigate effects by careful design of the development and habitat management activities will be investigated in consultation with Moray Council, SNH, the Scottish Wildlife Trust, and the Royal Society for the Protection of Birds (RSPB).

**Baseline**

**Designations**

There are no ecological designated sites within the footprint of the Cable Route or Substation.

Designated sites that are located within the vicinity of the study corridor are included as follows (as shown on Figure 4.4).

**Internationally Designated Sites**

Moray and Nairn Coast SPA\(^{(1)}\) and Ramsar\(^{(2)}\) site:

This site is located 55 km from the study corridor. Moray and Nairn Coast SPA and Ramsar site is of European interest due to its outstanding nature conservation and scientific importance for coastal and riverine habitats; and supports a range of wetland birds throughout the year. In summer it supports nesting osprey (*pandion haliaetus*), whilst in winter it supports large numbers of Iceland/Greenland pink-footed goose (*anser brachyrhynchus*), Icelandic greylag goose (*anser anser*) and other waterbirds, especially ducks, sea-ducks and waders.

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\(^{(1)}\) A Special Protection Area is a site designated (or pending designation) under the European Directive on Conservation of Wild Birds (79/409/EEC) (known as the Birds Directive) to protect birds that are considered rare or vulnerable within the European Community and all regularly occurring migratory birds. Enacted in the UK through the Wildlife and Countryside Act, 1981 and subsequent amendments and the Conservation (Natural Habitats &c) Regulations, 1994.

\(^{(2)}\) A Ramsar Site is a site that has been designated under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (known as the Ramsar Convention) to protect internationally important wetlands.
Proposed Scope of the EIA

Lower River Spey SAC(1):
The Lower River Spey SAC is located 3.5 km from the study corridor. The Lower River Spey – Spey Bay in north-east Scotland forms part of the same shingle aggregation as Culbin Bar to the west. The site qualifies as an SAC due to Annex I habitat Perennial Vegetation of Stony Banks in the northern part of its range in the UK. Lower River Spey – Spey Bay contains significant areas of both bare and naturally vegetated parallel shingle ridges. The most significant feature of the site is the complex of wet and dry vegetation types, depending on the physical relief of the shingle ridges and hollows. Species-rich dry heath and grassland occurs on the ridges, while in the wetter hollows there is species-rich wet heath and transitions to a vegetation type comparable to that of dune slacks. In addition, the Lower River Spey is unique within Britain in comprising an extensively braided channel along the whole length of the river. The active river channel provides a mosaic of substrates, and in more stable, damper situations large stands of Annex I habitat Alluvial Forest with *alnus glutinosa* and *fraxinus excelsior* (alno-padion, alnion incane, salicion albae).

River Spey SAC/ SSSI(2)
The River Spey SAC is located 3.5 km from the study corridor. The River Spey SAC has been designated for Annex II species, fresh water pearl mussel (*margaritifera margaritifera*), sea lamprey (*petromyzon marinus*), Atlantic salmon (*salmo salar*) and otter (*lutra lutra*). The site supports an outstanding fresh water pearl mussel population; the River Spey represents the sea lamprey in the northern part of its range in the UK; and is an important otter site for populations in Scotland.

Loch Spynie SPA/ SSSI:
Loch Spynie is located within 16 km of the study corridor. It is one of the few large and naturally eutrophic waterbodies in northern Scotland. It supports a diverse aquatic flora with extensive reedbeds fringing the open water body and various stages of hydroseral succession including mesotrophic fen, willow (*salix* spp.) scrub and swamp alder (*alnus glutinosa*) woodland. The loch is of European importance as a roost for Icelandic greylag goose.

Moray Firth SAC:
The Moray Firth SAC is located 17 km from the study corridor. The Moray Firth SAC is of European importance due to being the only known resident population of bottlenose dolphin (*tursiops truncates*) in the North Sea. The population is estimated to be around 130 individuals (Wilson et al. 1999).

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(1) Special Area of Conservation is a site designated under the European Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC) (known as the Habitats Directive) to protect sites that are considered rare because of their habitats or the species contained within them. Enacted in the UK through the Conservation (Natural Habitats &c) Regulations, 1994.

(2) A Site of Special Scientific Interest is a site notified by Scottish Natural Heritage (SNH), under the provisions of the Wildlife and Countryside Act, 1981 and subsequent amendments as of national nature conservation or geological importance.
Dolphins are present all year round, and, while they range widely in the Moray Firth, they appear to favour particular areas.

**Nationally Designated Sites**

There are no nationally ecologically designated sites within the study corridor. There are two Sites of Special Scientific Interest (SSSIs) within 5km of the study corridor, but are unlikely to be affected by the project, the Tynet Burn SSSI and Mill Wood SSSI. Two additional SSSIs shown on Figure 4.4, the Spey Bay SSSI and Cullen to Stakeness Coast SSSI are both designated for geological importance as discussed in Section 4.2.1.

**Non-Statutory Designated Sites**

There are no non-statutory designated sites within the study corridor.

Within 2 km of the study corridor there are a number of long-established woodland areas, of plantation origin, that are included on the Ancient Woodland inventory (AWI). This includes Longhill Wood, Cowiemuir Wood, Wood of Auchenreath, Wood of Auchenhalrig, Pathhead Wood, Scabbed Hill Plantation, Redmoss Wood, Whiteash Hill Wood, Starryhaugh, Aultmore Forest, Mulderie Wood, Hillockhead Wood, Fife Keith Wood, Cairds Wood, Dunnyduff Wood and woodland alongside Burn of Tasnash and Den Burn.

In addition, there are three Scottish Wildlife Trust Sites within 2 km of the study corridor, including Bog Shalloch, Upper Allaloth and Cottage Wood.

**Potential Impacts**

The assessment will consider the potential impacts from the development on designated sites, habitats, flora and fauna of nature conservation interest on site and in the surrounding area during construction and operation. The significance of the impacts will be determined using standard impact assessment methods and criteria (IEEM, 2006) taking into account the magnitude of the impact and the nature conservation value of affected receptors. Potential impacts will be described and mitigation and enhancement measures will be developed to reduce these impacts.

The ecological impact assessment presented in the ES will include sufficient information on the impacts predicted on the designated sites to enable the competent authority to undertake an appropriate level of assessment under the Habitat Regulations.
The residual impacts will be presented to make it clear to the decision maker and stakeholders the significance of the impacts predicted from the developments on the nature conservation interests.

**Studies, Methods and Assessment**

The impact assessment will assess the significance of impacts, positive or negative on the nature conservation interests of the Cable Route, Converter Station site and surrounding area. Mitigation measures will be presented to minimise any adverse impacts; and any opportunities to enhance the nature conservation interest of the site will also be developed. The assessment will be informed by a combination of desk based assessment and field based surveys, with consultation to be held with relevant statutory and non-statutory organisations to gather baseline data.

**Desk Based Assessment**

A desk study and consultation with appropriate organisations and groups will be undertaken to obtain further information on sites of nature conservation interest and habitats and species of note, including protected species within the site area and immediate surrounds.

Relevant publications will be reviewed, including any previous surveys of the area, the Moray Council Biodiversity Action Plan (BAP) to identify key habitats and species found in the local area, and the main objectives for protection and enhancement of these features.

**Surveys**

An Extended Phase 1 Habitat Survey will be undertaken in May 2011 to identify the habitats and assess habitats for suitability for protected species within the proposed Cable Route and Converter Station site, and within a 100 m buffer area. If further surveys for protected species are warranted, the approach to these investigations will be developed in consultation with SNH.

Based on our current understanding of the site it is anticipated that the following ecological surveys will be necessary to inform the EIA:

- extended Phase 1 Habitat Survey;
- otter and water vole survey;
- bat roost assessment, followed by an emergence and re-entry survey where required;
- red squirrel habitat suitability survey within in all woodland habitat within the study corridor, and within the vicinity;
- freshwater pearl mussel habitat suitability survey of all water courses crossed by the cable route;
- reptile habitat suitability survey; and
Proposed Scope of the EIA

- badger survey.

In addition, initial consultation with SNH was undertaken in February 2011 to agree the scope of the ecological surveys. This included discussions on breeding and wintering bird interest in the area and survey approach for the ES. Wintering bird surveys were scoped out of this stage of the assessment, as although it was agree that wintering birds are likely to use the study area, and habitat within the vicinity, it was considered that impacts from the project proposals would be limited to temporary displacement during the works, and therefore that wintering bird surveys would not be required. For breeding birds, consultation with SNH confirmed that the following approach to breeding bird surveys would be appropriate to adequately assess the impacts on breeding birds during the project works:

- data search to determine records of bird species within the survey area;
- use of the Census (CBC) technique to carry out 4 survey visits (rather than the 6 survey visits described in the survey guidelines)

This approach to breeding bird surveys has been considered adequate by SNH, given the nature the project, being of low impact and only a temporary disturbance. The level of survey effort will however, allow territory mapping work to be undertaken to allow a full assessment to be produced in the ES.

4.4 Human Environment

4.4.1 Landscape and Visual

It will be important that impacts from the development upon landscape resources, character and visual amenity of the site and its surroundings are appropriately considered and assessed in the EIA. Guidance and policies which will be considered during the assessment include, but are not limited to, the following:

- Landscape Institute (LI) and the Institute for Environmental Management and Assessment (IEMA) (2002) Guidelines for Landscape and Visual Impact Assessment(1);
- Countryside Agency and SNH (2002) Landscape Character Assessment: Guidance for England and Scotland(2);

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Proposed Scope of the EIA

- The Holford Rules- Guidelines for the routing of New High Voltage Overhead Transmission Lines with NC 1092 and SHETL 2003; and

Baseline

Moray is a largely rural county with a diverse landscape that extends from the Moray Firth coastline in the north, through rural coastal and upland farmland, and forestry to the more mountainous scenery on the edge of the Cairngorms National Park in the south. The Moray Firth and in particular the Spey Bay area, is one of the most important places in the UK for observing dolphins and whales(1). Many of the coastal villages have a rugged and picturesque character whilst further inland the county has a wealth of historic sites and settlements, walking routes, forests, and whisky distilleries with much of the landscape typical of Highland Scotland and its culture.

From the coastline at Porttannachy (west of Portgordon) the beach front is narrow and rocky, but generally low lying with no cliffs. A narrow strip of pasture land extends south of this before the coastal area is enclosed by a steep vegetated cliff or raised beach formation. To the south, the land is generally flatter and gently undulating, forming an area of fertile coastal farmlands that are bounded to the south by higher, forested coastal hills and upland from which a series of burns and upland gulleys cut through the landscape to the coast. The forested hills include the large areas of Aultmore Forest and Corsekell Moss at Millstone Hill and Whiteash Hill Wood, extending into the wider area of Wood of Ordiquish, further to the southwest. Corsekell Moss and Whiteash Hill Wood form a water shed at the saddle between them close to Croft of Ryeriggs (223 m AOD) and south of this point the land falls steadily into the River Isla valley.

South of this landscape the River Isla valley and the settlement of Keith sit in a ‘bowl’ enclosed by the higher ground to the north and other forested hills including to the west at Hill of Mulderie; to the south at Hill of Towie and Cairds Wood and to the east Meikle Balloch. Once past the relatively lower lying farmland to the west of Keith, the route corridor climbs uphill to the existing substation at Blackhillock which sits on a lower shoulder of Cairds Wood further to the south.

(1) Dolphin Watching along the Moray Firth – A Practical Guide
Proposed Scope of the EIA

Designations

The study corridor is located entirely within the area administered by The Moray Council. There are no local landscape designations such as Areas of Great Landscape Value, or Historic Gardens and Designed Landscapes within the study area. The Moray Development Plan contains a number of policies which seek to protect landscape resources, although only the Coastal Protection Zone (CPZ) designation is located within the study area covering the northern portion of the underground cable route, as shown on Figure 4.5.
Legend
- Onshore Cable Route Study Area
- National Grid Connection

Landscape Character Assessment
- Coastal Farmland
- Coastal
- Coastal Lowlands
- Agricultural Heartland
- River Valleys
- Straths and Valleys
- Farmed Moorland Edge
- Uplands

Figure 4.5
Landscape Designations and Character Assessment Types
Onshore Cable Scoping Study

Beatrice Offshore Wind Farm

0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10 10.5 11 11.5 12 12.5 13 13.5 14 14.5 15 15.5 16 16.5 17 17.5 18 18.5 19 19.5 20 20.5
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10 10.5 11 11.5 12 12.5 13 13.5 14 14.5 15 15.5 16 16.5 17 17.5 18 18.5 19 19.5 20 20.5

Blackhillock

OSGB
Transverse Mercator

North
The town of Keith has Conservation Area status.

**Potential Impacts**

Potential impacts on the physical environment are likely to be principally related to the construction stage of the cable laying and construction and operational phases of the convertor station.

**Studies, Methods and Assessment**

The methodology is applicable to the assessment of short term impacts during the construction and to long-term impacts during its operation and during its future decommissioning.

A clear distinction is drawn between impacts on landscape resources and character, and visual impacts.

- Landscape impacts relate to the effects of the proposals on the physical and other characteristics of the landscape and its resulting character and quality. Landscape resources and character are considered to be of importance in their own right and are valued for their intrinsic qualities regardless of whether they are seen by people.

- Visual impacts relate to the effects on the visual amenity and views experienced by people, e.g. residents, workers and tourists on land from key viewpoints throughout the study area. Effects on visual amenity as perceived by people are therefore clearly distinguished from, though closely linked to effects on landscape/resources and character.

**Cable Route**

For the cable route and direct landscape impacts, the study corridor will be restricted to a distance of 50 m either side of the centre line of the cable route (assumed underground cable). This will enable the assessment of landscape impacts arising from direct loss of landscape elements such as woodland, trees and hedgerows. It may also include other landscape features such as stone walls or water courses. These are likely to arise during construction activities and may result in a longer term residual impact.

Indirect impacts may arise from the installation of the cable route on sensitive visual receptors and landscape character areas at larger distances. However, significant indirect impacts are more likely to arise from the construction and decommissioning activities during the installation and removal of the cable. It is considered that there will be no significant impacts arising from the operational stage of the cable route and this should be scoped out of the EIA.
Proposed Scope of the EIA

Key receptors including viewpoints will be identified along the route in association with The Moray Council, SNH and Historic Scotland. They are likely to include: properties, recreational walkways/footpaths, visitor attractions and roads (shown on Figure 4.6).

Substation

The study area will be confined to a 5 km radius from the outer edge of the proposed Substation. This reflects the relative heights of the structures and the likely extent of significant impacts, based on an initial site visit in February 2011. Significant impacts are likely to be confined to nearby sensitive receptors rather than those over 5km distance from the Substation. Within this area a review of maps and development plans will be undertaken to identify relevant policies and designations and to identify key viewpoint locations for illustration.

Computer generated Zone of Theoretical Visibility (ZTV) maps, wireframes and photomontages will be generated using a 3D model of the proposed convertor station and digital terrain models and presented on a 1:50,000 raster data map. All ZVIs will be clipped (or limited) to a 5 km radius from the Substation, reflecting the limits of visibility in this area and the extent of the study area.
The assessment of landscape and visual impacts is based on three stages:

- classification of the sensitivity of the landscape or visual receptors to the type of development proposed;

- prediction of the magnitude of change in the landscape or the view of the site resulting from the development, taking on board embedded and committed mitigation; and

- evaluation of the significance of residual landscape and visual impacts depending on the sensitivity of the landscape or viewer to change and the magnitude of change.

There is a close correlation between the landscape and visual assessment and the assessment of cultural and heritage assets. The landscape and visual impact assessment chapter will assist with the assessment of indirect effects on the settings of SAMs, Listed Buildings and Conservation Areas within the study area. This will include both the cable route and the convertor station.

**4.4.2 Archaeology and Cultural Heritage**

*Introduction*

The main legislation, guidance and policy which will be referred to during the archaeology and cultural heritage assessment for the EIA includes, but is not limited to, the following.

- Scottish Planning Policy.

*Baseline*

As shown in *Figure 4.7* a number of cultural heritage designations such as Listed Buildings, and Conservation Areas are within close proximity of the proposed development and this study will produce an Archaeological Desk Based Survey.

Further field evaluation may be deemed necessary to clarify the presence/absence of archaeological remains on the site and their state of preservation. The necessity of these further studies will be decided based on the results of the Archaeological Desk Based Survey.
Potential Impacts

Significance of impacts will be judged by taking into account their direct effect, the sensitivity of the receptor and whether they are temporary or permanent.

As discussed in Section 4.5 there is a close correlation between the landscape and townscape assessment and the assessment of cultural and heritage features. The landscape and visual impact assessment chapter will assess the indirect effects on the settings of SAMs, Listed Buildings and Conservation Areas.

Studies, Methods and Assessment

The assessment will consider the impact of the proposed development on cultural heritage receptors within and around the site. The assessment will be undertaken in accordance with legislation, guidance and best practice concerned with the protection of features of cultural and/or historic importance.

It is proposed that the study area will consist of two parts; on site (Cable Route and Converter Station); and a wider study area from the centre of the Converter Station site. The extent of the wider study area will be agreed with The Moray Council.

The impact of the development on the archaeological resource will be assessed with reference to the existing baseline and the conclusions which are reached in the desk based survey.

There are no published ‘standard’ criteria for determining the significance of effects on archaeological features. The significance of potential effects will therefore be determined using criteria developed from best practice techniques and expert knowledge in accordance with relevant legislation and guidance. Significance will be determined from a consideration of the importance of the archaeological resource/potential and the degree of impact upon it.
4.4.3 Traffic and Access

Traffic impacts are only likely to occur during the construction phases of the project as during operation the number of traffic movements to the substation will be low, typically around 2 to 3 movements (i.e. 4 to 6 return trips) a month, to allow routine operational access. The EIA will therefore focus on the temporary construction phase and will assess the environmental effects and impacts associated with construction traffic and also any impact the construction movements may have on safety and road capacity.

Baseline

Vehicular access to the site for regular construction and maintenance purposes will be agreed with suitable landowners during the design process. The origin of these trips cannot be determined at this stage so the assessment will be based on baseline data relating to these key identified routes only.

It is proposed that traffic count information will be gathered for the A96 and the B9016 as these roads are most likely to be affected by the construction traffic.

With respect to construction movements, the exact types and numbers of traffic cannot be predicted at this stage, however, construction plant is likely to include:

- cars to transport site staff to and from the site;
- vans making deliveries to the site compound;
- HGVs to deliver materials and components; and
- site plant including excavators, bulldozers, and dump trucks.

The EIA will assess the environmental impacts in terms of predicted additional vehicle movements generated during the construction phase of the development compared with existing conditions. The assessment methodology is identified below.

Potential Impacts

The assessment will therefore consider the issues highlighted in the guidance, taking into consideration the local conditions, the nature and capacity of the road network, existing flows and their composition and the surrounding land uses when determining the likely magnitude of traffic impacts. Where relevant, these traffic related impacts (such as noise) will be addressed separately in other chapters of the ES.

Consideration will also be given to the impacts of changes in traffic resulting from construction on other road users (e.g. cyclists and pedestrians) and people living and working close to the roads.
Once operational the number of traffic movements will be relatively low to allow routine maintenance works. Occasional abnormal loads may be required; however, it is considered that impacts from these operational movements will not be significant.

**Studies, Method and Assessment**

There is no established guidance on the assessment of traffic and transport impacts associated specifically with temporary construction activities. The assessment thresholds set out in Government guidance by the Department for Transport (DfT)/Department of Communities and Local Government (DCLG) (2007)(1) and the Institute of Environmental Assessment (IEA) (1993)(2) focus principally on long-term, operational traffic.

This guidance does, however, note that potential transport impacts from construction should be taken into account in assessing the impacts of a new development. In line with advice in the guidance, the assessment will set out the time period(s) during which construction activities will take place, the number of trips likely to be generated, the vehicle type and, for heavy construction traffic, an appropriate diversion route or a traffic management plan to minimise local impacts.

The assessment will consider the level and nature of generated construction and provide a view as to the potential for significant transport impacts based on professional judgement. This will take into account factors such as the nature/type of roads which will be used, existing traffic flows and their composition, surrounding land uses and committed mitigation.

Once these baseline parameters are established the predicted levels of construction traffic must be determined. Factors that must be established include:

- the routes construction traffic will take to site;
- the frequency and composition of construction traffic;
- capacity of the existing network to cater for this composition; and
- construction timetable and phases.

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(1) Department for Transport (DfT)/Department of Communities and Local Government (DCLG) (March 2007) Guidance on Transport Assessments TSO
(2) Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic, Guidance Notes No 1, IEA
4.4.4 Noise and Vibration

Noise and Vibration impacts are likely to occur during the construction and operational phases of the project. The EIA will therefore focus on the temporary construction phase but will also assess the environmental impacts associated with operation of the substation.

Baseline

The study corridor, shown in Figure 2.1, shows that mostly agricultural land will be affected, where ambient noise levels are relatively low, generated mostly by traffic along neighbouring roads (such as the A96 and the B9016), and typical of remote/rural areas.

Based on previous assessments it is understood that the baseline noise levels are influenced by existing electricity infrastructure and traffic noise and these may change with the increase of infrastructure during the operation of the substation.

Studies, Methods and Assessment

Due to the scale and nature of development it is considered that noise monitoring along the cable route will not be required, as many of the construction noise impacts will be transient, temporary at each location. It is proposed that control of construction noise and vibration can be best achieved through control of working hours and by following suitable best practice.

A desk based assessment of the impacts of predicted construction noise associated with the development of the substation will be undertaken. The findings of this assessment will inform the production on any mitigation and monitoring where it is considered to be required.

Air Quality

It is proposed that air quality be scoped out of the assessment as this is not likely to result in a significant impact due to the nature of the proposals.
Proposed Scope of the EIA
5 CUMULATIVE IMPACT ASSESSMENT

The onshore and offshore cable works are considered a contiguous part of the wider offshore wind farm project being progressed by BOWL. As such the cable elements and the Beatrice Offshore Wind Farm elements will be considered in their entirety as ‘the project’. All cumulative impacts associated with the main project components (onshore infrastructure, marine cable and wind farm) will be assessed in the overarching project ES to be prepared by BOWL. The cumulative impacts of additional onshore and offshore developments will also be included, such as SHETL cable, MORL and other onshore wind farms within the vicinity of the project.

It is recognised by BOWL that the development of offshore wind farms within Scottish waters is of an unprecedented scale and the potential for cumulative impacts on environmental features has become one of the most important aspects of the consenting process for offshore wind development. In recognition of this, the Moray Firth Offshore Wind Developers Group (MFOWDG) was formed by Beatrice Offshore WindFarm Limited (BOWL) and Moray Offshore Renewables Limited (MORL), in partnership with The Crown Estate, to work collaboratively on potential regional cumulative impacts arising from their proposed offshore wind development.

The MFOWDG has recently issued a Cumulative Impacts Discussion Document (April 2011) to instigate discussion with key stakeholders and interested parties. These discussions are focussing around the approaches and methodologies to be adopted in the cumulative impact assessment exercises. The purpose of the document issued in April is:

- to present the approach and methodology proposed by MFOWDG for the collection of data to be used in the cumulative impact assessment;
- to present an approach and methodology to the assessment of cumulative impacts, for use by both MFOWDG developers as part of individual EIAs; and
- to invite comment from statutory and other key consultees and seek agreement of the approaches proposed by MFOWDG.

It should be noted therefore that a separate exercise is currently ongoing in relation to the cumulative impact assessment exercise relating to the Beatrice Offshore Wind Farm.

A cumulative and in combination impact assessment is also a requirement of the Habitats Regulations(1) with respect to the designated SACs and SPAs which may be affected. As a result, the

(1) The Conservation (Natural Habitats, &c ) Regulations 1994 (OPSI)
cumulative and in combination assessment of impacts on the marine mammals and seabirds of the Moray Firth’s European designated sites will be an important consideration within the EIA process.
Proposed Scope of the EIA

6 STRUCTURE OF THE ENVIRONMENTAL STATEMENT

The structure proposed for the ES is in line with Schedule 4 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and relevant good practice guidance including those listed below.

- Preparation of Environmental Statements for Planning Projects that require Environmental Assessment.

The overall ES will comprise three main parts.

- A non-technical summary.
- The main text (split into a wind farm, marine cable and terrestrial cable and convertor station section).
- Supporting technical appendices.

The introductory chapters will contain background information on the project, set out the EIA methodology and planning policy. The remaining chapters will contain technical assessments of the potential environmental effects and mitigation measures proposed and/or adopted during the project design to avoid or reduce such effects.

Based on the content of this Scoping Report the following topics are proposed to be assessed in detail during the EIA and reported in the ES for the cable route and substation.
**Proposed Scope of the EIA**

**Offshore Cable**

Physical Environment
1. Coastal Processes

Biological Environment
2. Underwater Noise
3. Seabed Marine Life
4. Fish Ecology
5. Marine Mammals

Human Environment
6. Archaeology and Cultural Heritage
7. Ministry of Defence (consultation)
8. Shipping and Navigation
9. Commercial Fisheries
10. Salmon and Sea Trout Fisheries
11. Offshore Oil and Gas

Onshore cable route and substation
12. Geology, Soils and Waste
13. Water Environment
15. Landscape and Visual
16. Historic Environment
17. Traffic and Access
18. Noise and Vibration

**Topics to be scoped out**

Based on existing knowledge, data and understanding it is proposed that the following topics be scoped out of the EIA.

**Offshore Cable**

Physical Environment
19. Landscape, Seascape and Visual (offshore)
20. Geology (Offshore)
Proposed Scope of the EIA

Biological Environment
21. Plankton
22. Ornithology (offshore)
23. Offshore Airborne Noise

Human Environment
24. Existing and Proposed Pipelines and Cables (excluding oil and gas)
25. Marine Waste and Disposal
26. Civil Aviation

Onshore Cable Route and Substation
27. Air Quality
28. Socio Economics
7 CONSULTATION

7.1 INTRODUCTION

BOWL proposes to undertake its consultation and communication exercises with reference to best practice(1) and all applicable legal requirements. BOWL recognises the importance of consultation during all phases of the project with the regulators, and other stakeholders, including local communities. As well as the EIA scoping exercise and specific EIA consultations, BOWL will implement a wider stakeholder communication process to engage with and inform stakeholders on project’s development. This wider communication exercise will be informed by a Stakeholder Engagement Plan.

7.2 EIA CONSULTATION

This Scoping Report aims to introduce the Beatrice Cable Route and Converter Station proposals, to set out the approach to the EIA and the associated data gathering exercise and to present what is considered by BOWL to be the main issues and topics to be addressed in the EIA. One of the main aims of the scoping exercise is to consult with a variety of stakeholders to agree the scope, methodologies, surveys, assessments and outputs of the EIA. For this purpose this Scoping Report has been issued to with the bodies identified in Table 7.1 below which also identifies the key areas that these stakeholders are being consulted on. It is expected that as consultations progress BOWL will be informed of other appropriate stakeholders that may be consulted.

Table 7.1 List of Scoping Report Consultees

<table>
<thead>
<tr>
<th>Consultees</th>
<th>Key areas of EIA consultation</th>
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<tbody>
<tr>
<td>Scottish Government Energy Division</td>
<td>All elements of the EIA</td>
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<tr>
<td>The Crown Estate</td>
<td>All elements of the EIA</td>
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<td>Marine Scotland</td>
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<td>Highland Council</td>
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<td>Moray Council</td>
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<td>Moray Firth Partnership (and SAC Group)</td>
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<td>Network Rail</td>
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<td>Local Community Councils</td>
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<td>Design and technology</td>
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<tr>
<td>Department of Energy and Climate Change (Aberdeen)</td>
<td>Design and technology</td>
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Proposed Scope of the EIA

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<th>Consultees</th>
<th>Key areas of EIA consultation</th>
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<td>Aviation, military operation constraints</td>
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</table>

This list is not exhaustive and further consultees may be identified and consulted during the Scoping and EIA exercises.

Scoping consultations have already commenced with various bodies and organisations in the table above. Once all parties are engaged in the Scoping exercise BOWL and its specialist advisors will refine and agree the scopes, timetables and deliverables required to inform the EIA. These consultations will continue through the EIA exercise up until submission in December 2011.

As discussed in Section 5 it is recognised that a collaborative approach to consultation will be adopted in relation to cumulative impacts associated with the MORL Wind Farm and Transmission Works.
7.2.1 Stakeholder Engagement Plan

Our Stakeholder Engagement Plan (SEP) sets out the engagement strategy and communications protocol for BOWL that will be used to engage with key stakeholders and support the project through its development, construction and operation phases.

The SEP will cover engagement with both statutory and non-statutory stakeholders. Engagement with the public, community bodies, elected representatives and the media will be co-ordinated by BOWL and all statutory and remaining non-statutory bodies will be engaged with by the wider project team.

Engagement with stakeholders is being undertaken using a variety of the following methods:

- Letters and emails;
- Phone calls;
- Meetings;
- Web-page;
- Public exhibitions/roadshows;
- Posters; and
- Press releases and adverts/notices.

7.2.2 Get in Touch

Whether formal or informal, your views and opinions about the proposed Transmission Works, even at this early stage are welcome and valued. If you have any comments, queries or views about the contents of this Scoping Report please feel free to contact ERM by the methods below. Your Opinion on the Scoping Report may be sought directly by the Scottish Government.

In writing to:

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Environmental Resources Management
Norloch House
36 King’s Stables Road
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EH1 2EU

By Email to: colin.maciver@erm.com

Digital copies of this Scoping Report are available from the project website at: www.sse-beatrice.com