FORTHWIND DEMONSTRATION PROJECT

DECOMMISSIONING PLAN

FW1.PLN.0003

Confidentiality Status: For Public Consultation

<table>
<thead>
<tr>
<th>SIGNATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
</tr>
<tr>
<td>Rev</td>
</tr>
</tbody>
</table>
# Table of Contents

1. Introduction ................................................................................................................. 4

2. Executive Summary ........................................................................................................ 5

3. Background Information ................................................................................................. 6

   3.1. Layout of the Facilities to be Decommissioned .......................................................... 6

   3.2. The Site Location and Adjacent Facilities .................................................................... 7

       3.2.1. Fife Energy Park .................................................................................................. 7

       3.2.2. ORE Catapult Levenmouth Turbine ..................................................................... 7

       3.2.3. Oil and Gas Infrastructure .................................................................................... 7

       3.2.4. Cables and Pipelines ............................................................................................ 8

   3.3. Local Marine Activity .................................................................................................. 8

       3.3.1. Methil Port .......................................................................................................... 8

       3.3.2. Anchorages ......................................................................................................... 8

       3.3.3. Pilot Boarding Position ....................................................................................... 9

   3.4. Site Environmental Conditions .................................................................................... 9

       3.4.1. Tidal Regime ....................................................................................................... 10

       3.4.2. Wave Regime ..................................................................................................... 10

       3.4.3. Currents .............................................................................................................. 11

   3.5. Proximity to Environmental Protected Areas ............................................................. 11

   3.6. Description of the items to be decommissioned ........................................................... 15

       3.6.1. Overview ............................................................................................................. 15

       3.6.2. Rotor ................................................................................................................... 17

           3.6.2.1. Blades ......................................................................................................... 17

           3.6.2.2. Hub .............................................................................................................. 17

           3.6.2.3. Spinner ..................................................................................................... 17

           3.6.2.4. Blade Pitch System .................................................................................... 17
4.3. Nacelle .......................................................................................................................... 17
4.3.1. Main Frame .............................................................................................................. 18
4.3.2. Nacelle Cover ......................................................................................................... 18
4.3.3. Electrical Systems ................................................................................................. 18
4.3.4. Mechanical Systems ............................................................................................. 18
4.3.5. Cranes ..................................................................................................................... 18
4.3.6. Helideck / Hoisting Platform ............................................................................... 18
4.4. The Structure ............................................................................................................. 19
4.5. Pin Pile Foundation .................................................................................................... 19
4.6. Electricity Export Cables .......................................................................................... 19
5. Description of Proposed Decommissioning Measures .................................................. 20
  5.1. Proposed Method of Removal .................................................................................. 20
    5.1.1. Preparatory Stages ............................................................................................. 20
    5.1.2. Removal of the Turbine Rotor and Nacelle ....................................................... 21
    5.1.3. Removal of the Turbine Structure .................................................................... 21
    5.1.4. Electrical and Communication Cabling ............................................................. 21
    5.1.5. Ancillary equipment and Post Decommissioning Surveys ................................ 22
    5.2. Waste Management .............................................................................................. 22
    5.3. Predicted Degradation, Movement and Stability of any Remains ....................... 23
    5.4. Alternative to Decommissioning after 20 years .................................................... 23
6. Environmental Impact Assessment ............................................................................. 24
7. Consultations with interested parties .......................................................................... 24
8. Costs .............................................................................................................................. 24
10. Schedule ...................................................................................................................... 25
11. Project Management and Verification ....................................................................... 25
12. Seabed Clearance ....................................................................................................... 25
13. Restoration of the Site ................................................................................................ 25
14. Post-Decommissioning Monitoring, Maintenance and Management of the Site ....... 25
15. Supporting Studies ...................................................................................................... 26
16. References .................................................................................................................. 26
Annex 1 – Preliminary Design of the Forthwind Structure ............................................. 27
1. INTRODUCTION

Forthwind Ltd was granted consent on the 21 December 2016 by the Scottish Ministers under section 36 of the Electricity Act 1989 for the construction and operation of an offshore generating station (the Forthwind Offshore Wind Demonstration Project) approximately 1.5km offshore from Methil in the Firth of Forth. The consent also included a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended) that planning permission for the ancillary onshore development be deemed to be granted.

In addition, a Marine Licence (ref 05632/17/2) for marine renewables construction, operation and deposit of substances or objects in the Scottish Marine Area was issued by Marine Scotland under the Marine (Scotland) Act 2010, Part 4 Marine Licensing to Forthwind on 12 September 2017.

Sections 105 – 114 of the Energy Act 2004 introduces a decommissioning scheme for offshore wind, wave and tidal energy installations. Under the terms of the Act, the Scottish Ministers may require a person responsible for one of these installations to submit (and eventually carry out) a decommissioning programme for the installation. On the 2 June 2017, the Marine Scotland Licensing Operations Team (MSLOT) issued a notice to Forthwind Ltd under Section 105(7) of the Energy Act to submit to Scottish Ministers with a programme for decommissioning the Forthwind installation.

![Figure 1 - The Forthwind Offshore Wind Demonstration Project Location](image)

The Forthwind Demonstration Project, due to commence installation in Quarter 2, 2019 includes:

- 2 Offshore Wind Demonstration Turbines of the 2B Energy 2B6 design;
- 1 pile for each leg of each turbine (i.e. 3 piles per turbine; 6 piles in total for the project)
- 1 electricity export cable per turbine rated at 10kV (i.e. 2 export cables in total for the project).
• 1 onshore transformer station, located within the Fife Energy Park; and
• 1 onshore electrical substation, located within the Fife Energy Park.

This document outlines Forthwind Limited’s programme for the decommissioning of the Forthwind Offshore Wind Demonstration Project.

Please be advised that this Decommissioning Programme (DP) is a draft programme for consultation and will be updated to take account of any comments and/or information gained during the 30 day consultation period (from 06 November to 06 December 2017). The DP will then be formally submitted to the Marine Scotland Licensing Operations team for approval by Scottish Ministers.

2. EXECUTIVE SUMMARY

Forthwind Ltd, a wholly owned subsidiary of 2B Energy, received consent to develop the Forthwind Demonstrations Project on the 21 December 2016. 2B Energy is an offshore wind technology development company which has its origin in deliverability issues and the lack of adapted technologies for conventional offshore wind power plants. 2B Energy has developed a specialised offshore wind turbine based on a downwind, 2 blade rotor design concept which allows the introduction of a number of innovations which contribute to a significantly lower levelized cost of energy (LCOE) than is achievable with the current standard 3 bladed upwind offshore wind technology.

The offshore element of the Forthwind Offshore Wind Demonstration project is made up of two individual “2B6” design turbines which feature two blades with a 142m rotor diameter and a self-aligning ‘soft yaw’ system. The turbines are supported on a 3 “legged” lattice-type welded truss tower which extends from the nacelle to the seabed and secured by a foundation pile on each leg. The operational design life of the 2B6 turbines, support structure and foundation piles will be 20 years.

The installation of the foundation piles is scheduled to commence in April 2019, with the installation of the turbine (including the support structure and associated infrastructure) due to be undertaken in Quarter 2, 2019. The decommissioning process of the Forthwind Offshore Wind Demonstration Project is essentially the reverse to the installation process and is described in detail within this document; however, in summary the process will be:

• Commence with mobilisation of the decommissioning vessels to the site;
• The ancillary infrastructure (i.e. the electrical and communication lines) will be disconnected from the turbine and left on the seabed for later recovery as part of the decommissioning activity.
• The turbine nacelle and blades will be disconnected and removed from the top of the structure in one lift and placed onto the service vessel or barge. The remaining sections of the structure will be unbolted and lifted in sequence onto the service vessel or barge.
• To remove the bottom section of the structure, the 3 foundation piles will be cut flush with the seabed.
• All electrical and communication cabling will be recovered using vessel based buoyancy modules and transported back to shore for recycling or scrapping at an appropriate facility.
• It is intended that the cabling infrastructure beneath the seabed will be left in situ, if it can be demonstrated at the time that it does not pose an unacceptable environmental risk or safety risk to local fishing or amenity activities. However, financial provision will be made to remove this infrastructure and the requirement to decommission will be re-evaluated nearer the time.
• Any waste produced during decommissioning operations will be removed from site on board the service vessel.

• A post decommissioning seabed survey will be carried out and a decommissioning report provided to Marine Scotland.

3. BACKGROUND INFORMATION

3.1. Layout of the Facilities to be Decommissioned

The Forthwind Demonstration Site is located on the northern shore of the Firth of Forth at Methil, Scotland and is approximately 1.5 km from the mean high water springs (MHWS). A 100m micro siting allowance from these centre points for the turbines and associated infrastructure is required prior to the deployment of the turbine at their locations. Final location co-ordinates will be given following the pile installation, where each pile location will be given (3 per turbine).

![Figure 2 - Forthwind Project Location](image)

Each turbine will have its own dedicated electricity export cable rated at 11kV which will feed from the turbines to the onshore transformer station located on the Fife Energy Park

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Turbine FWA1</th>
<th>Turbine FWB1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Grid reference (NGR) at centre point</td>
<td>336964, 696677</td>
<td>337812, 697333</td>
</tr>
<tr>
<td>2</td>
<td>Latitude / Longitude (WGS84) at centre point</td>
<td>56°09′30.90″N 003°00′59.22″W</td>
<td>56°09′52.52″N 003°00′10.63″W</td>
</tr>
<tr>
<td>3</td>
<td>Export Cable Length (from turbine centre point to Mean Low Water Springs)</td>
<td>1459m</td>
<td>1846m</td>
</tr>
</tbody>
</table>
Table 2- Forthwind Turbine Technical Parameters

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Height to blade tip (above Lowest Astronomical Tide) to the highest point</td>
<td>173</td>
<td>m</td>
</tr>
<tr>
<td>2</td>
<td>Height to hub (LAT to the centreline of the generator shaft)</td>
<td>102</td>
<td>m</td>
</tr>
<tr>
<td>3</td>
<td>Rotor diameter</td>
<td>142</td>
<td>m</td>
</tr>
<tr>
<td>4</td>
<td>Maximum rotation speed of rotor</td>
<td>13.33</td>
<td>rpm</td>
</tr>
<tr>
<td>5</td>
<td>Generation Capacity of each turbine</td>
<td>6</td>
<td>MW</td>
</tr>
<tr>
<td>6</td>
<td>Generating capacity of the site overall</td>
<td>12</td>
<td>MW</td>
</tr>
<tr>
<td>7</td>
<td>Distance between each turbine centre points</td>
<td>1072</td>
<td>m</td>
</tr>
<tr>
<td>8</td>
<td>Turbine Foundation Solution</td>
<td>Pin Pile</td>
<td></td>
</tr>
</tbody>
</table>

3.2. The Site Location and Adjacent Facilities

The project is located off the “coal coast” of Fife, which has an industrial history associated with large coastal structures, dating back to coal hoists used at Methil docks in the late c19th (used to lift coal mining locally onto ships). The former Methil Power Station (a coal slurry-fired power station) formed a local landmark since the 1960’s until it was demolished in 2011.

The stretch of coastline extending from Buckhaven to Methil is defended by a rock armour revetment, except for a sheet pile quay at the shorefront of the Fife Energy Park. Further west, between East Wemyss and Buckhaven, the coastline is formed by a soil and vegetation embankment. To the northeast there are the docks of Methil and a concrete seawall that extends up to Leven.

3.2.1. Fife Energy Park

The Fife Energy Park is an area of industrial development and reclaimed land with an abrupt seaward boundary with the shingle beach having been removed and replaced with a quayside against which barges, and other vessels are often moored. Oil rig sheds and yards are now used for the fabrication of renewable energy structures, such as jackets for offshore wind turbines. There are existing large-scale wind turbines at Methil Docks and the Levenmouth Demonstration Turbine (LDT) on the coast.

3.2.2. ORE Catapult Levenmouth Turbine

The Offshore Renewable Energy (ORE) Catapult LDT is situated just outside and to the south west of the offshore Energy Park area within 20m of the shore. It constitutes no significant hazard to navigation.

3.2.3. Oil and Gas Infrastructure

Within the Firth of Forth harbour limits are two marine terminals for oil and gas export. The port of Grangemouth is home to the Grangemouth refinery oil storage and tanker terminals and the Hound Point marine tanker loading terminal. No fixed oil and gas infrastructure has been identified near the site.
3.2.4. **Cables and Pipelines**

A review of charted subsea cables in the Firth of Forth (Kingfisher Information Service-Cable Awareness (KIS-ORCA – Seafish, 2017) indicates that there are no subsea telecommunication or power cables near the site.

A National Grid high pressure gas network pipeline lies to the east of the development site, entering the Firth of Forth on the east side of Largo Bay across the Firth and landing to the east of Gullane. An exclusion zone around the pipeline is marked on the nautical navigation chart (to the east of the Methil anchorage points).

3.3. **Local Marine Activity**

3.3.1. **Methil Port**

Methil Port is a small commercial port handling wood pulp and timber, aggregate and general bulk cargo. The harbour is administered by Forth Ports. The port has the facilities to accommodate the repair, maintenance and supply of offshore drilling rigs and tankers. These take advantage of the deep, sheltered water of Largo Bay and the specialist services in Methil and its locality. The port can accommodate vessels up to 102m Length Overall (LOA), 14.5m beam, 5.5m draught and 3,000 dead weight tonnage.

![Nautical Navigation Chart at the Forthwind Development Site](image)

3.3.2. **Anchorages**

Five anchorage berths numbered M1 through M5 are situated south east of Methil whilst nine anchor berths (K1 to K9) are off Kirkcaldy but are directly adjacent to the proposed development area. All these anchorages are allocated by the Forth and Tay Navigation Service. The swinging circle of 750
metres radius around the anchor position shows the maximum allowed extent of the vessel position when at the full scope of its anchor or mooring chain and is indicated on the chart. There is also an anchorage for small vessels closer inshore which is indicated by appropriate symbology.

3.3.3. **Pilot Boarding Position**

When entering Methil Port, vessels will embark a pilot at the position indicated on the chart approximately 1500m south of the dock entrance and 600m north east of the northernmost proposed turbine position.

3.3.4. **Commercial Shipping**

Forth Ports exercises jurisdiction over all the waters of the Firth of Forth (including the site area). The Firth of Forth accounted for Scotland’s highest freight traffic movements in 2015 (27 million tonnes), although this volume has fluctuated over the previous 10 years (it was 10% lower in 2014 but 36% more in 2005). The principal commodities being transported are oil, petro-chemicals and liquefied gases which pass through the port of Grangemouth and the two marine terminals at Hound Point and Braefoot. The port of Grangemouth also handles considerable volumes of container traffic.

3.3.5. **Offshore Energy Park Fife**

An offshore Energy Park area has been established immediately adjacent to the shore based Energy Park and is indicated on the charts accordingly as well as being marked by buoys. The navigation chart note states that “Mariners should avoid entering this area unless involved in operations”. The area does not encompass the Forthwind development area.

3.3.6. **Fishing Activity**

There are a number of commercial fishing activities in the area including Nephrops trawling, creeling, scalloping and squid trawling take place in, or in close proximity to, the development area at different times of the year. Vessels involved in fishing in the area ranges from 6m (18ft) creelers up to 15m (50ft) scallopers. Fishing vessels in transit up and down the coast and will tend to hug the coast but not infringe on the known creeling areas.

Recreational fishing occurs within the locality but is mainly limited to within the inshore areas and shore fishing.

3.3.7. **Recreational Traffic**

The RYA UK Coastal Atlas shows the entire area of the Firth of Forth as a “General Sailing Area” with a “medium” use coastal; recreational sailing route passing offshore of Methil and south of the proposed development. The Atlas also highlights the small vessel anchorage for use by recreational craft (indicated on the Admiralty charts, just off Methil breakwater). There is no indication of racing activity shown in the area, neither is the port of Methil shown as having an affiliated RYA Club or marina.

3.3.8. **Marine Aggregate Extraction**

Within the Firth of Forth there is one licensed marine aggregate extraction site located within the inner Firth of Forth South West of Methil. It is unclear as to whether this site has been previously utilised. However, evidence from the Department for Business Innovation and Skills, Monthly Statistics of Building Materials and components suggests that no aggregate has been extracted from marine sources in Scotland within recent years.
3.3.9. **Marine Waste Disposal**

There are a number of closed disposal sites located in the Firth of Forth, the closest of which is approximately 10 km from the Development site.

There are 3 open disposal sites located within the wider vicinity of the Development from Inchkeith to Methil. Two of these are approximately 14.9 km (Blae Rock A and B) and 16 km (Narrow Deep B) south west of the Development. The closest open disposal site to the proposed Development area is ‘Methil’ at 0.9 km to the east. However, it is not anticipated that the decommissioning operations will interfere with the open disposal sites.

3.3.10. **Military Activities**

Areas in and around the Firth of Forth are predominantly used by the Navy for submarine exercises, mine countermeasures and minesweeping, and explosive trials. The Firth of Forth at Fife is partially covered by a MOD Safeguarding consultation zone, the Firth of Forth is also partially covered by two airspace restriction zones and numerous naval activity areas. The site falls within an area of naval activity area for general practice, mine countermeasures and of aviation practice/areas of concern. Further consultation with the Defence Infrastructure Organisation (DIO) will be required prior to decommissioning activities taking place.

3.4. **Site Environmental Conditions**

3.4.1. **Tidal Regime**

Published data is available for Methil as it is defined by the UKHO as a Secondary Port (Leith is the nearest Standard Port). The following table summarises the levels of the various tide states at Methil:

<table>
<thead>
<tr>
<th>Tide State</th>
<th>Chart Datum</th>
<th>Ordnance Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest Astronomical Tide (LAT)</td>
<td>- 0.2m</td>
<td>- 3.1m</td>
</tr>
<tr>
<td>Mean Low Water Springs (MLWS)</td>
<td>0.7m</td>
<td>- 2.2m</td>
</tr>
<tr>
<td>Mean Low Water Neaps (MLWN)</td>
<td>1.9m</td>
<td>- 1.0m</td>
</tr>
<tr>
<td>Mean High Water Neaps (MHWN)</td>
<td>4.3m</td>
<td>1.4m</td>
</tr>
<tr>
<td>Mean High Water Springs (MHWS)</td>
<td>5.5m</td>
<td>2.6m</td>
</tr>
<tr>
<td>Highest Astronomical Tide (HAT)</td>
<td>6.1m</td>
<td>3.2m</td>
</tr>
</tbody>
</table>

For clarity, based on the above table a seabed location of -5.5m OD implies that there would be around 3.3m depth of water at MLWS and 8.1m of water at MHWS.

3.4.2. **Wave Regime**

Waves in the Firth of Forth can be classified in two types: wind waves and swell waves. Swell waves are those originated outside the Firth, in the wider North Sea area, which then propagate into the Firth of Forth. Wind waves are locally generated waves due to the action of wind in the estuary.

Due to the orientation of the Firth of Forth, the range of swell waves that can enter the area is limited to those coming from a northeast or east direction. In general terms, their influence on coastal processes is limited in the Firth of Forth compared to that of wind waves, except on the outer estuary and particularly in the stretch of coastline between Burntisland and Leven, more exposed to the east. In the development location, swell waves can reach heights of 1.9 m, rising to 2.5 m in shallow water towards the shoreline.
Wind wave characteristics (height and period) are mostly determined by the available fetch, or the distance over which the wave generating wind is blowing. The largest fetch in the Development area is to the south-southwest (approximately 25 km), and wind waves can reach here maximum heights of 1.2 m, although heights up to 0.5 m are more likely.

3.4.3. **Currents**

Currents in the Firth of Forth are generated due to a mix of tidal and wave influence and density variations, although tide is the main agent.

Tidal flood currents on the north side of the Forth tend to be stronger than flood currents on the southern side, while ebb tides tend to be stronger on the southern side due to bathymetry effects. Along the Kirkcaldy shorefront, near to the Development location, tidal currents flow in a northeast to southwest direction during flood tides, reversing direction after the high water. Peak spring and neap flows in this area are 0.35 ms\(^{-1}\) and 0.20 ms\(^{-1}\) respectively approximately 3 km off the coastline. Tidal current velocities at this location tend to be on average greater on the ebb tide than on the flood tide, although the highest peak velocity occurs during the flood tide. Overall, tide currents result in a general drift to the west along the northern and central areas of the Firth of Forth, and an eastern drift on the south side.

Waves approaching the shoreline at an oblique angle also generate currents. Wave generated currents in the inner Firth of Forth are weak, and become more significant in the outer estuary, where the influence of waves is more pronounced.

3.4.4. **Site Geotechnical Conditions**

Under the supervision of Ramboll (UK) Limited, a site geotechnical investigation was carried out by Fugro GeoServices Limited (FGSL) at the site between 17 April 2017 and 30 April 2017.

Detailed bathymetry of the deployment site for the two turbines and a portion of the export cable route is provided in a report produced by Aspect Surveys. Aspects Surveys carried out the following surveys to inform the report:

- Multibeam Bathymetric (MBES) Survey (August 2014)
- Side-scan Sonar (SSS) Survey (November 2014)
- Magnetometer Survey (November 2014)
- Geophysical Survey (November 2014)

An addition magnetometer survey was carried out Aspect Surveys in August 2016 for the second turbine location (following adjustment of the location). The results of the magnetometer survey are available in a second Aspect Survey report.

3.5. **Proximity to Environmental Protected Areas**

Figure 4 shows the proximity of the environmental protected areas near to the Forthwind Site. The information on the statutory designated sites for ornithological interest was obtained from the Scottish Natural Heritage Information Service (SNHi). The maps include breeding seabird SPAs and marine mammal SACs. For fish/shellfish SACs designated for species with migratory pathways that have the potential to enter within the Development area are also included.

Information about non-statutory designated sites and other sites for bird conservation was obtained where available within a radius of 2 km from the Development site. Non-statutory designated sites and other sites for bird conservation include:
- Local Nature Conservation Sites (LNCS);
- Royal Society for the Protection of Birds (RSPB) reserves; and
- Scottish Wildlife Trust (SWT) reserves.

<table>
<thead>
<tr>
<th>Site Name and Distance from Site</th>
<th>Designation</th>
<th>Site Description</th>
<th>Qualifying Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firth of Forth</td>
<td>SPA, Ramsar, SSSI</td>
<td>The Firth of Forth SPA/Ramsar/SSSI is a complex of estuarine and coastal habitats in south east Scotland stretching east from Alloa to the coasts of Fife and East Lothian. The site includes extensive invertebrate-rich intertidal flats and rocky shores, areas of saltmarsh, lagoons and sand dunes.</td>
<td>The Firth of Forth SPA is classified on account of its wintering bird populations namely: bar-tailed godwit, goldeneye, golden plover, knot, pink-footed goose, redshank, red-throated diver, shelduck, Slavonian grebe, and turnstone. It is also classified for its post breeding sandwich tern population. The Firth of Forth SPA is also classified on account of its wintering waterfowl assemblage which includes nationally important numbers of common scoter, cormorant, curlew, dunlin, eider, goldeneye, great crested grebe, grey plover, long-tailed duck, mallard, lapwing, oystercatcher, redshank, red-breasted merganser, ringed plover, scaup, velvet scoter and wigeon. The Firth of Forth Ramsar is designated on account of its waterbird populations including: bar-tailed godwit, goldeneye, knot, pink-footed goose, redshank, sandwich tern, shelduck, Slavonian grebe and turnstone. It is also designated on account of its waterfowl assemblage. The SSSI is notified for breeding populations of eider, ringed plover and shelduck. It is also notified for wintering populations of bar-tailed godwit, common scoter, cormorant, dunlin, eider, goldeneye, and great crested grebe.</td>
</tr>
</tbody>
</table>
| Outer Firth of Forth and Tay Bay Complex | Proposed (p)SPA | A large marine area covering 312,982.11 ha, associated with the mouths of the Firth of Forth and the Firth of Tay. | Qualifying bird species in the dSPA include:
Breeding: Arctic tern, common tern, gannet, guillemot, herring gull, kittiwake, manx shearwater, puffin and shag.
Non-breeding: Black-headed gull, common gull, common scoter (wintering population of 4,435 birds), eider (wintering population of 21,034 birds), goldeneye (wintering population of 589 birds), guillemot, herring gull, kittiwake, little gull, long-tailed duck (wintering population of 1,881 birds), razorbill, red-breasted merganser (wintering population of 368 birds), red-throated diver (wintering population of 767 birds), shag, |
<table>
<thead>
<tr>
<th>Site Name and Distance from Site</th>
<th>Designation</th>
<th>Site Description</th>
<th>Qualifying Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forth Islands 11.1 km south east of the nearest turbine location.</td>
<td>SPA, SSSI</td>
<td>Forth Islands SPA/SSSI consists of a series of islands supporting the main seabird colonies in the Firth of Forth.</td>
<td>(wintering population of 30 birds) and velvet scoter.</td>
</tr>
<tr>
<td>Cameron Reservoir 16.1 km north east of the nearest turbine location.</td>
<td>SPA, Ramsar, SSSI</td>
<td>Cameron Reservoir SPA/ Ramsar/SSSI is a mesotrophic reservoir with a grassland and willow Salix sp. Carr fringe, covering 64.4 ha in Fife, Scotland.</td>
<td>The SPA, Ramsar and SSSI all qualify on account of the Cameron Reservoir’s wintering pink-footed goose population.</td>
</tr>
<tr>
<td>Loch Leven 17.7 km west of the nearest turbine location.</td>
<td>SPA, Ramsar, SSSI</td>
<td>Loch Leven SPA/Ramsar/SSSI in central Scotland is the largest natural eutrophic lake in Britain. It is a relatively shallow loch, surrounded by farmland, with a diverse aquatic flora and shoreline vegetation. The boundary of the Loch Leven SPA follows that of the Loch Leven SSSI except for the exclusion of 4 ha of SSSI towards the northern end of the loch. It is also a National Nature Reserve (NNR)</td>
<td>Loch Leven SPA is classified on account of its wintering pink-footed goose, shoveler and whooper swan populations. It also qualifies as an SPA on account of its wintering waterbird assemblage which comprises cormorant, gadwall, golden-eye, pochard, teal and tufted duck. Loch Leven is also a Ramsar site on account of its wintering population of pink-footed goose, and for its wintering assemblage of cormorant, gadwall, golden-eye pochard, shoveler, teal and tufted duck. Loch Leven is a SSSI on account of its ornithological, botanical and entomological interest. In terms of birds it was notified due to supporting internationally important numbers of wintering greylag and pink-footed Geese. It also holds nationally important wintering populations of several other species of wildfowl and has exceptionally high breeding duck numbers.</td>
</tr>
<tr>
<td>Imperial Dock Lock 17.9 km south east of the nearest turbine location.</td>
<td>SPA</td>
<td>The Imperial Dock Lock, Leith Special Protection Area (SPA) is a man-made structure at the mouth of the Imperial Dock in the heart of the Port of Leith, and lies within the City of</td>
<td>The Imperial Dock Lock, SPA is classified on account of its breeding common tern colony.</td>
</tr>
<tr>
<td>Site Name and Distance from Site</td>
<td>Designation</td>
<td>Site Description</td>
<td>Qualifying Features</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------</td>
<td>------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Isle of May 26.5 km east of the nearest turbine location.</td>
<td>SAC, SSSI</td>
<td>The Isle of May SAC/SSSI is composed of basaltic rock, there are vertical cliffs up to 60 m high on the west coast from where the island slopes down towards sea level in the east. It has the most extensive and least disturbed maritime cliff grasslands in Fife. It has an area of 70.1 hectares.</td>
<td>The Isle of May supports internationally important numbers of breeding seabirds and grey seals. Grey seals inhabit the Isle of May all year round. During the breeding season in autumn, the island holds the largest grey seal colony on the east coast and the fourth largest in the UK. The Isle of May SSSI is designated as Isle of May Special Area of Conservation (SAC) for Grey seal and on account of its coastal habitats.</td>
</tr>
</tbody>
</table>

It is noted that the SPA and SAC populations of each qualifying feature is likely to change since designation and information will be requested from SNH/MSS on the appropriate reference populations to be used for assessment prior to decommissioning.

Figure 4 - Environmental Designations Close to the Forthwind Site
4. DESCRIPTION OF THE ITEMS TO BE DECOMMISSIONED

The 2B6 is a pitch controlled, two-bladed downwind turbine featuring a 142m rotor diameter. A lattice-type welded truss tower replaces a traditional tower-substructure combination and extends from the seabed to the nacelle, avoiding the substantial load variations that can be created by two-bladed structures using traditional tubular supports.

4.1. Overview

Table 4 details the equipment to be installed for the Forthwind Project. The dimensions provide are based on a preliminary design 3D CAD model and are theoretical – in reality, due to component changes during production, dimensions might be slightly different:

Table 4 - Equipment to be Installed on the Forthwind Project

<table>
<thead>
<tr>
<th>Component</th>
<th>Main Elements</th>
<th>Dimension(s)</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor</td>
<td>Blades</td>
<td>68.25m (l) per blade</td>
<td>Fibreglass Epoxy</td>
</tr>
<tr>
<td></td>
<td>Hub</td>
<td>Contained within the Spinner</td>
<td>Cast Iron</td>
</tr>
<tr>
<td></td>
<td>Spinner</td>
<td>6.6m diameter</td>
<td>Fibreglass Epoxy</td>
</tr>
<tr>
<td></td>
<td>Blade Pitch System</td>
<td>Contained within the Spinner</td>
<td>Miscellaneous (electrical batteries, cast iron housing, etc)</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Main Frame</td>
<td>Forms the base of the nacelle</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td>Nacelle Cover</td>
<td>17.5m (l) x 6m (w) x 8m (h)</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>Electrical Systems</td>
<td>Within the nacelle cover</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td>Mechanical Systems</td>
<td>Within the nacelle cover</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td></td>
<td>Cranes</td>
<td>Within the nacelle cover</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td>Helideck (FWA1 only)</td>
<td>17.8m x 17.8m</td>
<td>Aluminium</td>
</tr>
<tr>
<td>Structure</td>
<td>Transition Piece</td>
<td>5.7m diameter at Yaw bearing</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td>Top Section</td>
<td>32m (h) x 11m diameter at base</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td>Middle Section</td>
<td>49m (h) x 20m diameter at base</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td>Bottom Section</td>
<td>33m (h) x 28m diameter at base</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td>Foundations</td>
<td>Pile (x3)</td>
<td>Total 25m in length</td>
<td>Primary Steel S355</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1m pile stick up, 3m scour depth, 21m in seabed)</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Main Elements</td>
<td>Dimension(s)</td>
<td>Material</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------</td>
<td>--------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| Cables    | Electricity Export Cable (x2) | Turbine FWA1 - 1459.25m (l)  
Turbine FWB1 - 1845.96m (l) |          |

**Table 5 - Turbine Component Weights**

<table>
<thead>
<tr>
<th>Component</th>
<th>Elements</th>
<th>Items contained within include</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor</td>
<td>Rotor</td>
<td>blades, hub, spinner, pitch system, etc</td>
<td>139,000</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Main Frame</td>
<td></td>
<td>101,200</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Main Shaft System</td>
<td>main bearings, housings, covers etc</td>
<td>67,000</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Yaw System</td>
<td>Bearing, drives</td>
<td>19,200</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Electrical Equipment</td>
<td>LVDP, converter, NCP, etc</td>
<td>12,400</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Cooling System</td>
<td>cooler, heat exchanger, etc</td>
<td>8,500</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Gearbox</td>
<td>oil</td>
<td>68,100</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Gearbox high speed coupling to generator shaft</td>
<td></td>
<td>1,200</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Gearbox damper</td>
<td></td>
<td>9,400</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Nacelle Cover</td>
<td></td>
<td>13,000</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Crane System</td>
<td>frame</td>
<td>21,700</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Generator</td>
<td></td>
<td>18,000</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Generator Mounts</td>
<td></td>
<td>400</td>
</tr>
<tr>
<td>Nacelle</td>
<td>Miscellaneous</td>
<td>walkways, technical equipment, etc</td>
<td>19,900</td>
</tr>
<tr>
<td><strong>Total Top Section Mass</strong></td>
<td></td>
<td></td>
<td><strong>499,000</strong></td>
</tr>
<tr>
<td>Structure</td>
<td>Top Section</td>
<td></td>
<td><strong>251,056</strong></td>
</tr>
<tr>
<td>Structure</td>
<td>Middle Section</td>
<td></td>
<td><strong>359,454</strong></td>
</tr>
<tr>
<td>Structure</td>
<td>Bottom Section (including grout pins)</td>
<td></td>
<td><strong>467,922</strong></td>
</tr>
<tr>
<td>Foundation</td>
<td>Pile (total for 3 piles)</td>
<td></td>
<td><strong>168,000</strong></td>
</tr>
<tr>
<td><strong>Total Lower Section Mass (difference of around 1 tonne due to modelling differences)</strong></td>
<td></td>
<td></td>
<td><strong>1,247,539</strong></td>
</tr>
</tbody>
</table>
4.2. Rotor
4.2.1. Blades
The 2B6 is equipped with a 142m rotor consisting of two blades connected to a caster hub via the pitch bearing. The fibre glass epoxy blades are aerodynamically designed to comply with the turbine pitch power control.

4.2.2. Hub
The hub is a cast iron component support the two blades, the pitch drives and other rotor components.

4.2.3. Spinner
The cast rotor hub is covered by a fibre glass enclosure called the spinner. The cover is necessary to protect the pitch system and its auxiliaries against the outside environment.

4.2.4. Blade Pitch System
The blade pitch system is an electrical powered drive-system for the adjustment of the blade position. The pitch motors (one system per blade) are independent and have their own storage battery set. Included within the pitch system is the pitch lock, which is external and is mounted wherever required. It prevents the movement of the blades by using a teethed block which is inserted in the teeth of the blade bearing. With the system locked in place the blade pitch system can be accessed without the risk of personnel injury.

4.3. Nacelle
The nacelle is 17.5 meters long, 6 meters wide and 8 metres high and split into a lower and upper inner level. All levels and areas can be reached directly via stairs from inside the top section of the tower’s transition piece.
4.3.1. **Main Frame**

The main frame is the base component of the whole nacelle arrangement – all components are mounted on, or supported by, the main frame. It is built as a welded construction having two access levels.

The front part of the main frame serves as a foundation for the cooling system, the generator and the high-speed rotating components, while the rear part accommodates the drive train, the transformer and the controller cabinets and panels. The lateral sides of the main frame are supporting the crane frame, while the bottom extremity of the main frame is machined with a very high precision in order to ensure a good connection with the yaw bearing. In the same time, nine yaw drives are connected on the bottom side of the main frame, helping the entire nacelle to yaw around the tower axis.

The main access in the nacelle is done through the transition piece and the bottom level of the main frame.

4.3.2. **Nacelle Cover**

The nacelle cover is made of aluminium and houses the drive train, generator, main frame, electrical cabinets, etc. Roof access is provided to the helideck (FWA1) or hoisting platform (FWA2). The bottom section has hatches facilitating the removal of equipment (by hoisting and lowering).

4.3.3. **Electrical Systems**

The nacelle contains the turbine three 3-phase double fed induction generator, which is used in combination with a converter (two IGBT converter units). The nacelle also houses the turbine transformer.

4.3.4. **Mechanical Systems**

The nacelle contains the machinery components transmitting the torque from the rotor and converting the rotational speed into electrical energy. The main components consist of a main shaft, main bearings and their housing, the main shaft coupling and locking device, gearbox, mechanical brakes, main frame, yaw system and yaw brakes.

4.3.5. **Cranes**

The 2B6 is equipped with 2 cranes; a winch overhead crane (lifting capacity of 2,500kg) to transfer items from sea level to the nacelle (and vice versa) and an on-board crane (lifting capacity of 5,000kg) to transport items within the nacelle.

The crane frame is mounted on the main frame of the turbine. The crane frame beam structure has the function to carry the on-board crane, the winch overhead crane and support the nacelle cover panels.

4.3.6. **Helideck / Hoisting Platform**

A helideck will be installed on top of the nacelle on turbine FWA1 and a hoisting deck integrated into the roof of the nacelle cover on turbine FWB1. The complete kit (helideck and roof) is mounted on the crane frame inside the nacelle.
4.4. The Structure

The 2B6 turbine is a fully integrated design, from nacelle to seabed, eliminating interface risks. The tower structure consists of a tapering three-legged tower, with the legs linked by a steel lattice structure. The structure for the 2B6 wind turbine is defined as the tower between the seabed and the nacelle of the wind turbine. The foundations for the structure (i.e. from the seabed downwards), is not included within this definition.

The Structure supports the boat landing, ladders and lift structure and platforms. To enable the fabrication, transportation and installation, the structure is build up from three sections. The bottom section rises from the foundation to above the splash zone, a middle section around 49m and a top section that completes the Structure to its full height.

The cable system is clipped on to one of the legs and will run from the nacelle to the tower foot.

At the uppermost point of the top section a cylindrical transition piece connects the Structure to the yaw bearing within the main frame of the nacelle.

4.5. Pin Pile Foundation

In the ForthWind project the legs of the turbine will attach directly to the seabed through the use of a pin pile foundation solution. A pin pile is a steel peg that is inserted into the seabed to secure the turbine in place. Each leg in contact with the seabed will require one pin pile.

The preliminary design of the pin piles indicates that they will be inserted to a depth of up to 25m, and will have a diameter of up to 2.5 m. Once installed, piles will be secured by grouting, which involves the injection of cement into the small space between the pile and the pile sleeve.

4.6. Electricity Export Cables

Two individual 10kV cables will connect each turbine to the onshore transformer station. The cable lengths from the turbine to the onshore transformer station will be approximately:

- Turbine FWA1 – 1460 m
- Turbine FWB1 – 1846 m

The cables will be buried in a trench at least 1m in depth, or where this is not possible, protected by concrete seabed mattress. The cables will be contained within a duct just prior to the cables reaching landfall on the Fife Energy Park. The ducting will be installed under the sea defence walls at the Energy park and terminate at a jointing point onshore.
5. DESCRIPTION OF PROPOSED DECOMMISSIONING MEASURES

As is the case throughout the Forthwind development process, from design and fabrication through to installation and operation, the final method of decommissioning will be chosen with due regard to the Best Practicable Environmental Option (BPEO); i.e. the option which provides the most benefit or least damage to the environment as a whole, at an acceptable cost, in both the long and short term.

Forthwind Ltd places Health and Safety as its number one priority. As with installation, where it is possible to either eliminate or mitigate the risk to people and the environment, Forthwind will pursue this option.

In undertaking the decommissioning programme, Forthwind will meet all requirements for navigational safety, environmental protection and health and safety in accordance with current relevant legislation and as specified under the Marine Licence and Section 36 consent granted for the project. The final DP will be informed by navigational risk and safety assessments and will implement methods for risk elimination and mitigation.

There is currently no plan to phase or integrate the Forthwind decommissioning activities with other operations or facilities within the area.

5.1. Proposed Method of Removal

The decommissioning process for the Forthwind turbines will essentially be a reversal of the installation process. A suitably qualified and experienced offshore wind installation contractor will be used to perform and guide the overall decommissioning operations.

The environmental impact of the process was assessed within the Forthwind Environment Statement of July 2015, which concluded that decommissioning activities would be of a smaller environmental impact magnitude that the during installation and construction. Should the final decommissioning method eventually adopted be substantially different to that proposed within this DP, the Environment Statement will be reviewed to ensure that the assessed impacts do not exceed the expected conclusions. The process will be staged on the following basis:

5.1.1. Preparatory Stages

- Commence with mobilisation of the decommissioning vessels to the site;
- The turbine will be de-energized and isolated from the electrical grid and ancillary infrastructure (i.e. the electrical and communication lines) will be disconnected from the turbine and left on the seabed for later recovery.
- All loose or mobile materials, which have the potential to cause harm to the environment and cannot be contained in lifting operations, will be removed for safe disposal onshore.
5.1.2. **Removal of the Turbine Rotor and Nacelle**

- Where appropriate, some internal elements of the turbine may be removed (e.g. generator) to reduce weight and to maintain Health, Safety and Environmental standards.

- The turbine nacelle and blades will be disconnected and removed from the top of the structure in one lift and placed onto the service vessel or barge.

![Diagram of turbine removal process](image)

**Figure 8 - Forthwind Decommissioning Process**

5.1.3. **Removal of the Turbine Structure**

- As detailed previously the structure is built up from three sections. The sections of the structure will be unbolted and lifted in sequence (i.e. from top section to bottom section) onto the service vessel or barge.

- Once the bottom section of the structure is removed, the 3 foundation piles will be cut flush with the seabed.

- All components (rotor, blade and structure) will be transported to an appropriate onshore site, where they will be dismantled and processed for re-use, recycling or safe disposal.

5.1.4. **Electrical and Communication Cabling**

- Following a significant period of time, it is possible that removal of below ground infrastructure (including the foundations) could be more environmentally damaging than leaving it in place. The cabling infrastructure beneath the seabed will be left in situ if it can be demonstrated at the time that it does not pose an unacceptable environmental risk or safety risk to local fishing or amenity activities. However, provision will be made within the decommissioning securities to remove this infrastructure and the requirement to remove subsea infrastructure will be re-evaluated at that time.
• In the base case of leaving the cabling in-situ, the cables will be cut below the seabed and the ends buried to an appropriate depth, so as not to constitute a fishing or navigational hazard.

• In areas where concrete mattress protection is used, it will be removed. The cable will be managed in line with the above bullet point.

• If it is decided that the subsea cabling is to be removed, the cables would be retrieved by lifting the cable ends onto a vessel and spooling the cables back onto a drum. A water jetting or similar tool may be required to assist in the retrieval of the buried cables. Any seabed disturbance or trenches left after cable removal would be subsequently infilled by natural tidal action. The retrieved cables will be transported back to shore for recycling or scrapping.

5.1.5. Ancillary equipment and Post Decommissioning Surveys

• Any waste produced during decommissioning operations will be removed from site on board the service vessel.

• A post decommissioning seabed survey will be carried out and a decommissioning report provided to Marine Scotland.

5.2. Waste Management

Waste management will be carried out in accordance with all relevant legislation at the time of decommissioning. A waste management plan will be developed prior to decommissioning which will consider the waste hierarchy (re-use, recycling, recovery and disposal) when considering the appropriate disposal route for all waste items. All waste processing or disposal will take place at appropriate licensed waste facilities.

A summary of the appropriate waste routes for the turbine components is provided in table 6

<table>
<thead>
<tr>
<th>Main Elements</th>
<th>Material</th>
<th>Waste Management Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blades</td>
<td>Fibreglass Epoxy</td>
<td>Disposal or recycle where facilities exist</td>
</tr>
<tr>
<td>Hub</td>
<td>Cast Iron</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Spinner</td>
<td>Fibreglass Epoxy</td>
<td>Disposal or recycle where facilities exist</td>
</tr>
<tr>
<td>Blade Pitch System</td>
<td>Miscellaneous</td>
<td>Energy recovery, recycling or disposal via landfill where appropriate. Handling and disposal will comply with legal requirements, follow best practice and Material Safety Data Sheet recommendations.</td>
</tr>
<tr>
<td>Main Frame</td>
<td>Primary Steel S355</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Nacelle Cover</td>
<td>Aluminium</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Electrical Systems</td>
<td>Miscellaneous</td>
<td>Energy recovery, recycling or disposal via landfill where appropriate. Handling and disposal will comply with legal requirements,</td>
</tr>
<tr>
<td>Main Elements</td>
<td>Material</td>
<td>Was Management Solution</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>follow best practice and Material Safety Data Sheet recommendations.</td>
</tr>
<tr>
<td>Mechanical Systems</td>
<td>Miscellaneous</td>
<td>Energy recovery, recycling or disposal via landfill where appropriate. Handling and disposal will comply with legal requirements, follow best practice and Material Safety Data Sheet recommendations.</td>
</tr>
<tr>
<td>Cranes</td>
<td>Primary Steel S355</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Helideck (FWA1 only)</td>
<td>Aluminium</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Transition Piece</td>
<td>Primary Steel S355</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Structure Sections</td>
<td>Primary Steel S355</td>
<td>Reuse or recycle</td>
</tr>
<tr>
<td>Foundation Piles</td>
<td>Primary Steel S355</td>
<td>Leave in situ</td>
</tr>
<tr>
<td>Electricity Export Cables</td>
<td>Miscellaneous</td>
<td>Leave in situ (or disposal/recycle where removal is appropriate)</td>
</tr>
</tbody>
</table>

### 5.3. Predicted Degradation, Movement and Stability of any Remains

The DP proposes to cut the foundation piles flush with the seabed surface and ensure that this remaining infrastructure is safe for fishing and navigation. There is no expected movement of the subsurface piles, as they will be held firmly in place by the surrounding bedrock. As the piles will be capped and below the seabed surface it is not anticipated that there will be any scouring over in the long term and scour pits are not expected to form.

As discussed earlier, all subsea cabling is proposed to be left in-situ, if it can be demonstrated at the time that it does not pose an unacceptable environmental risk or safety risk to local fishing or amenity activities. In this case the cables will be cut below the seabed and the ends buried to an appropriate depth, so as not to constitute a fishing or navigational hazard.

### 5.4. Alternative to Decommissioning after 20 years

The current preferred option for decommissioning is the complete removal of turbines, as described above. However, an alternative option may be to repower the turbines. Repowering may involve the replacement of some elements of the turbines, or the complete replacement of the turbine, blades and/or structure. The 2B Energy technology system, components and maintenance programme have been designed to facilitate, after installation, an operational life of 40 years, similar to a conventional thermal power plant.

To pursue this approach, Forthwind would need to obtain consent from the relevant authority under the appropriate legislation to operate for a further 20 years before reaching the end of the current consented operational life. This approach would also need to consider the relevant environmental aspects and ensure that the turbine and structure achieve certification under the appropriate standards at that time to operate for a further 20 years. An assessment of the relevant aspects and final decision will be made a number of years before the end of the project consented operational life.
6. **ENVIRONMENTAL IMPACT ASSESSMENT**

   In support of the consent applications, Forthwind prepared an Environmental Impact Assessment, reported in the Environment Statement dated July 2015. This took a lifecycle approach to assessing the impacts of the development including decommissioning (as far as it could be predicted).

   Should the final decommissioning method eventually adopted be substantially different to that proposed within this DP, the Environment Statement will be reviewed to ensure that the assessed impacts do not exceed the expected conclusions. Subject to the results of this review, and taking account of any changes in legislation, changes in the proposed decommissioning methods, or changes in the condition of the baseline environment (beyond those predicted by the ES), it is not currently proposed to undertake a new EIA prior to decommissioning (in line with the relevant DECC guidance).

7. **CONSULTATIONS WITH INTERESTED PARTIES**

   In accordance with the Notice under Section 105 of the Energy Act 2004 Decommissioning of Offshore Installations (received from Marine Scotland on 09 May 2017), Forthwind will undertake consultations with the following statutory consultees:

   - Chamber of Shipping
   - Cockenzie & Port Seaton Fishermen’s Association
   - Fife Council
   - Fife Fishermen’s Association
   - Forth Ports
   - Forth Yacht Clubs Association
   - Historic Environment Scotland
   - Marine Safety Forum
   - Marine Scotland
   - Maritime and Coastguard Agency
   - Northern Lighthouse Board
   - Royal Society for the Protection of Birds
   - Royal Yacht Association (Scotland)
   - Scottish Environment Protection Agency
   - Scottish Natural Heritage
   - Scottish Creel Fishermen’s Association
   - Scottish Canoe Association
   - Scottish Fishermen’s Federation
   - UK Chamber of Shipping

   A copy of this draft DP has been emailed to the consultees above and Forthwind has also made this available publicly on the 2B Energy website: [www.2benergy.com](http://www.2benergy.com).

   The consultation period is 30 days long and will commence on 06 November 2017 and end on 06 December 2017. Please send any comments to marc.murray@2benergy.com. The draft DP will be updated to take account of any comments and/or information gained from consultees.

8. **COSTS**

   This information is commercially sensitive and therefore not included in this draft for consultation.
9. **FINANCIAL SECURITY**

This information is commercially sensitive and therefore not included in this draft for consultation.

10. **SCHEDULE**

A full decommissioning schedule will be provided closer to the time of decommissioning. The schedule will set out a detailed plan of the proposed decommissioning works for consultation with the relevant authorities and for approval by the Scottish Ministers.

Currently, it is proposed that full decommissioning of the development will commence 20 years after commissioning of the Development, to coincide with the end of the consented period.

The duration of the decommissioning phase is estimated to around 1 month to complete although the final duration and programme of the decommissioning works will be provided in the final DP prior to the start of decommissioning.

11. **PROJECT MANAGEMENT AND VERIFICATION**

When final review of the DP takes place towards the end of the installation’s life, information will be provided on how Forthwind will manage the implementation of the decommissioning programme and provide verification to Government concerning progress and compliance. In accordance with Annex E of the DECC Decommissioning Guidance Notes for Industry, this will include a commitment to submit a report, detailing how the programme was implemented. It is intended that this report will be submitted within 4 months of completion of decommissioning.

12. **SEABED CLEARANCE**

During the decommissioning of the Forthwind Project all waste produced will be removed from the site onboard the service vessels (see Section 5.5). On completion of the decommissioning programme, the site will be restored such that no objects or protrusions will be present above the seabed surface and no debris posing a hazard to the marine environment or navigation shall remain.

Following completion of the decommissioning works, an independent survey company will be commissioned to complete seabed surveys around the project site (an area to be confirmed with the appropriate regulator at that time) to confirm that decommissioning has been undertaken in accordance with this DP and that no unintended items associated with the operational project or decommissioning activities have been left on the seabed. This company will report in parallel to both Forthwind and the Scottish Ministers.

13. **RESTORATION OF THE SITE**

The project development area will be restored to the condition it was prior to construction, as far as is reasonably practical. In line with this DP the site will be restored such that no objects or protrusions will be present above the seabed surface and no debris posing a hazard to the marine environment or navigation shall remain.

Further details on how the site will be restored will be provided in the updated DP towards the end of the project’s life.

14. **POST-DECOMMISSIONING MONITORING, MAINTENANCE AND MANAGEMENT OF THE SITE**

Following decommissioning, post-decommissioning seabed survey and restoration of the site by Forthwind there would be no further monitoring, maintenance or management of the site.
15. SUPPORTING STUDIES


Magnetometer Survey, T2R Turbine location, Methil Offshore Wind Farm, August 2016, Project Ref: A6023, Rev:00, Aspect Surveys.


16. REFERENCES


The Energy Act 2004 (as amended); Available online: http://www.legislation.gov.uk/ukpga/2004/20/contents

The Town and Country Planning (Scotland) Act 1997 (as amended); Available online: http://www.legislation.gov.uk/ukpga/1997/8/contents

ANNEX 1 – PRELIMINARY DESIGN OF THE FORTHWIND STRUCTURE