

Pentland Floating Offshore Wind Farm

Onshore EIA Report: Non-Technical Summary (Vol 1)

GBPNTD-ENV-XOD-RP-00017



Contents

1 Introduction

1.1 Project Background, Needs, and Benefits

1.2 Alternatives Considered

1.3 The Onshore Development

1.3.1 Construction and Installation

1.3.2 Operation and Maintenance

1.3.3 Decommissioning

1.4 EIA Methodology

1.5 Consultation

2 Geology, Hydrogeology and Hydrology

3 Land Use, Agriculture and Soils

4 Terrestrial Ecology

5 Terrestrial Ornithology

6 Air Quality, Climate and Carbon

7 Onshore Archaeology

8 Landscape and Visual

9 Traffic and Transport

10 Onshore Noise and Vibration

11 Opportunity to Comment



1

Introduction

Introduction

Highland Wind Limited (HWL) has submitted an application for Planning Permission in Principle (PPP) under the Town and Country Planning (Scotland) Act 1997 for the construction and operation of the onshore components of the Pentland Floating Offshore Wind Farm (PFOWF) ('the Project').

HWL is majority owned by a fund managed by Copenhagen Infrastructure Partners (90%) with HexiconAB as a minority shareholder (10%). Development of the Project is being led by CIP's development partner, Copenhagen Offshore Partners.

The Project comprises both offshore and onshore components:

- **The 'Onshore Development':** All onshore components associated with the PFOWF. Buried onshore cables that will export electricity from the PFOWF Array (the location of the turbines offshore) inland to connect to the National Electricity Transmission System (NETS) network, via the Scottish and Southern Energy (SSE) Dounreay Substation; and
- **The 'Offshore Development':** All offshore components of the PFOWF including up to seven floating wind turbines connected by inter-array cables and supported by floating structures, mooring lines and anchors. Up to two offshore export cables that will export electricity generated by the turbines to a landfall location at the Dounreay coast.

The Onshore Development, which is the subject of this PPP application, is located at the coast of Dounreay, Caithness, in Scotland, immediately adjacent to the western boundary of the Vulcan Naval Reactor Test Establishment (Vulcan NRTE) and the Dounreay Site (former nuclear facility), approximately 14 km west of Thurso. The location of the Onshore Development is referred to as the 'Onshore Site'. The Onshore Site is shown in red in relation to the Offshore Development on [Figure 1](#).

The Onshore Site is located within the administrative area of The Highland Council (THC), and therefore the planning application has been submitted to THC. The planning application is accompanied by an Environmental Impact Assessment Report (EIAR) that details the Onshore Development's potential environmental effects identified by the Environmental Impact Assessment (EIA). The Onshore EIAR presents this information and describes the Onshore Development's potential to give rise to environmental effects during the construction, operation and maintenance and decommissioning phases, both for the Onshore Development when considered in isolation and when considered cumulatively with other plans and projects. The EIAR also identifies and presents proposed management and mitigation measures that may be employed to reduce the potential effects identified.

An application for the offshore components of the PFOWF (the Offshore Development) has been submitted separately to Marine Scotland and so the Offshore Development is not included within this application. However, the potential for cumulative effects of the entire PFOWF project (i.e. the Offshore Development and the Onshore Development) are considered within the Onshore EIAR where relevant.

The purpose of this Non-Technical Summary (NTS) is to summarise the findings of the EIA and other key information contained within the Onshore EIAR, which has been prepared to support the application. Full technical details of the EIA and all the assessments summarised here can be found within the Onshore EIAR (Volume 2) and supporting Appendices (Volume 3).

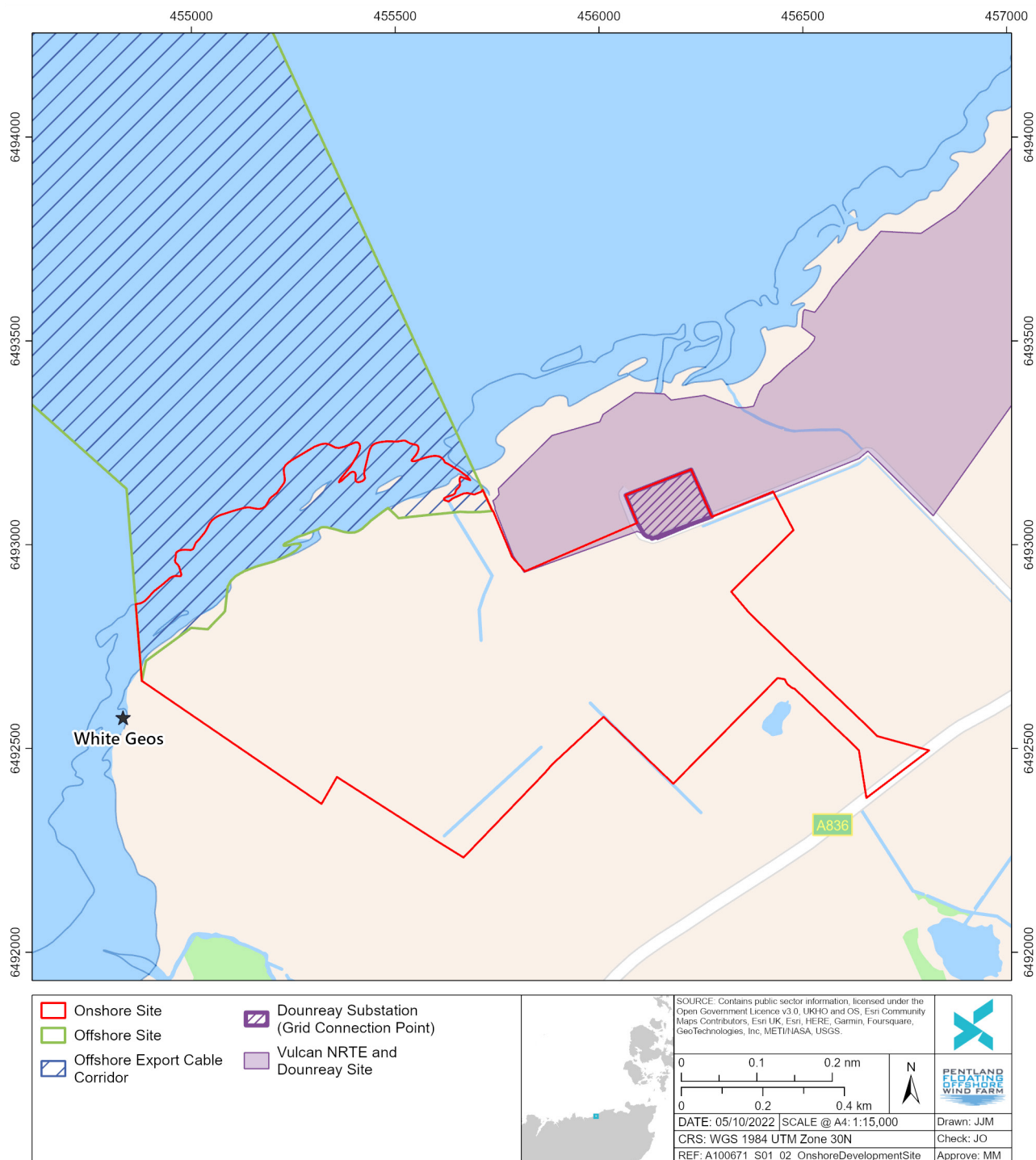


Figure 1 Location of the Onshore Transmission Infrastructure associated with the PFOWF

1.1 Project Background, Needs, and Benefits

PFOWF is being developed by HWL, a Special Purpose Vehicle established to deliver the Project, to test and demonstrate emerging floating offshore wind technologies in Scottish waters. HWL acquired the Dounreay Trì Floating Wind Demonstration Project (the 'Dounreay Trì Project'), previously owned by Dounreay Trì Limited (in administration), in 2021. The Dounreay Trì Project was granted onshore and offshore consents in 2017 which were assigned to HWL in 2021. The Onshore Site includes and expands upon the consented Dounreay Trì Project onshore development area. While similar onshore infrastructure is proposed within the new application, a larger area is now required for improved co-existence with, and to avoid, so far as possible, overlap with the consented but not yet built SSE Scottish Hydro Electric Transmission (SHE) Dounreay West Substation.

The Scottish Government has set a new target for offshore wind capacity of 11 gigawatts by 2030, supporting the delivery of Scotland's 2019 Offshore Wind Policy Statement and the landmark Climate Change (Emissions Reduction Targets) (Scotland) Act (2019) (the 'Act'). The Act commits the Scottish Government to reaching net zero emissions of all greenhouse gases by 2045, five years ahead of the United Kingdom (UK). The Act also includes ambitious interim targets which require emission reductions of 75% by 2030 and 90% by 2040, compared to 1990 levels. The PFOWF will contribute towards meeting these targets by generating around 100 MW of renewable electricity whilst also helping to secure Scotland's reputation as a world leader in floating offshore wind technology. Critically, floating offshore wind has the potential for faster deployment than fixed-bottom offshore wind projects and can be used in deep-water sites, thereby enabling access to stronger and more consistent wind resources.

PFOWF will be capable of providing clean energy to approximately 70,000 homes, equivalent to around 65% of homes in the Highland Local Council Area (based on 2020 figures). It will also deliver economic benefits to the local community and Scotland by providing jobs and opportunities for the local supply chain.

The Onshore Development also has the benefit of being considered a development priority according to the National Planning Framework 3 (NPF3) (2014) in terms of the cabling voltage associated with the Onshore Substation. NPF3 identified development priorities as those that would fulfil the need for sustainable economic growth and the transition to a low carbon economy, and thus the Onshore Development will contribute to fulfilling this need.



1.2 Alternatives Considered

Throughout the development process, a number of alternatives have been considered for the location and the design of the Onshore Development.

The Dounreay Tri Project received consent in 2017 for an offshore export cable corridor (OECC) to the landfall and an onshore consent for works above the Mean Low Water Springs (MLWS) mark. HWL reviewed this information to determine whether this remained the most suitable location for the Onshore Development.

In selecting the landfall for the Onshore Development, the following factors were considered and weighted:

- Suitability of landfall options;
- Minimisation of potential environmental impact(s);
- Cable stability and protection;
- Minimisation of the number of cable and pipeline crossings;
- A route for the OECC that is as direct as possible; and
- The potential onshore route to the grid connection point.

Within this review process, three different landfall options were considered in terms of their environmental and technical constraints. The preferred landfall location was identified as the previously consented Dounreay location, adjacent to the Vulcan NRTE site. This was primarily due to its avoidance of environmentally sensitive features and proximity of options to connect into the existing grid network in the vicinity of Dounreay.

1.3 The Onshore Development

The purpose of the Onshore Development will be to supply electricity generated by the Project to the wider electricity grid network. The Onshore Development will include the onshore components that connect the wind farm to the grid at the existing Dounreay substation. Key components of the Onshore Development include the following elements, which are further explained in the sections below:

- Cable landfall: The point where the offshore export cables from the PFOWF Array will reach the shore and connect to the onshore cables;
- Transition joint bay (TJB): A concrete underground structure where offshore export cables and onshore cables are spliced together;
- Onshore cables: Onshore electricity cables running from the TJB to the onshore substation;
- Cable joint bays (CJB): Typically required every 500 to 1,000m to string together sections of onshore cable;
- Substation: A substation (including all electrical infrastructure such as transformers and switchgears) located within the onshore site;
- Construction compound, to accommodate a temporary work site, including parking, welfare facilities, offices and changing rooms; and
- Access tracks: Temporary access tracks required during construction and permanent accesses for operation.

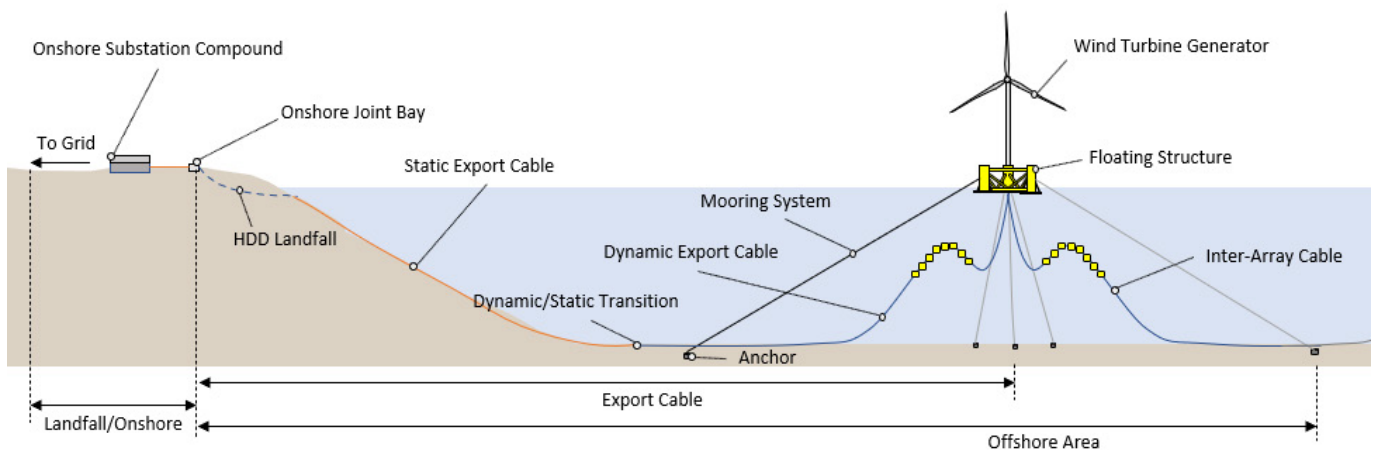


Figure 2 Schematic representation of the Onshore Development linked to the PFOWF Array.

Onshore Site access during construction is likely to be via an existing access road to the existing SSE Dounreay Substation from the A836 which will require upgrades and re-surfacing. Alternatively, access may be permitted via the existing access road to the Vulcan NRTE, this will be subject to permissions of the Ministry of Defence.

The final locations of the components of the Onshore Development will be determined based on a further approval process, landowner discussions and interactions with other projects also developing in the area.

The Onshore Development has adopted a Design Envelope approach to the assessment and this PPP application. This is because at this early stage in the development process for the Onshore Development it is not possible to finalise the specifics of the project design, due to:

- Procurement and supply chain considerations associated with emerging technologies;
- The timing of investment decisions; and
- Further site investigations which inform the final project design.

The Design Envelope will be further refined as the development of the Onshore Development progresses.

A detailed construction programme will be developed as design and procurement activities progress. Construction of the Onshore Development is anticipated to take place over an approximate 18-month period, likely starting in 2024 at the earliest. Most of the construction and installation activities are anticipated to take place in 2024 including enabling works, access roads, substation civil works, plant delivery, services and plant installation, intertidal works, onshore cabling, and drainage. Electrical plant installation is expected to begin in 2024 but carry into 2025. Landscaping and commissioning will be carried out in 2025.

The dates provided are indicative at this stage and final sequencing and phasing of the construction works will be confirmed once the final design of the Onshore Development is known, following consent (if granted) for the proposal.

1.3.1 Construction and Installation

Installation of the offshore export cable(s) at the landfall will be via horizontal directional drilling (HDD). This is a method whereby small pilot holes are drilled on land that lead to a point between 400 – 700 metres offshore through which the cables will be pulled. During construction a working area will be established on land (in an area typically called an HDD compound) and this will accommodate the drilling equipment and other cable installation equipment required at the landfall. The HDD compound will also be used to contain the TJB at the cable landfall point. The TJB is required to house the joint between the offshore export cables and onshore cables. Following connection of the cables, the TJB may be backfilled and reinstated.

From the point of landfall, buried onshore cables will be used to export the electricity generated by the Project. Once the onshore cable routes are finalised the appropriate cable installation method will be confirmed; however, it is anticipated that open-cut trenching will be the primary installation method, with HDD undertaken if obstacles, such as watercourses, are encountered. CJBs may also be required to string together the onshore cable sections. Following the cable jointing operation, the CJBs will be backfilled, and the ground restored. At this point a manhole cover will be the only visible surface level structure remaining from the TJB and the CJB. The manholes are required to provide access for routine inspection and maintenance purposes during the operational lifespan of the Project.

The construction of the onshore substation would firstly involve establishing access roads and preparing the site for construction, followed by construction of the main building and installation of electrical equipment, and lastly landscaping and commissioning. Onshore substation equipment will be delivered into the construction compound or directly to its installation location within the Onshore Site and assembly of the equipment will take place in both the Onshore Site and in the construction compound.



1.3.2 Operation and Maintenance

Once the substation is constructed, it will operate continuously (24 hours a day, seven days a week), except during planned shutdowns for maintenance. The substation will be unmanned during operation and there will be no day-to-day personnel on site during normal operation. There will be a limited amount of traffic to and from the substation for general operation and maintenance purposes, which is expected to be around four vehicles per month. A monthly site visit will be required for visual inspection of site security systems and general maintenance checks. There will also be routine inspections/maintenance of the underground cable system during operation which will involve regular and ad-hoc visits to the manholes, as required.

1.3.3 Decommissioning

The Onshore Development will be decommissioned following the end of its operational life which is not fixed but is expected to be approximately 30 years. A Decommissioning Plan will be prepared prior to decommissioning. As advances in technological capabilities for decommissioning and/or changes to legislation may occur over this time, best practices and legislation at the time of decommissioning will be applied.

Decommissioning activities would likely involve the onshore substation and switchgear to be disconnected from the high voltage transmission system, de-energised and all equipment earthed, and the electrical equipment would be dismantled and re-used/recycled where possible. Onshore cables would likely remain buried to prevent further disruption, with the above ground installations removed.

1.4 EIA Methodology

The principal aim of undertaking an EIA is to ensure that the relevant competent authority determining an application for a particular development makes its decision in full knowledge of any potential significant environmental effects on the environment. The EIA methodology adopted and applied within the Onshore EIAR has been developed based upon the experience of the EIA technical experts with reference to industry best practice, guidance and EIA principles.

EIA is a process of systematically identifying the potential impacts and resultant effects (both beneficial and adverse) of a proposed development throughout all phases including construction, operation and maintenance, and decommissioning. The potential impacts identified for each phase of a development are assessed for the development in isolation and cumulatively with other nearby developments.

For the Onshore Development, this process required a detailed understanding across all phases of the Onshore Development's life-cycle and the environment within which the Onshore Development will be located. Potential impacts were identified and then evaluated to determine whether the Onshore Development could have any effects on the environment and the significance of those effects. Where potential effects are likely to be significant, specific mitigation measures have been identified to manage, reduce, remove, or offset such effects where possible.

For all EIA topics assessed, the potential impacts of the Onshore Development were assessed based on the 'realistic worst case' parameters contained within a 'Design Envelope'. These worst case parameters were discussed with consultees throughout the EIA process where appropriate. Worst case parameters, such as substation footprint, cable installation method, etc., necessarily differ from EIA topic to topic (e.g. the development design with the greatest potential to affect ecological habitats may not be the

development design with the greatest potential to affect landscape and visual receptors). Within each chapter of the EIAR the worst case parameters for the receptors assessed are set out in full with clear justification as to why this is the case. Given that the worst case is based on the design option (or combination of options) that represents the greatest potential for change, confidence can be held that development of any alternative options within the design parameters will give rise to no effects greater or worse than those assessed within the EIAR.

1.5 Consultation

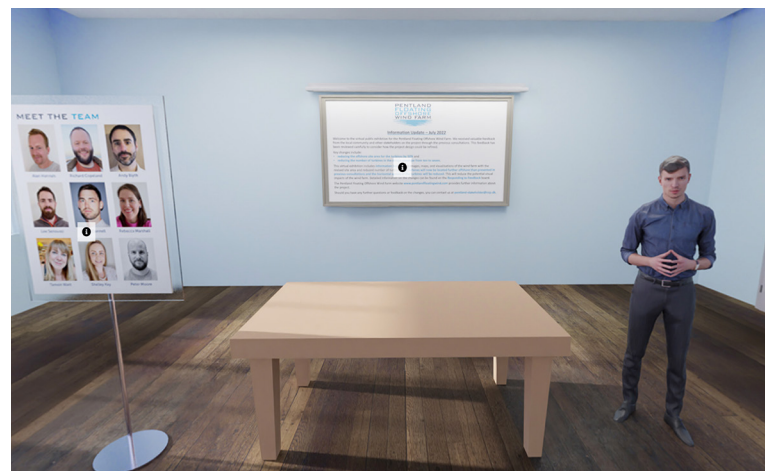
HWL have undertaken a range of consultation activities in advance of submission of the applications for the Onshore Development. Consultation has included:

- Virtual public engagement in the form of three online exhibitions held from 27th September to 31st October 2021; the 9th May to 20th May 2022 and from the 29th August to 19th September 2022. Each exhibition included a series of question-and-answer sessions;
- In-person public engagement events involving drop-in events at the Reay Golf Course and the North Coast Visitor Centre in Thurso in May 2022;
- Engagement with consultees during the EIA Scoping phase and throughout the EIA process, to refine and inform the EIA approach and ensure that stakeholder concerns were considered; and
- Meeting with community councils and other community groups.

Additionally, HWL maintains a website dedicated to the PFOWF as an online consultation tool with up-to-date information on the progress of the Project and details of how the public can contact the project team (www.pentlandfloatingwind.com).

HWL's overarching aim with regard to engaging stakeholders on the Project is to ensure the development of an environmentally and socially responsible project that benefits the local community. The engagement approach has focused on targeted consultations, supported by clear objectives, to avoid unnecessarily burdening stakeholders.

This robust consultation process has resulted in a number of recommendations being made in terms of the design of the Project, particularly for the Offshore Development, which have now been incorporated into the Design Envelope. The process also allowed HWL to provide information on specialist topics such as agreed methodologies for impact assessments. The feedback received has also been useful to guide the mitigation measures proposed. Furthermore, the consultation events have proved to be a good opportunity to initiate dialogue and build relationships with key individuals and groups.





2 Geology, Hydrogeology and Hydrology

2 Geology, Hydrogeology and Hydrology

The Onshore Development has been assessed in relation to potential impacts on Geology, Hydrogeology and Hydrology during the construction, operational and maintenance and decommissioning phases. The geology study area for the assessment is the Onshore Site itself and the hydrology study area is the Onshore Site plus a 250m buffer (which was determined by professional judgement and consideration of relevant guidance).

Information on the Onshore Site was compiled from a desk study using data and information held by THC, British Geological Survey, NatureScot and the Scottish Environment Protection Agency (SEPA). Information from the baseline information was verified by a field walkover survey and other site-specific assessments including site investigation boreholes undertaken in 2021. The assessment was undertaken considering the sensitivity of receptors identified during the baseline study and any embedded mitigation measures incorporated as part of the site design and project description.

The Onshore Site is underlain by superficial deposits comprising glacial till and bedrock deposits of the Dounreay Siltstone Formation and Sandside Bay Sandstone Member. Limited amounts of groundwater are anticipated beneath the Onshore Site, either within sand and gravel areas within the glacial till deposits or in the upper areas of the underlying bedrock.

The Onshore Site drains northwards to the Pentland Firth. The Sandside Bay Site of Special Scientific Interest (SSSI) and North Caithness Cliffs Special Protection Area (SPA) are located immediately north of the Onshore Site. Other than small field drains and the Dounreay Burn, no other watercourses are recorded within the Onshore Site. Additionally, no private or licensed abstractions are recorded within the Onshore Site.

Some mitigation measures are embedded in the design of the Project, either through the site design (e.g. avoidance of direct overlap with the Sandside Bay SSSI) or in accordance with good practice guidance. Impacts on Geology, Hydrology and Hydrogeology will also be minimised through implementation of a Construction Method Statement (CMS) and a Construction Environmental Management Plan (CEMP), which will be developed as conditions of any planning permission granted and which will include a Pollution Prevention Plan.

The potential impacts from the construction, operation and maintenance and decommissioning of the Onshore Development on Geology, Hydrogeology and Hydrology has been assessed. The impacts assessed included effects on geological features, drainage patterns, pollution of watercourses and contaminated land.

The assessment concluded that, as a result of the design of the Onshore Development and adoption of embedded mitigation, the Onshore Development would not result in any significant effects on Geology, Hydrogeology and Hydrology receptors during construction, operation and maintenance or decommissioning. All effects were assessed as not significant.

Potential cumulative impacts of the Project, with other plans and projects in the area, were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation and the West of Orkney Wind Farm landfall, due to the potential overlap with the Onshore Site. Due to the relatively limited extent of effects from the Onshore Development all cumulative effects were assessed as not significant.





3

Land Use, Agriculture and Soils

3 Land Use, Agriculture and Soils

The Onshore Development has been assessed in relation to potential impacts on Land Use, Agriculture and Soils during the construction, operational and decommissioning phases. These impacts could arise as a result of a change, loss, or degradation of the land and its natural resources, changes of the access requirements of the area, or the potential interference with subsoil infrastructure. The study area used for this assessment is the extent of the Onshore Site itself.

The baseline of the assessment was established via desktop research using available published literature, and a field walkover survey to gather information on the soils, land use, property, recreational areas, utilities and access tracks present within the study area.

The land in the study area is generally flat and is mainly used for agriculture. The energy infrastructure associated with the Dounreay Site and Vulcan NRTE is located in the northeast corner. The soils in the study area are predominantly gleys (poorly drained organic soils) which are capable of average production though high yields of barley, oats and grass, which is not considered to be prime agricultural land.

Commonly used methodologies have been utilised to assess the potential effects of the Onshore Development, including recognised approaches to quantifying the effects during the construction of a development, its operation and maintenance and its subsequent decommissioning.

During the construction phase, the direct loss of agricultural land as a result of the Onshore Development will be up to 6.05 hectares (ha) which is not considered to have any significant change on the land use of the study area. During construction, it is expected that there may be interference with agricultural operations and changes to access requirements, however, any adverse effects would be temporary during the construction period and managed in consultation with landowners to agree scheduling of the works and to minimise effects.

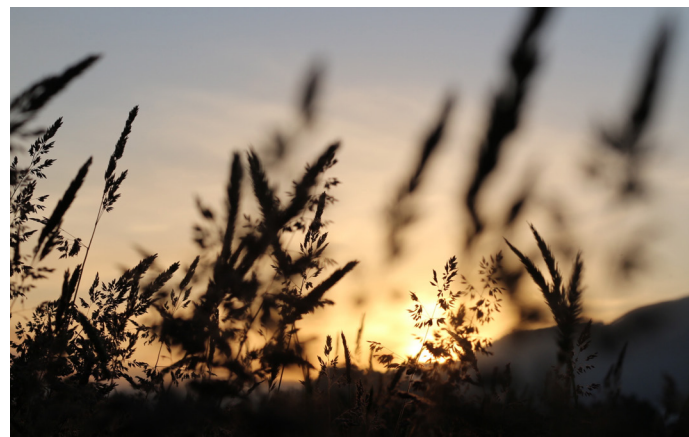


Changes to soil quality and agricultural drainage will be minimised through embedded mitigation and best practice workings, including the implementation of the Construction Method Statement (CMS) and the Construction Environmental Management Plan (CEMP) which will be required as part of any planning permission granted. It is considered that the soil recovery following the construction period would be achieved following reinstatement of the land post construction without significant adverse effects. Any potential damage to utilities would be managed through mapping, consultation and agreements with respective utilities providers as standard best practice. With consideration of the above, no significant effects were identified through the construction phase.

Impacts assessed through the operation and maintenance phase were effects on soil and sediment quality from pollution or contamination, loss of agricultural land, and changes to access requirements. The CEMP will also include a Pollution Prevention Plan and Oil Spill Contingency Plan which will minimise the risks associated with the operational effects on the soil, through identifying and monitoring potential hazards before they occur and mitigating the effects of any pollution in the unlikely circumstance that it occurs by having processes and procedures in place. The loss of agricultural land as a result of the operational Onshore Development is calculated to be 0.78 ha, which is not assessed to be a significant loss. Any changes to access requirements during operation and maintenance are assessed to be negligible, as the majority of the Onshore Site will have no public access restrictions and the small vehicle numbers expected for maintenance purposes will not result in a significant effect upon access.

It is expected that the effects upon land use during the decommissioning phase would be broadly similar to or lesser than those during the construction phase and therefore not significant.

Potential cumulative impacts of the Project with other plans and projects in the area were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation and the West of Orkney Wind Farm landfall, due to the potential overlap with the Onshore Site. Due to the relatively limited extent of effects from the Onshore Development, all cumulative effects were assessed to be not significant.





4

Terrestrial Ecology

4 Terrestrial Ecology

The Onshore Development has been assessed in relation to potential impacts during construction, operation and maintenance, and decommissioning phases on terrestrial ecology (excluding birds, which are considered separately below), including cumulative impacts. The assessment has focused on direct habitat loss due to land-take (as a worst case resulting in up to 6.05 ha of habitat loss), disturbance and damage/injury to habitats or protected species and indirect effects on habitats or protected species, e.g. due to pollution. In order to inform this assessment, a desk study, stakeholder consultation, and baseline surveys for habitats and protected species were undertaken within the Onshore Site and appropriate buffers (between 50 m and 250 m) depending on best practice guidance for the habitat and species-specific surveys.

Following implementation of embedded mitigations such as pollution prevention controls, habitat reinstatement, pre-construction surveys, systems to prevent disturbance to Ground Water Dependant Terrestrial Ecosystems (GWDTE), avoidance of buildings within 30 m (for bat roosts) and avoidance of sensitive coastal habitats within 50 m of the cliff line, no significant effects are predicted on terrestrial ecology as a result of the Onshore Development in isolation or cumulatively with other projects. The key assessment findings are detailed below.

Three habitats corresponding to those protected under Annex I of the Habitats Directive were identified within the survey area: wet heath (also a GWDTE), maritime rock-crevice community, and maritime grassland. However, the wet heath is located outwith the Onshore Site, and so no impacts are predicted on this habitat. The other habitats are coastal. As no works will occur within 50 m of the coastline, no impact or adverse effects upon these maritime communities is predicted.

Four species of plant of conservation concern may occur within the Onshore Development area: Scottish primrose, an eyebright (*Euphrasia marshallii*), sun spurge, and northern knotgrass. Scottish primrose and the eyebright occur in coastal habitats, which will not be affected by the proposed works. The other two species are arable weeds occurring in already disturbed ground. Pre-construction surveys for northern knotgrass and sun spurge are proposed as additional mitigations and following implementation no significant effect is predicted for any of these species.



Invertebrate communities of conservation importance associated with coastal habitats are known to occur, including the following species: great yellow bumblebee, moss carder bee, and small blue butterfly. However, as no impact upon the coastal habitats is anticipated, and the food plants of these species do not occur elsewhere within the Onshore Site, no impact or adverse effects upon these notable invertebrates is anticipated.

Otters were found to use the Onshore Site during surveys, although the habitat is suboptimal for this species and it is likely they only commute through or forage at the Onshore Site very occasionally. In addition, embedded mitigations will ensure habitats will be reinstated following construction and so any loss of suboptimal habitat will be negligible and temporary. Otters are protected from intentional or reckless harm, but the embedded mitigations during construction will minimise risk to otters and other protected species. Following the implementation of embedded mitigations, no significant effects are predicted.



There are several buildings within the Onshore Development and survey area which have the potential to support roosting bats. However, no construction is expected within 30 m of these in line with the embedded mitigations and where this can't be avoided pre-construction bat roost surveys will be conducted. With the implementation of these embedded mitigation measures no significant effects are predicted for bats.

Suitable habitat for reptiles, including refugia (rubble piles, rubble mounds and rocks) and sandy patches with potential as basking habitat, is present within the Onshore Site. Reptiles are protected from intentional or reckless harm, and the embedded mitigations will be employed during construction to minimise this risk. With this embedded mitigation, no significant effects are predicted.

Potential cumulative effects of the Project with other developments in the area were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation and the West of Orkney Wind Farm landfall projects. With embedded mitigations in place for the Onshore Development, including consultation with these neighbouring developments, no significant cumulative effects on Terrestrial Ecology receptors are anticipated.





5

Terrestrial Ornithology

5 Terrestrial Ornithology

The Onshore Development has been assessed in relation to potential impacts on terrestrial ornithology during the construction, operational and maintenance and decommissioning phases.

The ornithology study area for the assessment is the Onshore Site itself plus a 500 m buffer (consistent with NatureScot guidance). The study area contains a range of habitats for terrestrial birds. Most of the study area is treeless farmland with large fields of agricultural grassland and cropland managed for livestock grazing and fodder production. The coast along the northern edge has different habitats for birds in the form of an exposed cobble beach and intertidal rocks with pools. Immediately to the east, the Vulcan NRTE and the Dounreay Site has additional bird habitats, including industrial building, areas of hard standing and 'waste' ground.

A baseline bird survey was conducted in 2021 of the onshore study area to quantify the distribution and abundance of breeding and non-breeding birds. The survey results update the findings of surveys carried out in 2015 and 2016 undertaken to inform the application for the proposed onshore elements of the previously consented Dounreay Tri project. The surveys identified that several species of conservation importance use the survey area, including breeding and non-breeding species. The breeding species of conservation importance occurred in relatively small numbers, with lapwing, curlew, oystercatcher, barn owl and skylark breeding on the farmland areas, and ringed plover, Arctic tern and eider breeding along the coast. The non-breeding birds of conservation importance recorded on farmland habitats are the regular presence of small to moderate numbers of greylag geese, lapwing and curlew and the occasional presence of small numbers of whooper swan. The non-breeding bird interests of the coastal habitats are small to moderate numbers of feeding and roosting waders, including curlew, ringed plover, purple sandpiper and turnstone. Two locations regularly used by waders as high-tide roost sites were identified. No birds of prey nested in the survey area, however, outside the breeding season, single kestrel, merlin and hen harrier were occasionally seen hunting.



The study area is not covered by any statutory nature conservation sites designated to protect birds. A single SPA, Caithness Lochs SPA (between 6 and 36 km from the Onshore Site), is identified as having relevance on account that some of the greylag geese and whooper swans that roost there may sometimes forage in the vicinity of the Onshore Site.

The assessment considered the potential impacts of the Onshore Development on Terrestrial Ornithology interests arising from habitat loss/change and disturbance effects during the construction and decommissioning phases, and operational disturbance. HWL has made commitments to a number of embedded measures designed to avoid or reduce negative effects on terrestrial birds and bird habitats, including spatial and temporal considerations related to construction activities and habitat restoration and enhancement measures. Specifically, these measures include a Breeding Bird Protection Plan, appointment of an independent Environmental Clerk of Works to audit site activities, and a commitment to Best Practice Measures in relation to Breeding Birds. With these commitments in place, no significant effects to terrestrial ornithology interests are predicted.

In terms of cumulative impact, it was concluded that the potential significance of ornithology impacts from the Onshore Development alone were so low that they would not contribute to a significant regional level cumulative impact. Therefore, no cumulative impacts during construction, operation and maintenance, or decommissioning were required to be assessed in the EIAR.





6

Air Quality, Climate and Carbon

6 Air Quality, Climate and Carbon

The proposed Onshore Development has been assessed in relation to potential impacts on Air Quality, Climate, and Carbon during the construction, operational and decommissioning phases. All effects during operation and maintenance, except those in relation to carbon emissions, were scoped out at the scoping stage in consultation with relevant stakeholders and did not require assessment.

Baseline information was compiled from a desk study using data and information held by THC, the Met Office, the Department for Environment, Food and Rural Affairs, and relevant air quality assessments undertaken around the Onshore Site. The study areas for this assessment are the Onshore Site plus a 100 m buffer and a 500 m buffer which adheres to the Institute of Air Quality Monitoring guidance for the identification of human and ecological receptors.

For the air quality assessment, a number of receptors were identified within the study area, including residential and non-residential properties, amenity areas (including Reay Golf Course and the North Coast 500), designated sites (including the North Caithness SPA and Sandside Bay SSSI) and Red Data List Species (Lapwing and Skylark) that were identified within the study area.

The assessment considered impacts from dust that could arise through construction and decommissioning works. HWL has committed to the implementation of a number of embedded mitigation measures to ensure dust effects are appropriately managed through the construction and decommissioning works. These include the production of a Dust Management Plan which will include the potential for dust monitoring to be agreed with THC, if required. When considering the embedded mitigation measures that will be implemented during the construction and decommissioning works, effects on air quality were assessed to be not significant.



A carbon assessment has been undertaken to evaluate the carbon cost and savings of the Onshore Development, in context of the wider climate scenario. The carbon assessment considered the carbon cost during construction from materials used and transportation and how these emissions are offset by the carbon savings of the Offshore Development through the supply of clean electricity.

The carbon emissions from the Onshore Development, including how materials are sourced, transportation movements and embodied carbon, was totalled at 8,833 tonnes of carbon dioxide equivalence (CO₂e) (as a worst-case scenario). The Onshore Development itself will not result in carbon savings, however the Offshore Development will have a significant carbon saving by displacing 132,400 te CO₂e emissions annually as a result of the electricity generated from the Wind Turbine Generators. As such, there is not considered to be any adverse impact regarding carbon during the operational lifetime of the Onshore Development. In the wider context of the UK's emissions, this total represents a negligible contribution and can be seen as necessary in order to facilitate the carbon savings that would be achieved during the operational phase of the Project.

Potential cumulative effects of the Project with other plans and projects in the area were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation and the West of Orkney Wind Farm landfall projects. With embedded mitigations in place for the Onshore Development, including adherence to a CEMP and consultation with these neighbouring developments, no significant cumulative effects on air quality, climate and carbon receptors are anticipated.



7

Onshore Archaeology

7 Onshore Archaeology

The Onshore Development has been assessed in relation to potential impacts on onshore archaeology during the construction, operational and decommissioning phases.

A desk-based study, which utilised the results of previous watching briefs and walkover survey were undertaken to characterise the known historic environment assets (i.e. archaeology features that we know the location and details of) in the Onshore Site as well as the potential for unidentified assets (i.e. archaeology features that we do not know the location) to be present. The area for identifying the onshore historic environment baseline and potential direct impact upon it comprised the Onshore Site plus a buffer of 500 m as agreed with Historic Environment Scotland and THC. The area assessed for potential impacts from the development on the setting of historic assets comprised a 5 km radius from the boundary of the Onshore Site as agreed with Historic Environment Scotland and THC. Eleven Scheduled Monuments and eleven Listed Buildings that could potentially be affected were identified within this study area.

One Scheduled Monument, Cnoc Urray, was identified within the Onshore Site by the baseline characterisation studies. Three sites of low or negligible value were identified within the Onshore Site, and another three of uncertain importance. The archaeological watching briefs conducted within the Onshore Site boundary indicated that the potential for unknown assets is low, except for the area around and west of Cnoc Urray where the potential is moderate to high and is therefore considered in the assessment of impact on unknown assets.



The impacts assessed included loss or damage to known and unknown historic environment assets and long term changes to the setting of onshore historic environment assets. The design of the Onshore Development will seek to avoid all known heritage assets. HWL has also committed to embedded mitigation measures which include the development of a Written Scheme of Investigation (WSI) and Protocol for Archaeology Discoveries (PAD).

During all phases of the Onshore Development, there will not be any direct impact upon Cnoc Urray. Due to the embedded mitigation of avoidance, there will also be no significant impact on any other known heritage assets in the study area. In the extremely unlikely event that avoidance is not possible (i.e. if the cable route overlaps with known assets), additional mitigation of geophysical survey and evaluation trenching to investigate known assets, as well as the previously uninvestigated area (that was not surveyed during previous watching briefs or walkovers) around the southern part of the Onshore Site (in case of the presence of unknown heritage assets), will ensure that there is no significant impact.

The assessment of potential long term effects upon the setting of historic assets concluded that there would be no significant effects as a result of the relatively low influence of the onshore substation against the existing baseline of infrastructure of the Vulcan NRTE, the Dounreay Site and the SSE Dounreay substation.

Potential cumulative effects of the Project with other plans and projects in the area were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation, the West of Orkney Wind Farm landfall, decommissioning activities at the Dounreay Site and Vulcan NRTE and five onshore wind farms (within 5 km of the Onshore Site). With embedded mitigations in place for the Onshore Development, including implementation of a WSI, no significant cumulative effects on onshore archaeology are anticipated.



8

Landscape and Visual

8 Landscape and Visual

The potential impacts on the landscape and visual receptors that would arise as a result of the Onshore Development have been assessed in the Landscape and Visual Impact Assessment (LVIA) Chapter, during the construction, operation and decommissioning phases. The process taken involved identifying those receptors with the potential to be significantly affected and assessing the potential effects that the Onshore Development would give rise to. The significance of these impacts has been assessed through combining the sensitivity of each receptor with a prediction of the magnitude of change that would occur as a result of the Onshore Development.

The Onshore Substation is the component of the Onshore Development with greatest potential to give rise to significant effects. In respect of the LVIA, the worst-case scenario for the Onshore Substation will comprise a 65 m x 65 m footprint with a maximum 14 m height from foundation level. As the exact location of the Onshore Substation is not yet known, two indicative locations have been assessed in this LVIA; Option 1 and Option 2. Option 1 is located to the immediate south of the operational SSE Substation and Option 2 is located to the west. Assessment of these two indicative locations ensures that all potential significant effects are being considered. The location of the Onshore Substation options are shown in Figures 13.1 in Onshore EIAR (Volume 4): Technical Appendix 13.2.

The LVIA study area for the Onshore Development covers a radius of 5 km. The 5 km extent of the study area is based on descriptions of the onshore components of the Project, good working knowledge of the area, and information drawn from maps showing the zone of theoretical visibility (ZTV) of the Onshore Development. These sources have shown that visibility of the Onshore Development will be largely contained within the 5 km study area. Within this area, those receptors with the potential to be significantly affected have been assessed in detail. This included four Landscape Character Types (LCTs), two Local Coastal Character Areas (LCCAs) and five viewpoints. Figures including plans, photographs, wirelines and photomontages are presented in Onshore EIAR (Volume 4): Technical Appendix 13.2.

The focus of the assessment has been the impacts of the Onshore Substation during the construction and operational phase. The effects during the decommissioning phase, when the Onshore Substation will be dismantled, will be no greater than the effects assessed in respect of the construction phase. The detailed methodology for carrying out the LVIA is presented in Onshore EIAR (Volume 3): Technical Appendix 13.1.



The assessment of impacts on landscape and coastal character found that no significant effects will arise as a result of the Onshore Development within any of the LCTs or LCCAs that occur in the onshore study area. The assessment of impacts on the five representative viewpoints found that no significant effects will arise as a result of the Onshore Development on any of the visual receptors within the onshore study area.

Cumulative assessment was also undertaken looking at two scenarios. The Scenario 1 cumulative assessment considers the cumulative effect of the Onshore Development in conjunction with the operational developments and following consented developments; the Dounreay Site and Vulcan NRTE decommissioning; SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation; Limekiln Wind Farm Resubmission and Extension; and Hill of Lybster Wind Farm. The Scenario 2 cumulative assessment considers the cumulative effect of the Onshore Development in conjunction with the operational, under-construction and consented developments set out above, along with the application stage development of Forss III Wind Farm. The Scenario 1 and 2 assessments found that there would be no significant cumulative effects on any of the landscape or visual receptors in respect of all operational, under construction, consented and application stage large-scale developments.

This assessment relates largely to the existing baseline influence from other large-scale energy developments in the local area, including the ongoing decommissioning of the Dounreay Site and Vulcan NRTE. This is mainly because adjacent operational substations and overhead electricity transmission lines will still remain, and onshore wind farms will be visible in the local landscape. The Onshore Substation will also be comparable or smaller in scale to the existing and proposed energy developments on adjacent sites and this will moderate any additional influence. The Onshore Development will not redefine the character of this local landscape nor will it redefine the character of the views experienced by local residents, road-users, workers, or walkers in this area.





9

Traffic and Transport

9 Traffic and Transport

The Onshore Development has been assessed in relation to potential impacts on traffic and transport during the construction, operational and decommissioning phases.

An assessment has been undertaken of the impacts from increased traffic flow required to support the Onshore Development. An assessment of the Onshore Development traffic cumulatively with other nearby developments utilising the same road network has also been undertaken. The assessment focuses on the construction phase of the Onshore Development as the worst-case scenario for traffic generation. Traffic related impacts may result from the import of general construction materials transported via 'conventional' heavy goods vehicles (HGVs) and low loaders.

The study area for the focus of this assessment includes the local road network that would be utilised by the traffic associated with the proposed development along the A836 and A9 through Thurso. The A836 is most frequently used by commuters to the Dounreay Site and the Vulcan NRTE, and for users of the North Coast 500 and National Cycle Routes.

To undertake the assessment, baseline traffic flows have been obtained from count point data available from the Department for Transport and the capacity performance of the A836 has been calculated and compared against the existing 24-hour baseline traffic flows. The baseline data has been reviewed against the estimated vehicle numbers to be generated during the peak construction period of the Onshore Development.



The assessment undertaken demonstrates that the Onshore Development construction traffic will result in an increase of no more than 3% in the total vehicles on the A836 and no more than a 1% increase in light vehicles. The additional construction HGVs will result in a temporary increase of up to 120% on the A836. On the A9, the additional construction traffic will have a reduced impact, with less than a 1% increase in total vehicles, less than a 1% increase in light vehicles and up to 13% increase in HGVs. The results show that while the total traffic levels are within the guideline thresholds (IEMA, 1993) ¹ of a 30% increase to traffic flows along the A836, HGV generation is significantly increased. Based on these results, an assessment on potential effects on road safety, community severance, noise and vibration, vulnerable road users, and dust and dirt has been undertaken.

This assessment considered the proposed embedded mitigations and management plans for the Onshore Development including a Construction Traffic Management Plan (CTMP) and Traffic Statement. The CTMP will outline a mitigation strategy for the impact of road-based traffic with a focus on access routes, managing HGV delivery times to avoid peak periods, road safety awareness and provision of information to the public, possible interaction with other developments under construction, and good practice guidance such as wheel washing and careful loading. These embedded mitigation measures will reduce the potential for adverse effects on traffic and transport receptors. These documents will be prepared and agreed with THC.

Potential cumulative effects of the Project with other plans and projects in the area were also assessed in respect of the construction phase. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation, the West of Orkney Wind Farm landfall, decommissioning activities at the Dounreay Site and Vulcan NRTE and seven onshore wind farms (with possible overlap of the local road network during construction). With embedded mitigations in place for the Onshore Development, including implementation of a CTMP and consultation with these neighbouring developments, no significant cumulative effects on traffic and transport are anticipated.

¹ Institute of Environmental Management and Assessment (IEMA) (1993). Guidelines for the Environmental Assessment of Road Traffic.



10

Onshore Noise and Vibration

10 Onshore Noise and Vibration

The Onshore Development has been assessed in relation to potential impacts on Onshore Noise and Vibration during the construction, operational and decommissioning phases. The assessment considers impacts on the noise-sensitive residential receptors located nearest to the Onshore Site. The study area for this assessment is the Onshore Site plus a 1 km buffer (as based on professional experience, receptors greater than 1 km from the Onshore Site would experience significantly less effects from noise and vibration from the Onshore Development therefore assessment of the closest receptors is sufficiently representative).

Following consultation with THC, it was agreed to undertake the assessment based on a qualitative assessment of the baseline noise environment. The baseline noise has been characterised as being typical of rural locations, with relatively low levels particularly during quiet periods, but with some localised sources such as traffic from the A836, coastal waters and the industrial activities at the Dounreay Site and Vulcan NRTE which will increase the noise levels at times. The assessment has also considered potential cumulative impacts from the Dounreay West Substation, which is a consented development overlapping the Onshore Site, as other developments further away were considered unlikely to have significant cumulative implications.



Construction noise has been assessed through a desk-based study of potential construction activities on a worst-case basis, by assuming the proposed development is constructed using standard and common methods. Construction noise, by its very nature, tends to be temporary and highly variable and therefore much less likely to cause adverse effect. Embedded mitigation including in particular the restrictions of hours of working have also been taken into consideration within the assessment. Construction work which is audible from any noise-sensitive receptor (including HGV deliveries) will only take place on the site between the hours of 07:00 to 19:00 on Monday to Friday inclusive and 07:00 to 16:00 on Saturdays, with no construction work proposed to take place on a Sunday, or on national public holidays. The exception to this is HDD and cable pulling works which may require periods of evening, weekend and

night activity to complete. Any other deviations from these working hours will be agreed with relevant parties prior to implementation.

A CEMP will also be prepared as a condition of any planning permission granted and this will be submitted to THC prior to construction of the Onshore Development. This will include good practice measures to manage construction noise based on the guidance in BS 5228-1.

In addition to embedded mitigation, good practice measures and general restrictions on working times, it was recommended to undertake further assessment and engagement with neighbouring residents when the final location of the proposed Onshore Development infrastructure and working methods have been determined. The potential for concurrent construction of the Dounreay West Substation will also be considered at this time. This will be developed and agreed in consultation with THC.

Operational noise from mechanical and electrical equipment associated with the Onshore Substation has also been assessed and the results indicate that noise levels at neighbouring receptors are unlikely to give rise to significant effects based on typical level of emissions for similar facilities. However, it was recommended that an updated assessment of operational noise should also be undertaken, including consideration of cumulative operational noise from the Dounreay West Substation once the final location of the Onshore Substation has been determined.

Potential cumulative impacts of the Project with other plans and projects in the area were also assessed in respect of the construction, operational and decommissioning stages. The projects which were identified as having the potential to act cumulatively with the Onshore Development were the SHE Transmission Orkney – Caithness cable, SSE Dounreay West Substation and the West of Orkney Wind Farm landfall, due to the potential overlap with the Onshore Site. The assessment determined that if the most noise intensive construction works of the Onshore Development and the SSE Dounreay West Substation were to overlap, the CEMP should consider additional mitigation such as engagement with nearby residents, adjustments to construction programmes or further noise management measures (such as screening) in order to reduce the cumulative impact to not significant. There is the potential for cumulative operational noise from the Onshore Development and SSE Dounreay West Substation, however at the final detailed design stage the requirement for additional mitigation will be determined and delivered through an Operational Environmental Management Plan (OEMP) in order to ensure noise thresholds are not exceeded and the cumulative operational impact is therefore not significant.



11

Opportunity to Comment

11 Opportunity to Comment

In accordance with legislative requirements and industry best practice, submission of the planning application for the Onshore Development will be advertised, and the EIA Report will be publicly available. Stakeholder engagement will continue following submission and there will be an opportunity to make formal representations to THC.

Paper copies of the EIAR and other supporting documentation will be made available for public inspection at:

Reay Village Hall

Reay

Thurso

KW14 7RE

The EIAR, including all figures, technical appendices and accompanying documents are also available to view on the project website at www.pentlandfloatingwind.com. Anyone having difficulty accessing the information through this website can contact pentland-stakeholder@cop.dk for assistance.

Hard copies of the application submission may be obtained at a charge reflecting the actual cost of print production and postage, estimated at approximately £750. A hard copy of the Non-Technical Summary is available free of charge. To request a copy of the application submission or the Non-Technical Summary please contact pentland-stakeholder@cop.dk.

Additionally, the application documents are available via the THC consents portal <https://wam.highland.gov.uk/wam/>. If you would like to make a formal representation on our planning application to THC, whether to object, to support or make a general comment, this must be undertaken within 21 days of the date that the application was either registered with THC, when you were notified of the application as a neighbour, or where the application was advertised by THC, whichever is the later date.

A full guide on how to make a formal representation to THC and THC's formal representation process is available on THC website at: www.highland.gov.uk/info/planning_applications.

**PENTLAND
FLOATING
OFFSHORE
WIND FARM**



4th Floor 115 George Street,
Edinburgh,
Midlothian,
Scotland,
EH2 4JN

www.pentlandfloatingwind.com

