



Revised Larbrax Wind Farm

Environmental Impact Assessment Report (EIA Report)

Volume 1: Non – Technical Summary (NTS)



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1. Introduction

1.1 Background

- 1.1.1 Orsted Onshore UK Limited ('the Applicant') is seeking planning permission from Dumfries and Galloway Council under the Town and Country Planning (Scotland) Act 1997 (as amended) ('the Act') to construct and operate the Revised Larbrax Wind Farm ('the Proposed Development') comprising up to four wind turbines with a maximum tip height of up to 149.9 metres (m) and a battery energy storage system (BESS). The Proposed Development is categorised as a 'Major' development under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulation 2009 as it will have an installed capacity of over 20 megawatts (MW).
- 1.1.2 The Proposed Development is proposed on the Site of the previously consented but unbuilt Larbrax Wind Farm (hereafter referred to as the 'Consented Larbrax Wind Farm') which, although originally refused by Dumfries and Galloway Council in 2015, obtained planning permission on appeal from the Scottish Ministers in 2016 for up to eight wind turbines with a blade tip height of up to 100 m. The Proposed Development is being proposed as a replacement to the Consented Larbrax Wind Farm. The Applicant wishes to maximise the energy yield and efficiency from the Site by employing fewer but more advanced and powerful turbines, as supported by the Scottish Government's Onshore Wind Policy Statement. The Proposed Development Site is located approximately 9 kilometres (km) west of Stranraer within the Dumfries and Galloway Council administrative area and is shown on **Figure 1**.
- 1.1.3 The application for planning permission is accompanied by an Environmental Impact Assessment Report (hereafter referred to as the 'EIA Report') which presents the findings of the Environmental Impact Assessment (EIA). The EIA has been undertaken by LUC and specialist subconsultants on behalf of the Applicant in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as 'the EIA Regulations') to assess the likely significant environmental effects of the construction and operation of the Proposed Development and will be used to inform decision making by Dumfries and Galloway Council.
- 1.1.4 This document is a Non-Technical Summary (NTS) of the EIA Report and provides a concise and easy to understand overview of the Proposed Development and the key findings of the EIA Report. The text is supported by **Figures 1-3** and **Images 1-10** which are referenced throughout.

1.2 The Applicant

- 1.2.1 This application is being made by Orsted Onshore UK Limited ('the Applicant'). Headquartered in Denmark, Ørsted is one of the world's leading renewable energy companies and is active in the USA, Europe, Asia, the UK and Ireland. Since 2018, Ørsted has expanded significantly and now has a portfolio of 8.2 Gigawatts (GW) of operating and under construction capacity across wind, solar, and energy storage. In June 2021, Ørsted acquired BRUK, which subsequently was rebranded to Orsted Onshore UK Limited. Through the acquisition of BRUK, as well as the business in Ireland, Ørsted expanded its presence into onshore renewables in the UK and entered the Irish market.

1.3 Environmental Impact Assessment

- 1.3.1 An EIA is required and carried out where a proposed development has the potential to result in significant environmental effects. As it is considered possible that the Proposed Development may result in significant environmental effects, an EIA has been undertaken to accompany the application for planning permission under the Act.
- 1.3.2 EIA involves the compilation, evaluation and presentation of any likely significant environmental effects resulting from a proposed development, to assist the consenting authority (in this case Dumfries and Galloway Council), statutory consultees, and the wider public when considering an application.
- 1.3.3 EIA is an iterative process which means that the early identification of potentially significant effects can also inform the design of a proposed development so that adverse environmental effects can be avoided, reduced and if possible, removed at an early stage. EIA also identifies where additional mitigation may be required in order to address and further minimise adverse effects.
- 1.3.4 The EIA Report presents information on the identification and assessment of the likely significant environmental effects resulting from the Proposed Development across a number of environmental topics. The significance of these effects has been assessed using criteria defined in the topic chapters of the EIA Report. Where appropriate, or as

otherwise defined, the significance of effects has been categorised as Major, Moderate, Minor or Negligible. In the context of the EIA Regulations, likely effects assessed as being of 'Major' or 'Moderate' significance are considered to be significant effects, and where possible, will require additional mitigation measures to be implemented. It should be noted that a significant environmental effect does not automatically mean that a proposal should be refused planning permission. Rather, these will be key considerations to be taken into account by the decision-making authority.

- 1.3.5 The scope and content of the EIA were informed by an EIA Scoping exercise. Although no EIA Scoping Opinion was received from Dumfries and Galloway Council within the statutory timescales, the EIA was progressed on the basis of the content of the EIA Scoping Report, professional judgement and experience. Additional consultation was undertaken by the topic specialists throughout the EIA process to inform the assessments.
- 1.3.6 As required by the EIA Regulations, the EIA Report has been prepared by 'competent experts' in relevant specialisms.

1.4 Overview of the Site

- 1.4.1 The Site is located within a relatively remote area in the north-west of the North Rhins Peninsula to the west of Stranraer and occupies an area of 345 ha. The Site slopes gently from east to west towards the coast and is therefore relatively low-lying – see **Image 1**.
- 1.4.2 The Site's land cover primarily consists of improved pasture grassland associated with the working Meikle Galdenoch Farm, with some areas of boggy marshlands in the east around Galdenoch Moor. Woodland coverage is limited to small coniferous plantations used as shelterbelts in the north and south, and broadleaf trees adjacent to the B738 in the east.
- 1.4.3 A number of minor watercourses and field ditches drain the Site, generally flowing west out to the North Channel. The Green Burn runs along the eastern boundary of the Site and eventually drains into the Galdenoch Burn north of the Site. The Galdenoch Burn flows north of the Site boundary eventually draining to the North Channel north of Port Beg. Some areas of standing water, including Loch More and Loch Beg, are present due to the relative flat topography of the Site.
- 1.4.4 There are no properties within the Site, but properties are located within the surrounding area and are mainly single rural dwellings farmhouses and holiday cottages. The closest properties to the Site include Greenburn, Meikle Galdenoch and Galdenoch Mill Cottage (north-east), Larbrax Lodge (east), Larbrax Cottages and Meikle Larbrax (south). Within the wider area there are a number of small rural settlements including Portpatrick, approximately 7.5 km to the south and Leswalt, approximately 4 km to the east. Several camping, caravan and chalet sites are present in the wider surrounding area.
- 1.4.5 The Site lies within the Rhins Coast Regional Scenic Area (RSA) and the Salt Pans Bay Site of Special Scientific Interest (SSSI) is within the south-western part of the Site.
- 1.4.6 The Site location is shown on **Figure 1**.



Image 1: Site Topography

2. Development Description

2.1 The Proposed Development

- 2.1.1
- The main components of the Proposed Development, for which planning permission is being sought, comprise:
 - Up to four wind turbines each with a maximum tip height of up to 149.9 metres (m);
 - Foundations supporting each wind turbine;
 - Associated crane hardstandings at each turbine location;
 - Approximately 3 kilometres (km) of onsite access tracks (comprising 2 km of new tracks and 1 km of upgraded tracks);
 - Up to eight watercourse crossings (comprising four new and four upgraded) and associated infrastructure;
 - A network of underground cables to connect the turbines to the onsite substation;
 - A control building and substation;
 - A Battery Energy Storage System (BESS) to complement renewable energy generation;
 - A new Site access junction on the B738; and
 - Habitat management and enhancement proposals.
- 2.1.1
- In addition to the above components associated with the operation of the Proposed Development, construction of the Proposed Development will also require the following components/works:
 - One temporary construction compound comprising site offices, car parking and laydown/storage areas;
 - One temporary borrow pit (for the extraction of stone);
 - Temporary clearance/laydown areas at each turbine location; and
 - Removal of 0.28 hectares (ha) of trees/vegetation to facilitate access into the Site.
- 2.1.2
- Figure 2** shows the layout of the Proposed Development including the key components noted above.

Comparison of Consented Larbrax Wind Farm with the Proposed Development

- 2.1.3
- A comparison of the components of the Consented Larbrax Wind Farm with the components of the Proposed Development is provided in **Table 1** and shown on **Figure 3**. Larger turbine foundations and hardstandings required for the Proposed Development reflect the candidate turbine manufacturer's specifications.

Table 1: Comparison of Consented Larbrax Wind Farm with the Proposed Development

Component Details	Consented Larbrax Wind Farm	Proposed Development
Turbines	Eight of up to 100 m to blade tip 2.5 MW capacity	Four of up to 149.9 m to blade tip Approximately 5 MW capacity
Turbine foundation	346 m ² per turbine based on 21 m diameter	491 m ² per turbine based on 25 m diameter
Turbine hardstanding	880 m ² per turbine	2819 m ² per turbine
Battery Energy Storage System (BESS)	None	Approximately 10 MW
Visible Aviation lighting	None	None
Access tracks (new)	5.31 km	1.90 km

Component Details	Consented Larbrax Wind Farm	Proposed Development
Access tracks (upgraded)	None	1.05 km
Access track width	5.5 m	6 m
Construction compounds	One CC1: 10,125 m ² (75 m x 135 m)	One CC1: 1,500 m ² (30 m x 50 m)
Substation	One 1,375 m ² (25 m x 55 m)	One 1,500 m ² (30 m x 50 m)
Borrow pits	Two BP1: 1,034 m ² (47 m x 22 m) BP2: 19,950 m ² (190 m x 105 m)	One BP1: 6,400 m ² (80 m x 80 m)
Watercourse crossings	Eight	Eight (four new and four upgraded)
Met mast	1 (60 m high)	None
Cable trenches	1 m x 1 m	1.5 m x 1.5 m
Land take (permanent)	4.04 ha	3.45 ha
Site area	558.4 ha	345 ha

Access

- 2.1.4 Access to the Site will be taken from the B738 on the eastern extents of the Site via a new junction located approximately 440 m north of the junction between the B738 and the access to Larbrax Lodge – see **Figure 2**. The new junction will provide access to the Site for all Abnormal Invisible Loads (AILs) associated with the turbine deliveries, as well as access for heavy goods vehicles (HGVs) delivering construction materials and general site traffic. The new junction will be gated following construction and will continue to provide access to the Proposed Development for maintenance during operation.
- 2.1.5 Construction and staff traffic associated with the Proposed Development will approach the Site from the north and east using the A75, A77, A751 and B738. Turbine components will be delivered to the King George V Docks in Glasgow. AIL vehicles will then transport the components to the Site via the M8, M74, A74(M), A6/M6, A75, A77 and the B738 – see **Image 2**. **Image 4** shows a typical abnormal load vehicle.

Tree and Vegetation Management

- 2.1.6 To facilitate access into the site, approximately 0.28 ha of broadleaf trees and vegetation will be removed, the majority of which comprises dense rhododendron which lines the edge of the B738. As an invasive species, the removal of this vegetation for the access junction will form part of wider biodiversity enhancement measures, as detailed below. Any trees removed as part of this felling will be replaced via compensatory planting in compliance with the Scottish Government's Control of Woodland Removal Policy (CoWRP).

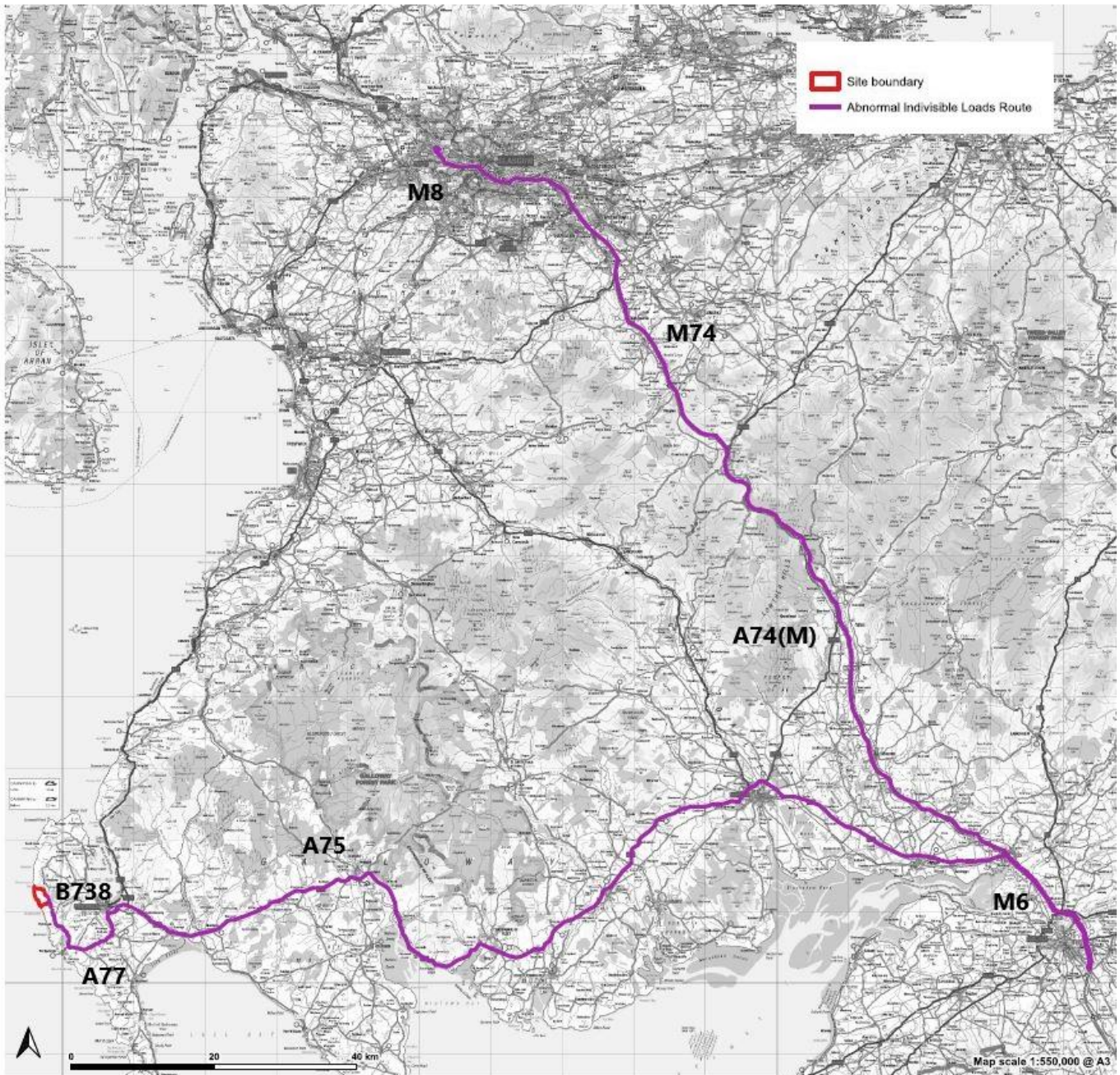


Image 2: Proposed Turbine Component Delivery Route

Construction Timescales and Lifespan of the Proposed Development

- 2.1.7 Subject to the granting of planning permission, it is anticipated that the construction of the Proposed Development will last for up to 12 months. Planning permission is being requested to operate the Proposed Development for 35 years.
- 2.1.8 At the end of the 35-year operational period, the Proposed Development may be fully decommissioned, or an application may be made to extend its operational life. Decommissioning will involve the following activities:
- Dismantling and removal of wind turbines and electrical equipment;
 - Restoration of the turbine areas, hardstanding and tracks; and
 - Demolition and removal of substation equipment and energy storage equipment.

2.2 Benefits of the Proposed Development

Environmental Benefits

Carbon Balance

- 2.2.1 The purpose of the Proposed Development is to generate electricity from a renewable source of energy, offsetting the need for power generation from the combustion of fossil fuels. The Proposed Development will also potentially contribute to the decarbonisation of heat and transport networks and ultimately contribute towards Scotland's net zero obligations. Consequently, the electricity that will be produced by the Proposed Development will result in a saving in emissions of carbon dioxide (CO₂) with associated environmental benefits.
- 2.2.2 It is calculated that the CO₂ emissions that will be emitted as part of the construction of the Proposed Development will be paid back within approximately 0.7 years (roughly 8.5 months). Following this period, the Proposed Development will, in effect, be in a net gain situation and will contribute to national objectives to reduce carbon emissions.

Habitat Restoration and Enhancement

- 2.2.3 As part of the Proposed Development and in accordance with National Planning Framework 4 (NPF4) Policy 3, which requires that major developments conserve, enhance and restore biodiversity, an Outline Biodiversity Enhancement Management Plan (OBEMP) has been prepared. The OBEMP proposes a Biodiversity Enhancement Area (BEA) of approximately 24.62 ha comprising six land parcels (A-F) within which management and enhancement works are being considered – see **Image 3**. The overall goal of the BEMP is to restore, enhance and create habitats of ecological value in these areas, which in turn will benefit existing flora and fauna as well as increase biodiversity in general. The OBEMP will be refined and developed through consultation with key stakeholders and will result in a more formal BEMP to be implemented and monitored during the lifetime of the Proposed Development.
- 2.2.4 In summary, the current OBEMP proposals include the following measures:
- Area A (12.35 ha) - Restoration and enhancement of blanket bog habitat, and improvement of bog habitat condition;
 - Areas B, C and D (6.43 ha) - Reclamation, restoration and enhancement of moorland habitat through rhododendron removal and management;
 - Area E (3.70 ha) - An extensive scheme of rhododendron removal and management within existing woodland; and
 - Area F (2.14ha) - A scheme of rhododendron and bracken removal and management.
- 2.2.5 Further details of the biodiversity restoration and enhancement proposals can be found in **Appendix 7.5: Outline Biodiversity Enhancement and Management Plan** of the EIA Report.



Image 3: Proposed Biodiversity Enhancement Areas

Homes Powered and Community Benefits

- 2.2.6 It is estimated that the number of households that could be potentially powered by the Proposed Development is approximately 24,200 UK householders per year, based on the Proposed Development having an indicative capacity of 19.2MW. This prediction is based on the latest Department for Energy Security and Net Zero (DESNZ) and Digest of UK Energy Statistics (DUKES) figures, which provide an average UK annual household electrical consumption of 3,239 kilowatt-hours (KWh). Site specific wind data and modelling found that the Site has a capacity factor (a measure of the efficiency of the turbines) of 46.6% compared to the UK average of 30% according to the DESNZ.
- 2.2.7 As well as contributions to the generation of low carbon electricity and the resulting offsetting of carbon emissions, the Proposed Development shall also provide the opportunity for local communities to benefit financially from its operation at the prevailing Scottish Government recommended value, currently £5,000/MW of installed capacity, for each year of operation for up to 35 years. At the current recommended rate, community benefit payments could total £96,000 per annum (index linked) and £3.36 million (plus inflation adjustment) over the course of the Proposed Development's 35-year operational life, although this will be dependent on the rating of the turbines chosen.

- 2.2.8 The Applicant is committed to supporting skills development and local job opportunities through the Proposed Development. The Applicant wishes to continue with the Larbrax Wind Farm Skills Fund which was announced in 2014 as part of the Consented Larbrax Wind Farm. In addition, the Applicant offers local communities surrounding its projects the opportunity to own part of the project and will discuss shared ownership opportunities with the local community in further detail should planning permission be granted.
- 2.2.9 Further details of the Proposed Development and its benefits can be found in **Chapter 4: Development Description** of the EIA Report.



Image 4: Typical Abnormal Load Vehicle Transporting Turbine Blade

3. Site Selection and Design Strategy

3.1 Site Selection

3.1.1 The Proposed Development Site has been selected for a number of reasons, such as:

- The 'planning precedent' has already been established for wind energy development at this location through the Consented Larbrax Wind Farm;
- The Site has an excellent wind resource given its exposed coastal location. This presents the opportunity to develop without the need for government support or subsidy, whilst providing a contribution towards climate change and renewable energy targets;
- The Site is not within a National Park or National Scenic Area (NSA) which preclude development of wind farms according to national planning policy (NPF4 Policy 11);
- The nature of the Site allows for good opportunities to explore and provide extensive habitat management and enhancement in accordance with NPF4 Policy 3;
- There are no key environmental constraints which will preclude development, or which cannot be avoided through careful design and mitigation;
- Existing land use (improved pasture grassland) is compatible with the development of a renewable energy scheme;
- Access is possible to the Site from the public road network via the A77(T), A75(T) and B738 for construction traffic and turbine deliveries;
- The Site has good internal access through existing farm tracks which limit the need for new infrastructure and additional land-take;
- The Site is at distance from main settlements with the closest being the village of Leswalt approximately 4 km to the east. The distance to nearby properties, the closest of which is approximately 1 km from the nearest turbine, means that unacceptable noise and overbearing residential visual amenity impacts can be avoided; and
- There is a feasible local grid connection.

3.2 Design Process

3.2.1 There have been major technological advances in turbine design since the Consented Larbrax Wind Farm received planning permission in 2016. As such, between 2016-2024 a number of efforts have been made by the Applicant to make the project both technically and commercially viable.

3.2.2 The aim of the design strategy has been to revisit the Consented Larbrax Wind Farm and re-design a layout which seeks to maximise potential renewable energy generation and biodiversity enhancement opportunities within the technical and environmental constraints of the Site, whilst not increasing the significance of the environmental effects that were previously identified but considered to be acceptable in planning terms. Key to the design strategy has been the consideration of the impacts on landscape and visual amenity which resulted in the original refusal of the Consented Larbrax Wind Farm, and how these same issues could be minimised as far as possible.

3.2.3 The starting point for the re-design process was therefore led by landscape and visual impact considerations, including landform and scale, and to what extent the landscape is capable of accommodating larger but fewer turbines. The landscape and visual factors influence how the Proposed Development will be perceived by people within the surrounding area.

3.2.4 Based on a review of the Site and its landscape context, identified environmental constraints, the Site's previous planning history/reasons for the original refusal, and advice contained in good practice guidance including NatureScot's Siting and Designing Wind Farms in the Landscape, the following site-specific design principles were adopted and considered throughout the design process:

- Arrange turbines as far as possible to form an evenly spaced group or array within minimal stacking when seen from key scenic viewpoints and routes on the peninsula, such as from Killantringan Lighthouse, the Southern

Upland Way (SUW), the A77, A718 and B738 and views from the sea such as from the Cairnryan to Belfast ferry route;

- Achieve operational noise limits including when operating alongside other smaller single turbines in the area;
- Limit the potential effects on the special landscape qualities of the Rhins RSA as far as possible;
- Use intervening landform to limit visibility to localised areas across the peninsula whilst not materially increasing visibility compared to the Consented Larbrax Wind Farm;
- Develop a well composed layout in views from key cultural heritage assets in the wider area where theoretical intervisibility is possible including Agnew Monument (SM 2001) (LB 10115);
- Seek to avoid peat deposits over 0.5 m wherever possible for turbines and infrastructure;
- Avoid unacceptable peat slide risk;
- Develop a layout which is compatible with current farming practices on the Site and minimises the sterilisation of farm land;
- Seek to improve the infrastructure layout from the Consented Larbrax Wind Farm as far as possible, such as minimising the need for new track and upgrading existing track wherever possible;
- Design a layout which minimises visibility from nearby settlements and areas including Leswalt, Portpatrick, Stranraer and Loch Ryan to the east by using intervening and undulating landform as screening;
- Limit the loss of forestry within the Site by avoiding scattered shelter belts thereby also reducing operational effects on bats; and
- Minimise watercourse crossings.

- 3.2.5 The final design of the Proposed Development (see **Figure 2**) is the outcome of an iterative process which has aimed to balance achieving the maximum energy yield possible for the Site whilst also minimising potential effects on the environment.
- 3.2.6 Further details can be found in **Chapter 3: Site Selection and Design Strategy** of the EIA Report and the **Design and Access Statement**.

4. Landscape and Visual Impact Assessment

4.1 Introduction

- 4.1.1 The Landscape and Visual Impact Assessment (LVIA) assesses the likely significant effects of the Proposed Development during construction and operation (including cumulatively with other wind farms) on the landscape (landscape character and designations) and visual resources (viewpoints, settlements and routes) of the Site and the surrounding study area (40 km from outermost turbines). The assessment focuses on locations within the study area where receptors are likely to be affected by the Proposed Development as predicted by a Zone of Theoretical Visibility (ZTV) map, which shows areas from where the Proposed Development may be seen and the extent of the visibility (see **Image 5**). A separate Residential Visual Amenity Assessment (RVAA) has also been undertaken to describe the change in views likely to be experienced by residential properties within 2.5 km from where there is high visibility of the turbines. The purpose of the RVAA is to assess whether there will be an effect on living conditions or residential amenity.
- 4.1.2 Landscape character and resources are considered to be of importance in their own right and are valued regardless of whether they are seen by people. Effects on views and visual amenity as perceived by people are clearly distinguished from, although closely linked to, effects on landscape character and resources.
- 4.1.3 The full assessment can be found in **Chapter 5: Landscape and Visual Impact Assessment** of the EIA Report which is accompanied by appendices, figures and viewpoint visualisations.

4.2 Overview of Methodology

- 4.2.1 The assessment was informed by desk-based research, consultation with NatureScot and Dumfries and Galloway Council (DGC), fieldwork, photography and visualisations prepared for 18 assessment viewpoints. The assessment methodology has followed best practice guidance developed by NatureScot and the Landscape Institute (LI).

4.3 Overview of Baseline Conditions

- 4.4 Much of the LVIA study area comprises the Rhins of Galloway peninsula. The landscape character of the study area is therefore largely defined by the peninsula that hosts the Site (Landscape Character Type (LCT) 156), comprising rocky and rugged coastal edges.
- 4.5 There are no nationally designated landscapes such as National Scenic Areas (NSAs) within the study area. The Site does, however, sit within the Rhins Coast Regional Scenic Area (RSA). This is a local level landscape designation in Dumfries and Galloway. There are no other local level landscape designations within 20 km of the Site. Lochnaw Castle Garden and Designed Landscape (GDL00407) is located approximately 2.5 km to the north-east of the Site. The GDL is not publicly accessible and is privately owned. It is valued for its architecture and walled garden designed by the Scottish Landscape Architect John Hay.
- 4.6 The closest settlements are Leswalt, approximately 4 km to the east of the nearest turbine, Portpatrick, approximately 7.5 km to the south, Stranraer approximately 8.6 km to the east and Kirkcolm, approximately 10 km north-east, however due to intervening landform potential visibility from these settlements is limited. There are no single properties within the Site, but properties are located within the surrounding area and are mainly single rural dwellings farmhouses and holiday cottages. The closest properties to the Site include Greenburn, Meikle Galdenoch and Galdenoch Mill Cottage (north-east), Larbrax Lodge (east), Larbrax Cottages and Meikle Larbrax (south).
- 4.7 Key roads within 20 km which provide strategic access across the study area include the A77, A618, A75, A751 and the A716. In addition, key recreational routes within 20 km include the Southern Upland Way, Rhins of Galloway Coastal Path, Loch Ryan Coastal Path/Mull of Galloway Trail, Ayrshire Coastal Path and National Cycle Network 73, as well as numerous core paths.
- 4.8 The closest operational wind farm to the Site is North Rhins Wind Farm which comprises 11 turbines at 100 m to tip. This is the only commercial scale wind farm on the peninsula. The next closest is Glen App Wind Farm in South Ayrshire, approximately 16 km to the north-east and which comprises 11 turbines at 126.5 m to tip. There are several smaller clusters or single operational turbines within 5 km of the Site, including Knocknain Farm (one turbine at 53.7 m to tip) and Glenhead of Aldouran (one turbine at 46.5 m to tip).

4.9 Assessment of Effects

Landscape Effects

- 4.9.1 **Significant (Major)** effects on landscape character and resource during construction is likely to occur for the host LCT (LCT 156: Peninsula) within the Site as a result of the large scale of change to the existing baseline.
- 4.9.2 **Significant (Major)** operational effects on landscape resource within the Site is likely, as are effects on LCT 156: Peninsula within approximately 4 km of the north and south of the Site which will reduce to **Significant (Moderate)** within approximately 7 km. These localised effects on landscape character, which also extend to within the Rhins Coast RSA, are not judged to compromise the overall integrity of the Rhins Coast RSA.

Visual Effects

- 4.9.3 **Significant** operational visual effects are predicted from 11 of the 18 LVIA viewpoints assessed and three recreational routes (see below). The majority of significant visual effects are contained within 5 km, representing closer proximity and more open views to the north, east and south of the Site.

Viewpoints

- 4.9.1 **Major (Significant)** effects are predicted from:
- Viewpoint 1: Core Path, west of Meikle Galdenoch;
 - Viewpoint 2: Core Path, Larbrax Moor;
 - Viewpoint 3: Meikle Galdenoch, near Parking Area;
 - Viewpoint 4: B738, near Lochlaw Cottage; and
 - Viewpoint 11 – Parking Area, near Killantringan Lighthouse.
- 4.9.2 **Moderate (Significant)** effects are predicted from:
- Viewpoint 5 – B738, near Meikle Galdenoch;
 - Viewpoint 6 – Agnew Monument;
 - Viewpoint 8 – Slewdown Hill;
 - Viewpoint 9 – High Aucheneel;
 - Viewpoint 12 – South Cairn; and
 - Viewpoint 16 – Stranraer to Belfast Ferry.

Routes

- 4.9.3 **Major to Moderate** effects are predicted from:
- Southern Upland Way: within 7 km from sections with visibility; and
 - Rhins of Galloway Coastal Path: within 7 km from sections with visibility;
- 4.9.4 **Major** effects are predicted from:
- Core Paths within 5 km: This may extend up to 7 km from Core Paths along the coastal edge, where direct views towards the Proposed Development are available.

Residential Properties

- 4.9.5 Nine properties with a high degree of visibility of the turbines are assessed in the RVAA. Whilst significant visual effects may occur at these properties, it is not considered that these effects will affect living conditions or residential amenity.

Cumulative Effects

- 4.9.6 In an alternative theoretical future cumulative baseline, which includes operational, consented and proposed wind farms, the Proposed Development will increase the influence of wind farm development on the Rhins Peninsula. However, the Proposed Development will generally read as a distinct scheme due to the separation between it and the operational North Rhins Wind Farm, and difference in scale between the Proposed Development and some of the operational and proposed smaller scale turbines in closer proximity on the Rhins. The effects identified in the cumulative assessment will reflect those identified in the primary assessment (which considers operational and under construction wind farms as part of the baseline).

4.10 Proposed Additional Mitigation/Enhancement

- 4.10.1 No committed mitigation measures are proposed in addition to those which have been embedded into the design of the Proposed Development.

4.11 Summary of Likely Significant Residual Effects

- 4.11.1 As all mitigation for landscape and visual effects is embedded within the final design for the Proposed Development, all effects identified are residual effects.

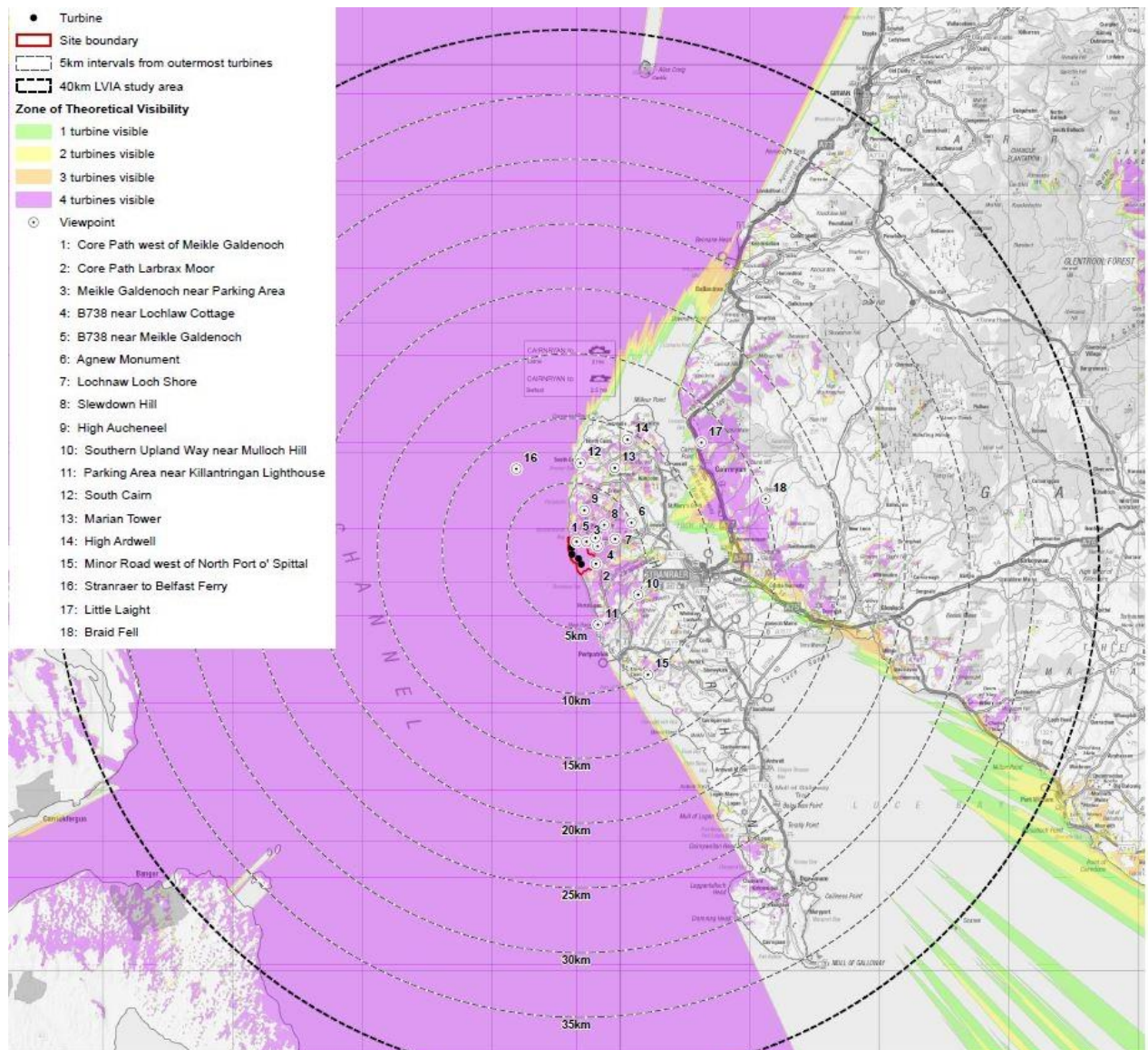


Image 5: Zone of Theoretical Visibility and Viewpoint Locations

5. Cultural Heritage

5.1 Introduction

- 5.1.1 The cultural heritage assessment considers the potential direct and indirect physical impacts related to construction of the Proposed Development on heritage assets within the Site, and operational impacts on the setting¹ of heritage assets within 10 km where there is theoretical visibility of the Proposed Development from these assets (including cumulatively with other wind farms).
- 5.1.2 Cultural heritage assets include Sites, features and areas with statutory and non-statutory designations, including Scheduled Monuments; Listed Buildings; Conservation Areas; Gardens and Designated Landscapes (GDL) (Inventory and Non-Inventory Status); Non-Statutory Register Sites and other historic environment interests.
- 5.1.3 The full assessment can be found in **Chapter 5: Cultural Heritage** of the EIA Report which is accompanied by appendices, figures and visualisations.

5.2 Overview of Methodology

- 5.2.1 The assessment was informed by desk-study including consultation with Historic Environment Scotland (HES) and Dumfries and Galloway Council Archaeology Service (DGCAS), a review of information sources such as the Dumfries and Galloway Historic Environment Record (HER) and a review of the findings from the previous field work and assessment undertaken for the Consented Labrax Wind Farm. The assessment has followed best practice guidance.

5.3 Overview of Baseline Conditions

- 5.3.1 There are four Scheduled Monuments within the Site which are designated as having heritage value at the national level and therefore of high sensitivity. In addition, there are 17 non-designated assets also within the site – see **Image 6**. All of these assets are of low to no heritage value except one (Loch More, burnt mound (Asset 2)) which is of regional value. Taking account of the little change in land-use as unimproved pasture and the character of the identified cultural heritage baseline within the Site, the results of the study suggests that there is moderate potential for undiscovered assets to have survived within the Site.
- 5.3.2 Within 10 km of the Proposed Development turbines there are:
- 31 Scheduled Monuments, of high sensitivity (20 with predicted visibility of the Proposed Development);
 - One Inventory Garden and Designed Landscape (GDL), of high sensitivity (with predicted visibility of the Proposed Development);
 - Five Category A Listed Buildings, of high sensitivity (two with predicted visibility of the Proposed Development);
 - 66 Category B Listed Buildings, of medium sensitivity (eight with predicted visibility of the Proposed Development); and
 - Two Conservation Areas, of medium sensitivity (one with some marginal predicted visibility of the Proposed Development).

5.4 Assessment of Effects

- 5.4.1 One potential **Major (Significant)** effect on Asset 2 has been identified as a result of the construction of the Proposed Development. Should the 100 m micro-siting allowance be implemented, there is potential that this asset could be disturbed from track and borrow pit construction as it lies within 80 m of this infrastructure. All other identified heritage assets (including the four Scheduled Monuments) are sufficiently distanced from the Proposed Development such that no direct adverse effects are predicted. In addition, without mitigation in place, there is potential that ground breaking activities could disturb or destroy unrecorded features of cultural heritage interest within the Site which could result in a **Major (Significant)** effect on these assets.

¹ Setting relates to the surroundings in which an asset is experienced.

- 5.4.2 In terms of setting effects on assets within 10 km, the assessment has focussed on 13 assets from where there is potential visibility of the Proposed Development turbines and whose settings within the landscape form important part of their heritage value. The assessment has identified that effects on setting will be no more than **minor (not significant)** for these assets as a result of limited or no visibility of the Proposed Development.

5.5 Proposed Additional Mitigation/Enhancement

- 5.5.1 It is proposed that Asset 2 will be marked off and avoided during construction works such that no direct physical impacts will occur.
- 5.5.2 Taking account of the moderate probability of encountering undisturbed buried archaeological remains within the Site, an archaeological watching brief will be implemented during all ground disturbance works and overseen by an Archaeological Clerk of Works (ACoW). The scope of the watching brief will be agreed through consultation with Dumfries and Galloway Council in advance of development works commencing and will be set out in a Written Scheme(s) of Investigation (WSI). If significant discoveries are made during any archaeological monitoring works, and it is not possible to preserve the discovered site or features by leaving them in place, provision will be made for the excavation where necessary of any archaeological remains encountered. The provision will include the subsequent production of written reports on the findings, with post-excavation analysis conservation of finds and publication of the results of the works, where appropriate.

5.6 Summary of Likely Significant Residual Effects

- 5.6.1 With the above mitigation in place, no significant residual effects are predicted for Asset 2 or previously undiscovered heritage assets during construction, with these effects reducing to **negligible (not significant)** and **minor (not significant)** respectively.

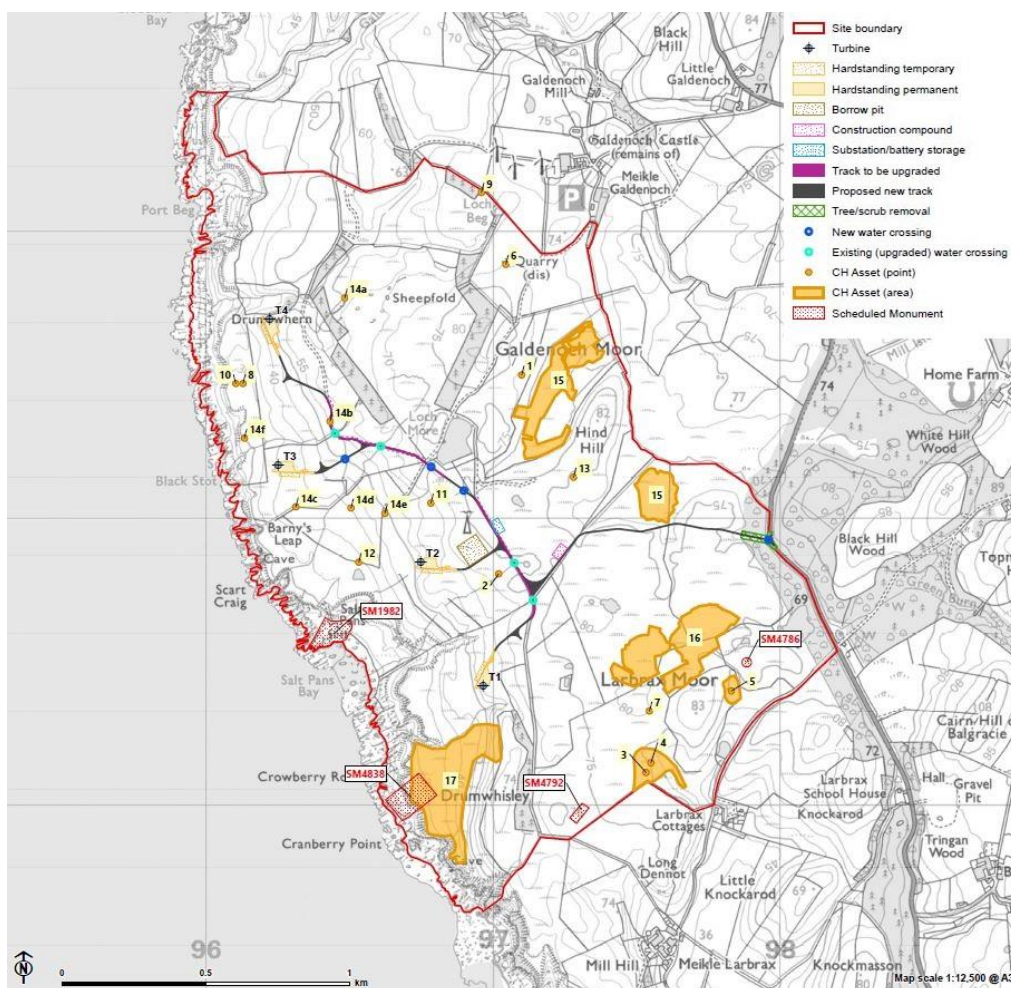


Image 6: Known heritage assets within the Site

6. Ecology

6.1 Introduction

- 6.1.1 The ecology assessment considers the potential significant effects of the construction and operation (including cumulatively with other wind farms) of the Proposed Development on protected species, bats, habitats of conservation value and designated sites within 5 km.
- 6.1.2 The full assessment can be found in **Chapter 7: Ecology** of the EIA Report which is accompanied by appendices and figures.

6.2 Overview of Methodology

- 6.2.1 Extensive desk-based studies and field surveys have been carried out within and around the Proposed Development Site over respective study areas to establish baseline conditions and the species and populations present. Surveys included a site walkover to determine the presence of otter, badger, water vole, pine marten, red squirrel and reptiles, habitat surveys to determine the conservation value of baseline habitat (including potential groundwater dependent terrestrial habitats (GWDTE)), bat roost checks of trees within the Site and bat activity surveys. Consultation was undertaken with NatureScot to determine the scope of proposed surveys, and to confirm the validity of previous surveys undertaken for the Consented Larbrax Wind Farm.
- 6.2.2 The assessment has been undertaken using best practice guidance by NatureScot and the Chartered Institute of Ecology and Environmental management (CIEEM).

6.3 Overview of Baseline Conditions

- 6.3.1 Salt Pans Bay Site of Special Scientific Interest (SSSI) lies within the south-western part of the Site and is designated for rare coastal heath habitat which supports locally and nationally scarce plant species.
- 6.3.2 Baseline habitat surveys indicated that improved grassland, semi-improved acid grassland, and marshy grassland make up over half of the Site (see **Image 7**), with blanket bog and wet modified bog covering around 10% of the Site. Several other habitat types such as heaths, modified bog, bracken, woodlands and coastal habitats are present, but each respectively cover relatively small areas. Blanket bog and wet modified bog was taken forward for detailed assessment based on its higher nature conservation value.
- 6.3.3 Baseline surveys have established the Site is used by badgers, bats, common lizard and brown hare. There are historical records of otter using the Site, however more recent surveys in 2021 and 2023 did not record any evidence of otter. No other protected species have been recorded at the Site, and the watercourses are generally unsuitable for fish. The risk to all species, including high collision risk bat species, is considered to be low based on the levels and distribution of species activity recorded.

6.4 Assessment of Effects

- 6.4.1 In addition to embedded design mitigation already proposed, several good practice mitigation measures will be used to minimise effects on ecology pre-construction, during construction and during operation. A suitably qualified Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction to advise the Applicant and the Contractor on all ecological matters. The ECoW will be required to be present onsite during the construction phase and will carry out monitoring of works. A Species Protection Plan (SPP) will be implemented during the construction phase. The SPP will detail measures to safeguard protected species known or likely to be in the area. The SPP will include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new protected species or features in the vicinity of the construction works. The Proposed Development will also utilise the method of reduced rotation speed whilst idling by feathering, at all wind turbines, to reduce collision risks to bats during the bat active period (April to October).
- 6.4.2 It was possible to scope out the effects on a number of habitats and species by virtue of their ecology, absence, distance from the Proposed Development, low levels of activity, the nature and location of this activity and the implementation of the above noted good practice measures. As such, the assessment focusses on the construction and operational effects on blanket bog and wet modified bog habitat and has found that, on the basis of the good

practice mitigation measures being implemented, the direct habitat loss and potential indirect loss/modification effect will be **Minor (not significant)**.

- 6.4.3 As noted in **Section 2**, there are proposals for enhancing the biodiversity value of the Site as part of the Biodiversity Enhancement Management Plan (BEMP). This will include the restoration and enhancement of at least 13 ha of degraded blanket bog/wet modified bog into better condition which will result in a **Moderate (significant)** positive effect.

6.5 Proposed Additional Mitigation/Enhancement

- 6.5.1 No additional mitigation or enhancement is proposed beyond the good practice measures noted above and the restoration/enhancement proposals within the BEMP.

6.6 Summary of Likely Significant Residual Effects

- 6.6.1 The only significant residual effect will be in relation to blanket bog and wet modified bog restoration during operation (**Moderate positive**).



Image 7: Typical Pasture Grassland across Most of the Site

7. Ornithology

7.1 Introduction

- 7.1.1 The ornithology (birds) assessment considers the potential significant effects of the Proposed Development on birds of nature conservation importance at a regional level during construction and operation (including cumulatively with other wind farms). Effects assessed are habitat loss, disturbance/displacement and direct mortality from collision risk.
- 7.1.2 The full assessment can be found in **Chapter 8: Ornithology** of the EIA Report which is accompanied by appendices and figures.

7.2 Overview of Methodology

- 7.2.1 Baseline conditions to inform the design and assessment of the Proposed Development were established through a desk study including consultation with NatureScot to agree the scope of surveys, a review of bird records such as those available from the Dumfries and Galloway Raptor Study Group, review of designated sites for bird conservation interests within 20 km, and ornithological field surveys in accordance with industry standard guidance. Baseline surveys were undertaken between May and August 2021 and included flight activity surveys, scarce breeding bird (raptor) surveys, black grouse surveys, breeding bird (wader) surveys and winter walkover surveys up to 2 km from the Site. The findings of these surveys supplemented earlier surveys undertaken for the Consented Larbrax Wind Farm.
- 7.2.2 The assessment has been undertaken using best practice guidance by NatureScot.

7.3 Overview of Baseline Conditions

- 7.3.1 The Site does not form part of any statutory designated site for nature conservation with qualifying ornithological interests. Loch of Inch and Torrs Warren SPA (underpinned by White Loch – Lochinch SSSI, Torrs Warren – Luce Sands SSSI and Loch of Inch and Torrs Warren Ramsar) is approximately 13.3 km south-east from the Site and designated for non-breeding Greenland white-fronted goose and hen harrier. White Loch – Lochinch SSSI is also designated for non-breeding greylag goose. Glen App and Galloway Moors SPA (underpinned by Glen App and Galloway Moors SSSI) is approximately 12.1 km north-east from the Site and designated for breeding hen harrier. Given the distances of these designations to the Site and the foraging distance of the birds they support (2 km for hen harrier and 5-8 km for greylag goose), there is no potential for connectivity with the Site.
- 7.3.2 Baseline surveys recorded low activity of raptors and owls (hen harrier, merlin, peregrine falcon, barn owl and short-eared owl), herring gull, greylag goose and whooper swan. Curlew and lapwing were both identified to be breeding on the Site (albeit in relatively low numbers – see **Image 8**), with dunlin, golden plover and whimbrel infrequently recorded. Overall, ornithological activity at the Site was relatively low, with the species present typical of the lowland habitats present on the Site.

7.4 Assessment of Effects

- 7.4.1 In addition to embedded design mitigation already proposed, good practice mitigation measures will be used to minimise effects on birds during construction and operation. The Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) who will advise the Applicant and the Contractor on all ornithological matters (with the assistance of a suitably qualified/licenced ornithologist if required). The ECOW will be required to be present onsite during the construction period and will carry out monitoring of works and briefings with regards to any ornithological sensitivities on the Site to the relevant staff working on the Site. In addition, a Bird Disturbance Management Plan (BDMP) will be implemented during construction of the Proposed Development and will form part of the Construction Environmental Management Plan (CEMP). The BDMP will detail measures to ensure legal compliance and safeguard breeding birds known to be in the area and will include species-specific guidance. The BDMP shall include pre-construction surveys and good practice measures during construction. Pre-construction surveys will be undertaken to check for any new breeding bird activity in the vicinity of the construction works.
- 7.4.2 It was possible to 'scope out' most recorded ornithological features from detailed assessment, including all designated sites, by virtue of their distance from the Proposed Development, small numbers, low levels of activity, low collision risk, the nature and location of this activity and the implementation of the proposed good practice

measures. Cumulative effects are also scoped out on the basis of there being no other wind farms within the region which could have a cumulative effect with the Proposed Development on birds. As a result, only curlew and lapwing are taken forward to detailed assessment due to their breeding status within the Site and flight activity.

- 7.4.3 Assuming the good practice mitigation measures are implemented, the assessment found that effects on the regional populations of curlew and lapwing will be at most **Minor (not significant)** in relation to habitat loss, disturbance/displacement and collision risk.

7.5 Proposed Additional Mitigation/Enhancement

- 7.5.1 No additional mitigation or enhancement is proposed beyond the good practice measures noted above.

7.6 Summary of Likely Significant Residual Effects

- 7.6.1 No likely significant residual effects have been identified in relation to ornithology.

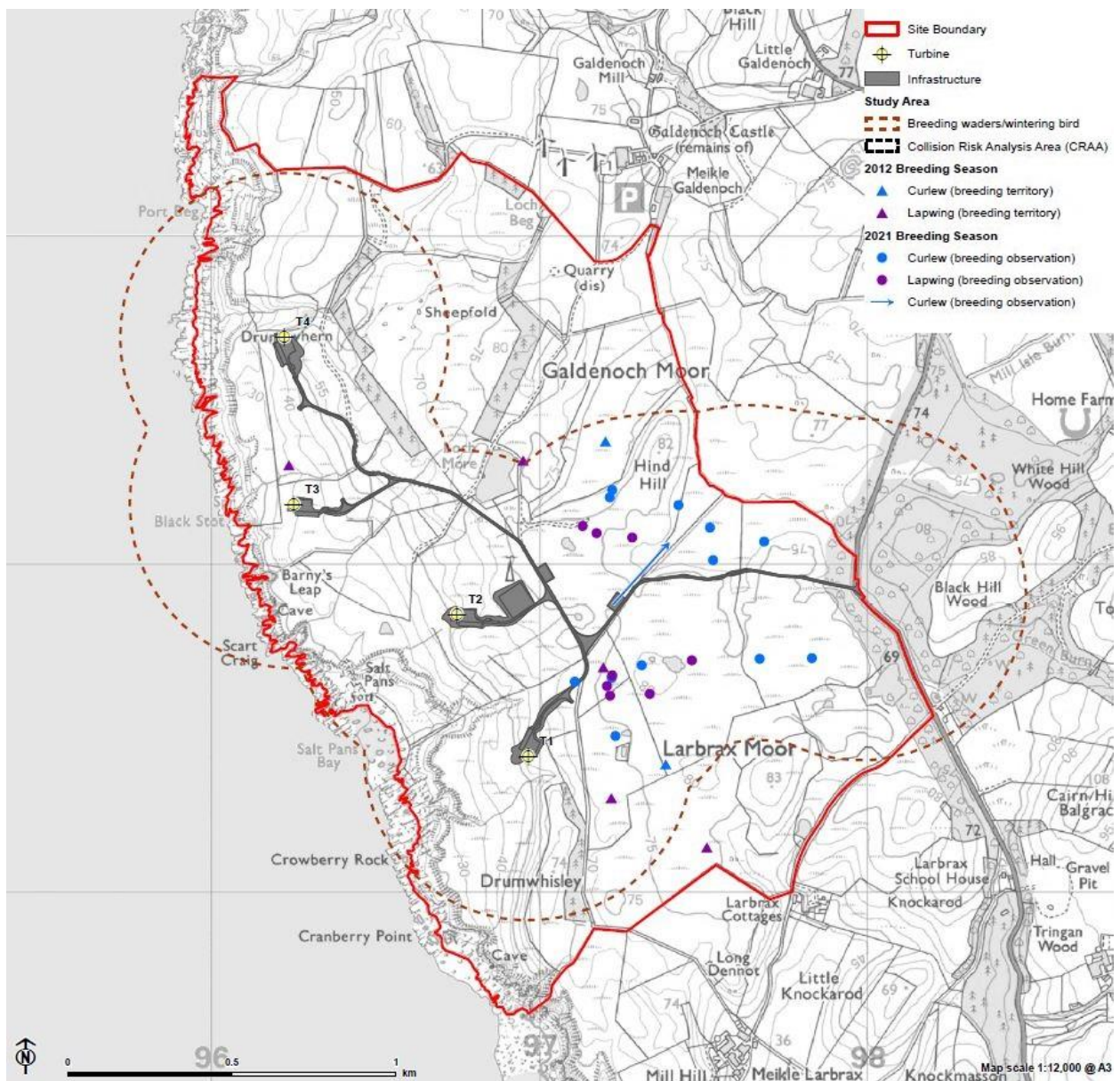


Image 8: Curlew and Lapwing Observations

8. Hydrology, Hydrogeology, Geology and Peat

8.1 Introduction

- 8.1.1 The hydrology, hydrogeology, geology and peat assessment considers the potential effects of the Proposed Development during construction and operation on groundwater and surface water quality, flood risk and drainage, private water supplies (PWS), peat disturbance and Ground Water Dependent Terrestrial Ecosystems (GWDTEs). The assessment has considered potential effects at a water catchment level as beyond this no effects are likely.
- 8.1.2 The full assessment can be found in **Chapter 9: Hydrology, Hydrogeology, Geology and Peat** of the EIA Report which is accompanied by appendices and figures.

8.2 Overview of Methodology

- 8.2.1 Desk-based studies and field surveys were carried out to establish baseline conditions. The desk-based sources included SEPA flood mapping, water classification and licensed abstraction data, NatureScot carbon and peatland mapping, British Geological Survey mapping and private water supply (PWS) data from Dumfries and Galloway Council (supplemented by information obtained via questionnaires from local residents). Surveys undertaken to inform the assessment included extensive peat depth surveys, GWDTE survey, PWS survey and hydrology walkover to review watercourse crossing locations.

8.3 Overview of Baseline Conditions

- 8.3.1 The eastern part of the Site is within the catchment of the Green Burn, with the majority of the Site draining via small unnamed watercourses to the west to the sea (North Channel).
- 8.3.2 SEPA flood mapping indicates there is a likelihood of flooding within the Site boundary associated with the Green Burn. Detailed hydraulic modelling mapped the flood risk areas in more detail to inform the design of the Site access from the B738. The Proposed Development is sited outwith (with the exception of the site access and 30 m of access track) the predicted 200-year plus climate change flood risk area associated with the Green Burn.
- 8.3.3 The surface water quality of Green Burn is classified by SEPA as Moderate and the other watercourses within the Site are not classified. The Salt Pans Bay Site of Special Scientific Interest (SSSI) is located within the south-western part of the Site along the coastal edge and is designated for rare maritime cliff habitat. There is no development proposed within the SSSI.
- 8.3.4 Based on council data, questionnaire responses, and direct consultation with residents, it was found that there are no PWS sources within the Site boundary and six properties which rely on a PWS within 1 km of the Site boundary. Further analysis determined that there are no PWS sources within 450 m of proposed infrastructure and there is no hydrological connectivity such that an effect on sources is not likely.
- 8.3.5 Areas of potential GWDTEs (habitats which are reliant on groundwater and protected by the Water Framework Directive) were identified during the ecology habitat surveys. Two GWDTEs were identified on the Site and avoided where possible.
- 8.3.6 The majority of the peat present in the Site was on Galdenoch Moor and on Larbrax Moor. There was limited peat found in the western part of the Site. Approximately 86% of the peat depth probes recorded depths of less than 0.5 m (indicating no peat present). The remaining 14% of probes recorded depths of more than 0.5 m (indicating the presence of peat). Deeper peat was avoided as far as possible through the design. The peat probing surveys informed the preparation of the Outline Peat Management Plan (OPMP) and peat slide hazard risk assessment (PLHRA).

8.4 Assessment of Effects

- 8.4.1 The assessment of effects considers the embedded design mitigation proposed as well as a suite of good practice mitigation measures which reflect best practice guidance and recognised industry standards which will be implemented through the Construction Environmental Management Plan (CEMP).
- 8.4.2 On the basis of the desk-based and field survey work undertaken, potential effects on solid geology, PWS and cumulative effects are 'scoped out' of detailed assessment.

- 8.4.3 With the embedded design mitigation and proposed good practice measures in place, there are **no significant** (**moderate** or **major**) effects predicted in relation to surface water and groundwater quality, flood risk, GWDTEs and peat disturbance, with all effects being assessed as either **none**, **negligible** or **minor**. All excavated peat during construction will be fully re-used within the Site through reinstatement of working areas.

8.5 Proposed Additional Mitigation/Enhancement

- 8.5.1 Additional pollution control measures (e.g. silt fences, settlement ponds) will be installed at watercourse crossings and three locations where a 50 m buffer from watercourses cannot be achieved due to other design constraints. This will reduce the risk of sediment/silt runoff to the water environment. In addition, no construction materials will be placed within the flood risk area of the Green Burn during construction of the access track, and the contractor will sign up to SEPA's flood warning service and follow weather forecasts and warning in order to receive advance warning of flood events. Construction work of the access track crossing will cease during flood events.
- 8.5.2 Any excavated peat will be stored appropriately nearby and re-used as soon as possible for reinstatement purposes. Minimisation of peat landslide risk will be achieved through careful construction management. An ECoW will be on site throughout the construction to monitor the effectiveness of the embedded, good practice and additional mitigation measures.

8.6 Summary of Likely Significant Residual Effects

- 8.6.1 No likely significant residual effects have been identified in relation to hydrology, hydrogeology, geology and peat.



Image 9: Green Burn flowing along eastern Site Boundary, Looking Upstream

9. Noise and Vibration

9.1 Introduction

- 9.1.1 The noise assessment considers the potential noise effects during construction and operation (including cumulatively with other wind farms) of the Proposed Development for the closest residential properties.
- 9.1.2 The full assessment can be found in **Chapter 10: Noise and Vibration** of the EIA Report which is accompanied by appendices and figures.

9.2 Overview of Methodology

- 9.2.1 The assessment has been informed by desk-based research, consultation and field survey. A background noise survey was carried out at four residential properties (Noise Monitoring Locations – NMLs) between November 2021 and January 2022. The purpose of the survey was to establish existing day-time and night-time noise levels in the area for a wide range of wind speeds. Background noise levels at these selected properties are considered to be representative of noise levels at the additional 12 properties assessed for operational noise (Noise Assessment Locations – NALs).
- 9.2.2 The construction noise assessment has predicted noise levels from onsite construction works at four of the closest residential properties (Construction Noise Assessment Locations – CNALs) and compared these values to applicable thresholds set by guidance to determine if effects are likely to be significant or not.
- 9.2.3 The operational noise assessment has established the total noise limits in accordance with best practice guidance at sixteen properties (or NALs) – see **Image 10**. Noise modelling has been undertaken to determine if noise predictions from the Proposed Development on its own are within 10 decibels (dB) of noise predictions from other wind turbines in the area. If so, a cumulative assessment has been undertaken. If not, then the property has been scoped out as it is expected that noise at this property will be within the acceptable limits. For the properties (NALs) assessed, site specific noise limits (SSNLs) were determined for the Proposed Development by removing the cumulative noise predictions from the total noise limits as all wind turbines operating together need to operate within the total noise limits. The Proposed Development was then assessed against its own SSNLs for each property (NAL) to determine if it will comply with these limits. Any exceedance of the SSNLs will mean that the Proposed Development cannot comply with the total noise limits when operating alongside other wind turbines. Like construction noise, non-compliance with operational noise limits will mean a significant effect.
- 9.2.4 The assessment methodology has followed the latest best practice guidance in relation to the assessment of noise from construction sites and operational wind farms.

9.3 Overview of Baseline Conditions

- 9.3.1 The Proposed Development is located within a rural location where existing background noise levels at the noise sensitive receptors are generally considered to be low. The predominant noise sources in the area include wind induced noise (wind passing through vegetation and around buildings), sea noise, local watercourses, agricultural noise and birdsong.
- 9.3.2 There are a number of single turbines within the surrounding area including Knocknain, High Mark, High Auchneel, Auchnotteroch and Glaik Hill which were modelled in the assessment – see **Image 10**.

9.4 Assessment of Effects

- 9.4.1 The assessment of construction noise effects has been undertaken on the basis of good practice measures being implemented to minimise noise impacts, and these will be secured through the project CEMP. These measures will include keeping residents informed of working schedules, ensuring no works are undertaken between 7pm and 7am (with the exception of abnormal load deliveries which are dictated by Police availability and generally scheduled to avoid peak traffic), ensuring vehicles are fitted with exhaust silencers, shutting down machines between work periods and operating machinery efficiently. The operational noise assessment is undertaken on the basis of the embedded design mitigation. Throughout the design, the Proposed Development was reviewed to optimise wind turbine numbers and locations to ensure noise limits could be met.

- 9.4.2 Predictions for construction noise activities at the closest residential properties (or CNALs) indicate that construction noise impacts will be temporary and **not significant**.
- 9.4.3 Predicted operational noise levels from the Proposed Development indicate that wind turbine noise from the Proposed Development will meet the SSNLs at all properties, therefore; the Proposed Development is able to operate within the total limits with other nearby turbines and the operational noise effects are deemed to be **not significant**.

9.5 Proposed Additional Mitigation/Enhancement

- 9.5.1 No additional mitigation is proposed over and above the embedded design mitigation measures and good practice.
- 9.5.2 The use of SSNLs will ensure that the Proposed Development can operate concurrently with other operational wind farm developments in the area and will also ensure that its individual contribution to total noise limits can be measured and enforced if required.

9.6 Summary of Likely Significant Residual Effects

- 9.6.1 There are **no significant** residual construction and operational (including cumulative) effects associated with the Proposed Development.

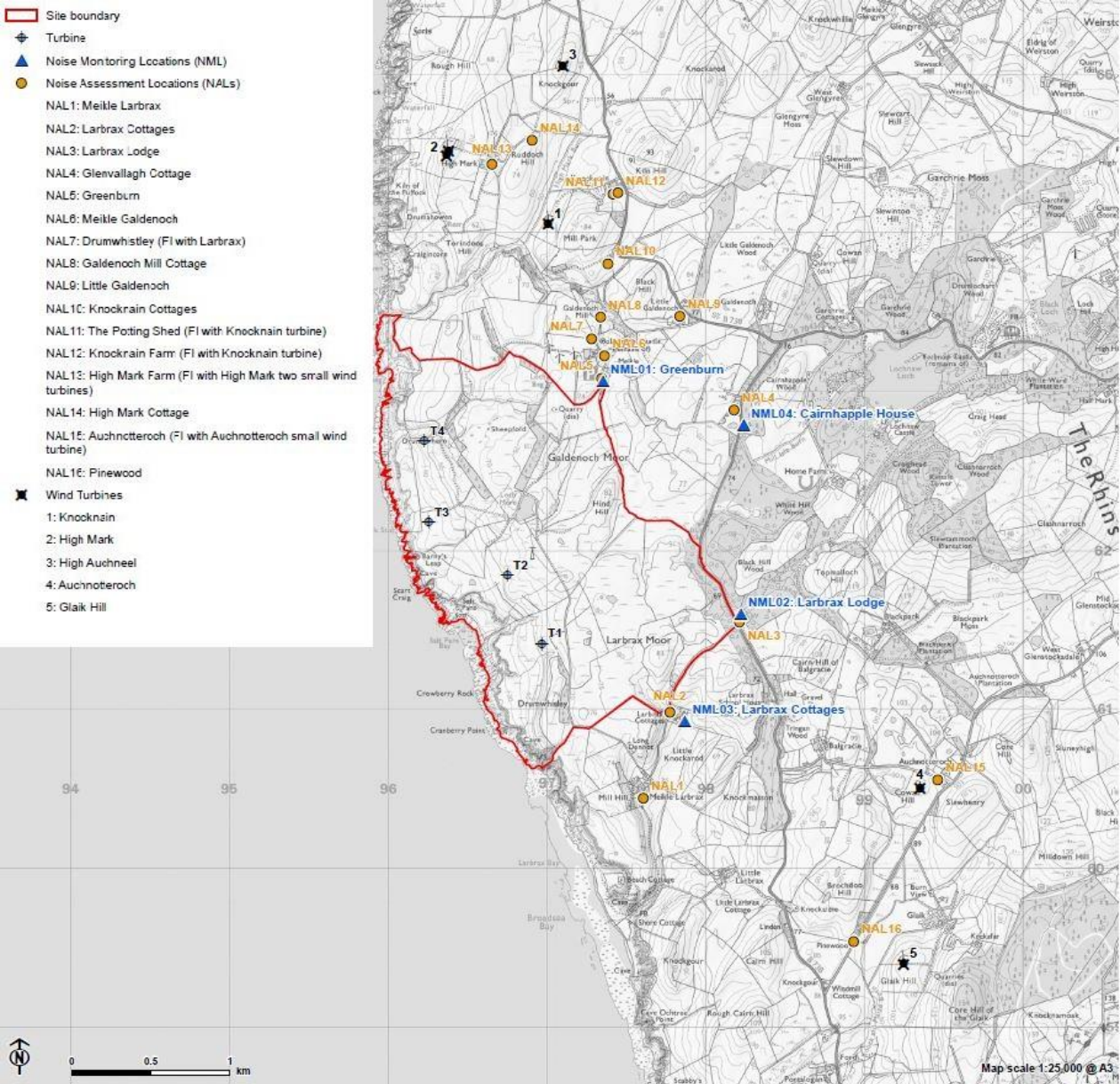


Image 10: Properties Assessed for Operational Noise and Cumulative Turbines

10. Access, Traffic and Transport

10.1 Introduction

- 10.1.1 The access, traffic and transport assessment considers the potential effects of the Proposed Development during the construction phase associated with the increase in traffic volumes and AIL movements on the roads which are expected to be used, including the A77, A75, A751 and B738 (i.e. the study area). Effects assessed include severance, pedestrian delay, driver delay, fear and intimidation, non-motorised user amenity, large loads and road safety.
- 10.1.2 The operational phase is restricted to maintenance operations which generate significantly lower volumes of traffic which are not considered to be in excess of daily traffic variation levels on the existing road network. Operational effects have therefore not been assessed.
- 10.1.3 The full assessment can be found in **Chapter 11: Access, Traffic and Transport** of the EIA Report which is accompanied by appendices and figures.

10.2 Overview of Methodology

- 10.2.1 The assessment has been informed through desk-based study and field survey, including the collection of existing traffic flow information, review of personal injury accident data and review of cumulative developments within the surrounding area which could have overlapping construction timescales with the Proposed Development. Field survey comprised the collection of traffic data from Automatic Traffic Count (ATC) detectors for the B738 and the A77 at Lochans. Traffic data was also sourced for eight other locations within the study area from the Department for Transport (DfT) and Transport Scotland.
- 10.2.2 Sensitive receptors were identified within the study area such as users of the roads, residents along the roads, residents within settlements including those in Stranraer, Portpatrick, Lochans, Dunragit and Castle Kennedy.
- 10.2.3 Future baseline traffic predictions were made for each of the ten traffic count locations for the year 2028 (when construction is expected to commence) by factoring in growth projections and adding the estimated traffic generation from the Proposed Development. In accordance with good practice guidance, traffic count locations within the study area which were expected to experience more than a 30% increase in Heavy Good Vehicle (HGV) use or more than a 30% increase in total traffic volume were included in the assessment, as were sensitive areas where total traffic flows could increase by 10% or more.

10.3 Overview of Baseline Conditions

- 10.3.1 The Proposed Development will be accessed from the B738 on the eastern extents of the Site via a new junction located approximately 440 m north of the junction between the B738 and the access to Larbrax Lodge. The access junction will provide access to the Site for all AILs associated with the turbine deliveries, as well as access for heavy HGVs) delivering construction materials and general site traffic.
- 10.3.2 Construction traffic associated with the Proposed Development will approach from the south on the B738 via the A77 or A75, and all AIL traffic will access from the Port of Entry (POE) at Glasgow King George V Docks, utilising the proven AIL route used during the construction of other wind farms in the area.
- 10.3.3 There are limited pedestrian facilities in the immediate vicinity of the Proposed Development, reflecting the rural nature of the area. There are, however, a number of core paths and public rights of way in the immediate vicinity of and within the Site. The majority of the paths appear to be recreational in nature and do not appear to provide commuter / school traffic linkages to the surrounding settlements.
- 10.3.4 Traffic count data for the B738 (count location 1) recorded a total of 80 vehicles across a 24 hour period. This is low in comparison to the other A-roads within the study area, with the highest being 5,679 recorded in a 24 hour period for the A75 east of Stranraer (count location 9).
- 10.3.5 A total of 12 accidents were recorded within the study area roads within the three year period of January 2020 to December 2022. Of these 12 accidents, seven were classed as 'slight', four as 'serious' and one as 'fatal';

- 10.3.6 A review of consented developments was undertaken as part of the baseline assessment. No onshore wind farm developments or other significant traffic generating developments with planning permission were identified that should be considered as part of a cumulative assessment.

10.4 Assessment of Effects

- 10.4.1 The good practice guidance thresholds are exceeded at count location 1 (B738) and count location 2 (A77 at Craigenquarroch). The assessment therefore considers effects on B738 users and residents, A77 users and residents at Craigenquarroch and users of core paths within the Site.
- 10.4.2 The construction traffic will result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. The maximum traffic increase associated with construction of the Proposed Development is predicted to occur in month 7 of the 12 month construction programme. During this month, a total of 58 vehicle movements, comprising 38 two-way (i.e. a movement to and from the Site) HGV movements and 20 two-way car / LGV movements are predicted.
- 10.4.3 The assessment suggests that the following receptors are considered likely to experience **Significant (Major and Moderate)** effects in accordance with the EIA Regulations, prior to the application of mitigation measures:
- B738 users and residents – severance, driver delay, non-motorised user amenity, fear and intimidation, road safety and large loads;
 - A77 users and residents at Craigenquarroch (including approach to Portpatrick) – severance, fear and intimidation and large loads;
 - Core Path / Path Users within the Site and study area - pedestrian delay, non-motorised user amenity, fear and intimidation, road safety and large loads.
- 10.4.4 It should be noted that the impacts relate solely to the peak of construction activities i.e. worst-case month 7, and that the construction period is short lived and the effects are temporary in nature.

10.5 Proposed Additional Mitigation/Enhancement

- 10.5.1 The following measures will be implemented to mitigate the identified significant adverse effects of construction traffic during the construction phase, and these are proven methods to reduce disruption:
- Construction Traffic Management Plan (CTMP);
 - Abnormal Load Transport Management Plan;
 - Outdoor Access Management Plan; and
 - A Staff Travel Plan.

10.6 Summary of Likely Significant Residual Effects

- 10.6.1 With the implementation of appropriate mitigation, **no significant** residual effects are anticipated in respect of traffic and transport issues. The residual effects are all assessed to be **Minor**, and as they will occur during the construction phase only, they are temporary and reversible.

11. Climate Change

11.1 Introduction

- 11.1.1 The impacts of climate change are recognised as one of the world's greatest economic, environmental, and social issues. As a result, climate change is viewed as an essential concern in project assessment and decision-making, and is a key thread which runs through National Planning Framework (NPF) 4. The purpose of the Proposed Development is to generate electricity from a renewable source of energy, offsetting the need for electrical generation from the combustion of fossil fuels. As a result, the electricity generated and distributed by the Proposed Development will result in lower carbon dioxide (CO₂) emissions, with associated environmental benefit. However, no source of electricity generation is completely carbon free. For onshore wind, there will be emissions resulting from the manufacture of components and intermittent back up generation that is required in times of low wind resource, as well as emissions from both construction and decommissioning activities and transport.
- 11.1.2 The climate change assessment considers the potential effects of the Proposed Development on climate change in terms of carbon losses and savings (including carbon balance) and adaptation i.e. the ability of receptors, such as species and habitats, to adapt to a changing climate when the Proposed Development is operational.
- 11.1.3 The full assessment can be found in **Chapter 12: Climate Change** of the EIA Report which is accompanied by a carbon balance report (**Appendix 12.1**).

11.2 Overview of Methodology

- 11.2.1 The assessment has been informed by desk-based research, drawing largely from published guidance and data such as the UK Climate Change Projections (UKCP18) to determine the future climate baseline. In addition to this, a carbon balance assessment (see **Technical Appendix 12.1**) was undertaken to inform the climate change assessment. The carbon balance assessment was undertaken using the Scottish Government's methodology for calculating potential carbon losses and savings from wind farms on Scottish peatlands. The methodology involved the use of the Scottish Government's Carbon Calculator tool for wind farms on peat to assess the benefit of displacing electricity from fossil fuels with renewable generated electricity compared to the emissions of carbon required for the construction and operation of the Proposed Development over its 35-year lifetime. The outcome was the calculation of a payback period i.e. the time it will take for the Proposed Development to offset the estimated emissions it generates during construction and operation and become a 'net avoider' of emissions.
- 11.2.2 The assessment has been undertaken using the latest best practice IEMA guidance on assessing climate change effects.

11.3 Overview of Baseline Conditions

- 11.3.1 The assessment considers the projected changes in temperature, precipitation and wind speed and storms for the year 2060-2079, when the Proposed Development will reach the end of its lifetime. The projections highlight that summer and winter temperature are likely to be greater than the current baseline (greater summer), with winter temperature increasing and summer rainfall decreasing.

11.4 Assessment of Effects

- 11.4.1 Overall, the Proposed Development will be a net generator of greenhouse gas (GHG) emissions during construction as a result of manufacture and construction related emissions. A **Minor (Not Significant)** effect is predicted in relation to carbon emissions including CO₂ and NO_x emissions from HGV vehicles and construction equipment.
- 11.4.2 Assuming a 35-year operational life, the Proposed Development is estimated to offset approximately 568,000 tonnes of CO₂ equivalent (tCO₂e) emissions. It is calculated that the CO₂ emissions that will be emitted as part of the construction of the Proposed Development will be paid back within approximately 0.7 years (approximately 8.5 months).
- 11.4.3 The Proposed Development's carbon saving potential will contribute positively to meeting Scotland's net zero greenhouse gas emissions targets resulting in a **Moderate (Beneficial) (Significant)** effect.
- 11.4.4 In terms of adaptation, further consideration was given to whether or not the introduction of the Proposed Development is likely to affect judgements of effects and/or the ability of the receptors within or close to the Site to

adapt to climate change. Predicting future outcomes is naturally difficult, however in combination climate effects (effects of Proposed Development combined with climate change) are not predicted to vary markedly over the Proposed Development's lifespan from the effects set out already in the EIA Report and summarised in this NTS.

- 11.4.5 All wind farms will produce direct and embodied greenhouse gas emissions during construction. It is assumed, however, that any other applications that are consented and built will include reasonable measures to avoid, reduce and/or avoid the generation of greenhouse gas emissions, particularly from construction traffic. Overall, a **Minor (Adverse)** cumulative construction effect is therefore predicted which will be **Not Significant**.
- 11.4.6 In terms of carbon losses and offsetting, the Proposed Development, in combination with other onshore wind developments, will have a positive effect on offsetting emissions released from the burning of fossil fuels and will play an integral part in helping Scotland meet its climate change and energy targets. A **Major (Beneficial)** and **Significant** effect is therefore identified, given the importance of this collective role of onshore wind generation to addressing the global climate emergency.

11.5 Proposed Additional Mitigation/Enhancement

- 11.5.1 No specific mitigation measures are proposed in relation to climate change, although the CTMP and Staff Travel Plan will be implemented as good practice, with the intention that measures will be implemented to ensure traffic movements are undertaken efficiently during construction, and unnecessary journeys avoided, thereby reducing emissions from construction.

11.6 Summary of Likely Significant Residual Effects

- 11.6.1 There will be a **Moderate (Beneficial)** effect in relation to carbon savings during operation of the Proposed Development and a **Major (Beneficial)** cumulative effect when considering the same effect from all other onshore wind developments.

12. Shadow Flicker

12.1 Introduction

- 12.1.1 Under certain combinations of geographical position, time of day and year, the sun may pass behind the rotor and cast a shadow over neighbouring buildings' windows. When the blades rotate and the shadow passes a window, the shadow appears to flick on and off; this effect is known as shadow flicker.
- 12.1.2 The full shadow flicker assessment can be found in **Technical Appendix 4.3: Shadow Flicker** of the EIA Report.

12.2 Overview of Methodology

- 12.2.1 There is no standard for the assessment of shadow flicker in the UK, and there are no guidelines which quantify what exposure levels are acceptable or which are significant in EIA terms. As such, the purpose of the shadow flicker assessment is to quantify the level of exposure that could be theoretically possible at nearby residential properties as required by local and national planning policy, and to determine how shadow flicker occurrence could be managed or mitigated if required.
- 12.2.2 A review of the most up to date evidence base shows that shadow flicker only occurs within 130 degrees either side of north relative to a wind turbine. Buildings located beyond 130 degrees either side of north are generally unaffected by shadow flicker as there is usually no direct path between the sun, the wind turbines and any buildings located within this area. It also suggests that quantifying shadow flicker occurrence for properties within 10 rotor diameters is appropriate. Therefore, the study area for assessing shadow flicker included all properties within 10 rotor diameters (in this case 1,330 m) and 130 degrees either side of north of the turbine positions.
- 12.2.3 Specialist software packages were used to model the level of occurrence.

12.3 Overview of Baseline Conditions

- 12.3.1 There are six residential properties within the study area which could theoretically experience shadow flicker at some point during the operation of the Proposed Development turbines, namely: Larbrax Cottages, Larbrax Lodge, Greenburn, Meikle Galdenoch, Drumwhistley and Galdenoch Mill Cottage.

12.4 Quantification of Shadow Flicker Occurrence

- 12.4.1 The modelling suggests that a maximum of 47.9 hours of shadow flicker will occur at Larbrax Cottages. Galdenoch Mill Cottage is not expected to be affected. It has been shown that the times of day when shadow flicker could theoretically occur varies between 19:10 and 20:03 during the months of April to August, and between 15:47 and 18:07 during the months of September to November and January to March. This level of occurrence is an absolute worst-case scenario, and is unrealistic as it assumes the sun always shines in a clear sky (i.e. no account of climatic conditions such as clouds or precipitation has been made); objects surrounding the windows that may block the view to turbines such as trees, buildings have been disregarded; the turbine blades are always aligned face-on to the window, providing the maximum opportunity for shadow flicker; and the blades are always turning (i.e. no account has been taken of calm winds or shut-down periods).
- 12.4.2 To quantify a more realistic level of occurrence, weather data has been factored into the modelling. Regional Met Office data gives actual sunshine hours for the Dumfries and Galloway region to be approximately 30% of total daylight hours. As such, the results have been reduced by 70% which gives a more realistic value of 14.3 hours per year for the most affected property (Larbrax Cottages). It is, however, expected that the actual occurrence will still be much lower in reality for the reasons given above.

12.5 Proposed Additional Mitigation/Enhancement

- 12.5.1 No routine mitigation is proposed at this stage. If the Applicant receives complaints for residents about shadow flicker occurrence during operation, then mitigation measures can be incorporated into the operation of the wind turbines to reduce the amount of shadow flicker experienced.

13. Aviation

13.1 Introduction

- 13.1.1 An aviation risk assessment has been undertaken to determine the impact that the operation of the Proposed Development could have on surrounding aviation activity.
- 13.1.2 The full assessment can be found in **Technical Appendix 4.2: Aviation Risk Assessment** of the EIA Report.

13.2 Overview of Methodology

- 13.2.1 There is no guidance on what impacts on aviation is considered to be acceptable or significant in EIA terms. As such, the purpose of aviation assessments is to determine the level of risk associated with a proposal, and understand how best to manage these risks i.e. through mitigation etc.
- 13.2.2 The assessment has been desk-based only and has involved the identification of relevant aviation infrastructure within statutory safeguarding distances that could be affected by the operation of the turbines, such as aerodromes (licenced, unlicensed and military), radar (weather and aviation related) and radio navigation aids. Military low flying has also been considered. For radar within the safeguarding distances, radar line of sight modelling was undertaken to determine if the turbines will be detectable and could therefore cause potential interference to their operation. Consideration was given to the distance of the radar and the sensitivity of the location of the Site.
- 13.2.3 The assessment has taken into account the relevant legislation and guidance developed by the Civil Aviation Authority (CAA) and the National Air traffic Services (NATS).

13.3 Overview of Baseline Conditions

- 13.3.1 No Met Office radar or civil airfields are within safeguarding distances of the Site. Lowther Hill radar is approximately 104 km from the Site and provides air traffic services for central Scotland. The Ministry of Defence (MoD) West Freugh radar is approximately 16 km from the Site. The Site is also within a military low flying area (LFA 16) where military and emergency services training exercises occur. The Site is outside Tactical Training Area (TTA) 20 which covers Ayrshire and Dumfriesshire and enables low-flying fast jets to fly down to 100 feet. Belfast City Airport (BCA) radar is also approximately 56 km from the Site. It is a licenced aerodrome operating domestic and international flights.

13.4 Quantification of Aviation Risk

- 13.4.1 The key risk identified through the assessment is in relation to the BCA radar. However, whilst radar line of sight modelling has shown that the turbines will be theoretically visible to the radar, the Site is beyond the 30 km safeguarding distance recommended by the CAA for planning purposes, and as such; it is predicted that the impact can be operationally accommodated. In addition, the CAA did not raise any concerns regarding the Consented Larbrax Wind Farm.
- 13.4.2 The MoD has published a map indicating areas within the UK where military low flying activities are the most likely to cause an objection. LFA 16 is a low priority military low flying area less likely to raise concerns.

13.5 Proposed Additional Mitigation/Enhancement

- 13.5.1 The Applicant will engage with the CAA should concerns be raised through planning regarding the impact on the operational capability of the BCA radar. Mitigation is usually achievable and will be secured through a legal agreement between the CAA and the Applicant.
- 13.5.2 It is likely that the MoD will request that the turbines be fitted with MoD accredited infra-red (non-visible to naked eye) aviation lights to the turbine hubs in accordance with CAA Air Navigation Order 2016. This will enable low flying aircraft (military and emergency) to detect the turbines at night and avoid any physical obstruction to flying activity.

14. Summary of Likely Significant Effects

- 14.1.1 The EIA for the Proposed Development has been carried out in accordance with regulatory requirements and guidance on good practice. The findings of the surveys undertaken, in addition to consultation, have informed the design process and assessment.
- 14.1.2 **No significant** effects are predicted in relation to the following topics:
- Chapter 8: Ornithology;
 - Chapter 9: Hydrology, Geology, Hydrogeology and Peat;
 - Chapter 10: Noise and Vibration.
- 14.1.3 Shadow flicker and aviation effects are considered to be acceptable.
- 14.1.4 Prior to committed mitigation, **Significant** effects are predicted in relation to the following topics:
- Chapter 5: Landscape and Visual Impact Assessment;
 - Chapter 6: Cultural Heritage;
 - Chapter 7: Ecology (Beneficial);
 - Chapter 11: Access, Traffic and Transport; and
 - Chapter 12: Climate Change (Beneficial).
- 14.1.5 Following additional mitigation, **Significant** residual effects remain for the following topics:
- Chapter 5: Landscape and Visual Impact Assessment;
 - Chapter 7: Ecology (Beneficial); and
 - Chapter 12: Climate Change (Beneficial).
- 14.1.6 The **Significant** adverse residual effects from the Proposed Development on landscape and visual receptors cannot be mitigated further given the nature of wind farm development, but they have been reduced to the lowest practical level through the evolution of the iterative design process. This has included a reduction in the number of turbines and their re-siting.

 Site boundary

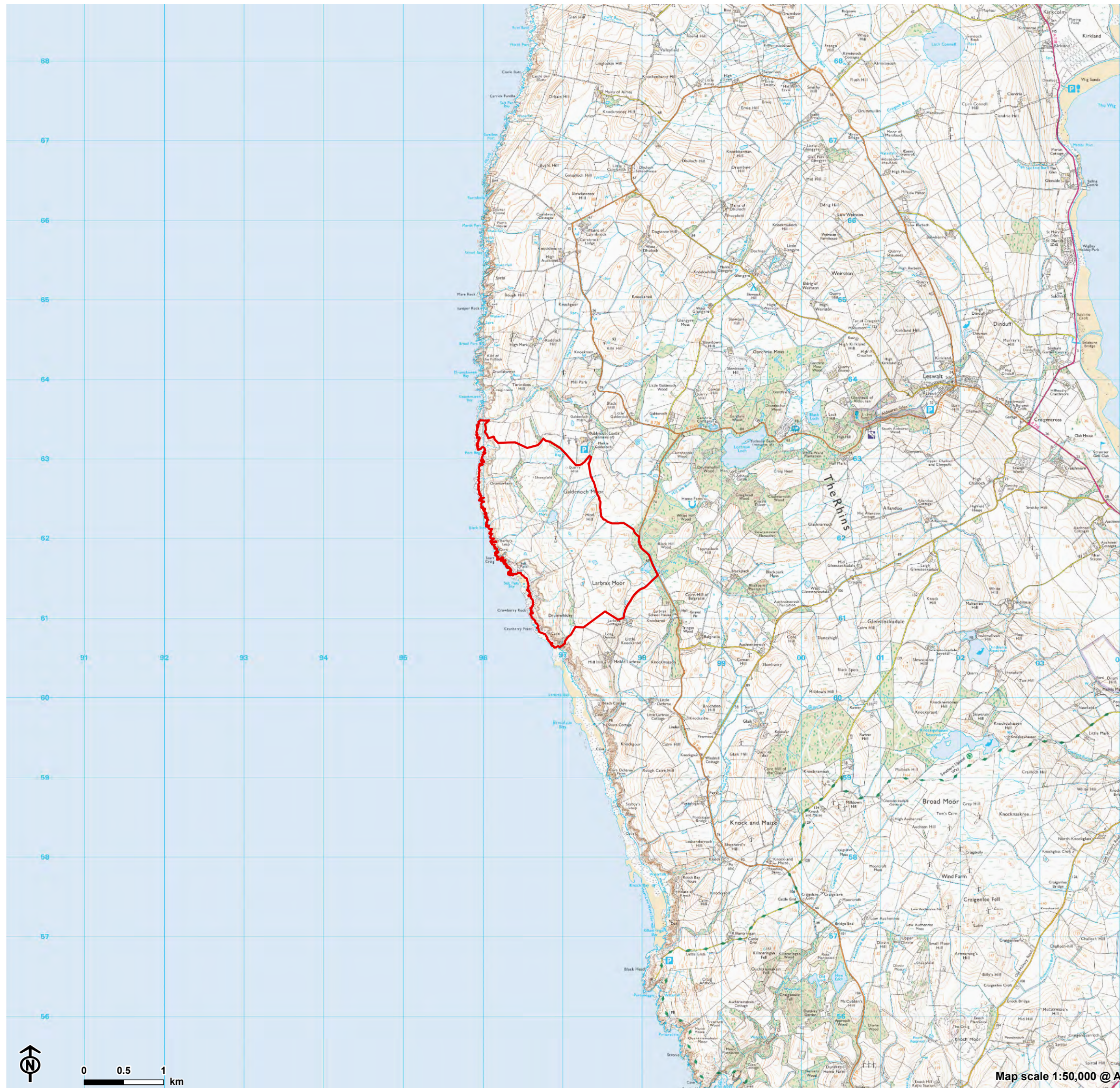
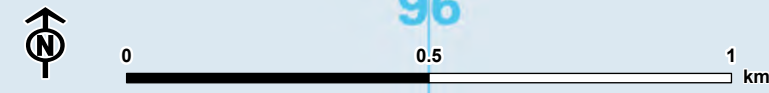




Figure 2: Site Layout



- Site boundary
- Turbine
- Hardstanding temporary
- Hardstanding permanent
- Temporary borrow pit
- Temporary construction compound
- Substation/battery storage
- Track to be upgraded
- Proposed new track/access junction
- Tree/scrub removal
- New watercourse crossing
- Existing (upgraded) watercourse crossing



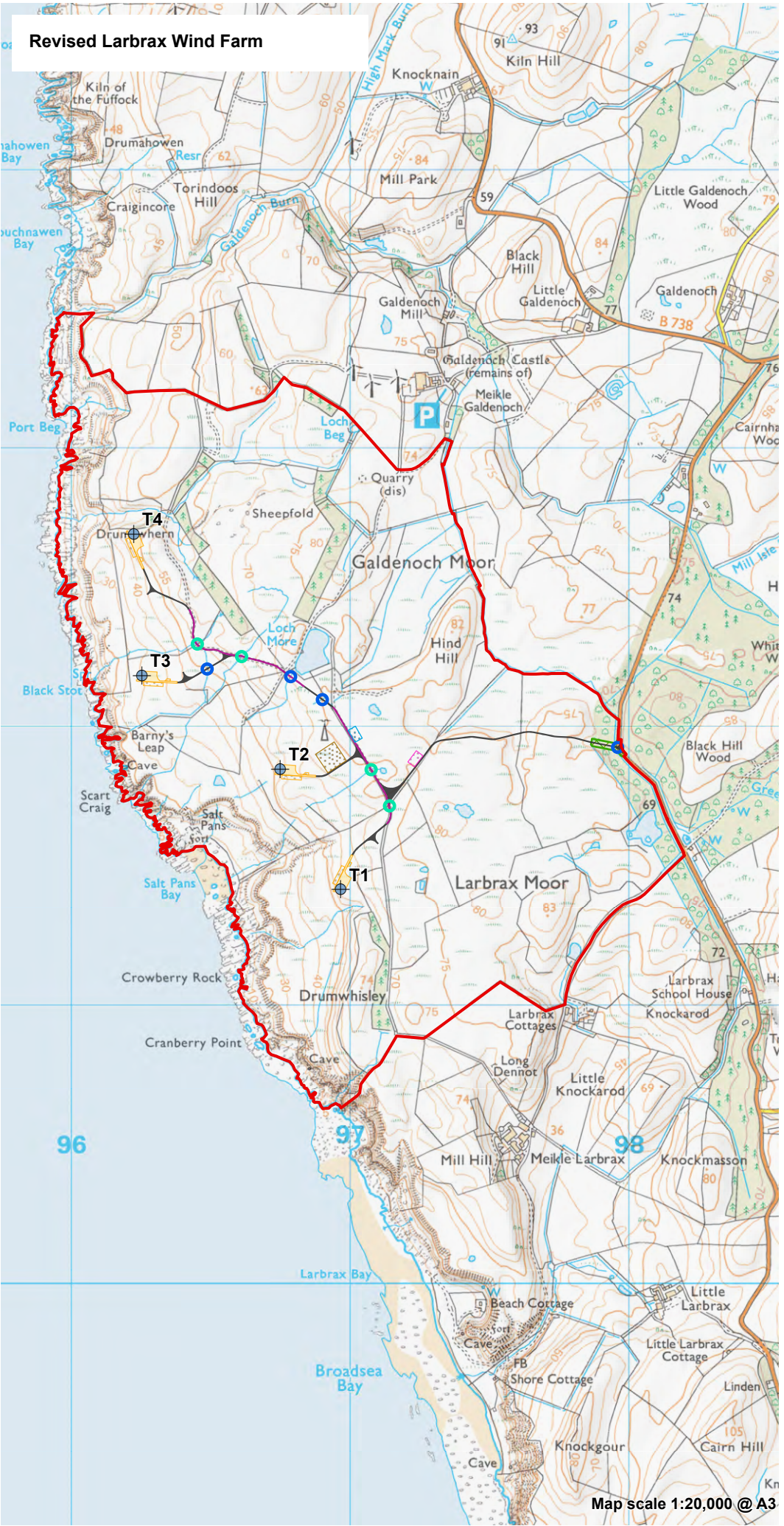


Figure 3: Comparison of Proposed Development with Consented Larbrax Wind Farm

Consented Larbrax Wind Farm Layout

- Site boundary
- Turbine
- Crane pad laydown area
- Borrow pit
- Construction compound
- Substation
- Water crossing
- Permanent met mast
- Power performance mast
- Site access tracks
- Proposed compensatory planting area
- Proposed felling area
- Broad-leaved woodland planting area

Revised Larbrax Wind Farm Layout

- Site boundary
- Turbine
- Hardstanding temporary
- Hardstanding permanent
- Temporary borrow pit
- Temporary construction compound
- Substation/battery storage
- Track to be upgraded
- Proposed new track/access junction
- Tree/scrub removal
- New watercourse crossing
- Existing (upgraded) watercourse crossing

