



Kirkan Wind Farm Ltd

Kirkan Onshore Wind Farm

Scoping Report

661694

MAY 2018

RSK



RSK GENERAL NOTES

Project No.: G/P/661694/05/01/01 Rev01

Title: Kirkan Onshore Wind Farm: Scoping Report

Client: Kirkan Wind Farm Ltd

Date: 16th May 2018

Office: Glasgow

Status: Final

Author Robert Beck

Date: 16/05/2018

Technical reviewer Mike Kelly

Date: 16/05/2018

Project manager Joe Somerville

Date: 16/05/2018

RSK Environment Ltd (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of RSK and the party for whom it was prepared.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

CONTENTS

1	INTRODUCTION	1
1.1	Background	1
1.2	Requirements of the Legislation	1
1.3	The Scoping Process	2
1.4	Document Structure.....	2
1.5	Planning Policy Context	3
1.5.1	Project Need and the Renewable Energy Policy Framework	3
1.5.2	National Planning Policy and Guidance	3
1.5.3	The Local Development Plan	3
2	PROJECT DESCRIPTION	5
2.1	Background	5
2.2	Site Description	5
2.3	Project Development	5
2.3.1	Summary of Key Components	5
2.3.2	Wind Turbines	6
2.3.3	Permanent Anemometer Mast	6
2.3.4	Access to Site and Internal Tracks.....	6
2.3.5	Watercourse Crossings	7
2.3.6	Grid Connection, Energy Storage and Operations Control Building	7
2.3.7	Internal Cabling	7
2.3.8	Stone and Aggregate	7
2.3.9	Construction Compounds and Work Areas.....	8
3	ENVIRONMENTAL IMPACT ASSESSMENT SCOPE.....	9
3.1	Overall Approach.....	9
3.1.1	Consultation.....	9
3.1.2	Baseline.....	10
3.1.3	Assessment of Environmental Impacts and their Significance	10
3.1.4	Development of Mitigation Measures	11
3.2	Environmental Aspects to be Assessed.....	11
3.2.1	Background	11
3.2.2	Landscape Character and Visual Assessment	11
3.2.3	Cultural Heritage and Archaeology	20
3.2.4	Ecology.....	23
3.2.5	Ornithology	35
3.2.6	Hydrology	46
3.2.7	Geology, Hydrogeology and Peat	50
3.2.8	Noise and Vibration	54
3.2.9	Traffic and Transportation	58
3.2.10	Aviation and Radar	62
3.2.11	Telecommunications.....	62
3.2.12	Miscellaneous.....	63
3.3	Environmental Aspects Scoped Out.....	66
3.3.1	Air Quality	66

3.3.2	Population and Human Health	66
3.3.3	Vulnerability of the development to risks of major accidents and/or disasters (including climate change).....	67
3.3.4	Shadow Flicker	68
3.3.5	Socio-economic, Land-use and Tourism.....	68
4	CONSULTATION	70
4.1	Public Consultation.....	70
4.2	Statutory and non-statutory consultees.....	70
5	REFERENCES	71
5.1	Publications	71
5.2	Websites.....	74

TABLES

Table 3.1	Residual Effects	15
Table 3.2:	Provisional List of Viewpoints	17
Table 3.3:	Designated sites for nature conservation within 5km of the project area.	26
Table 3.4:	VP locations	36
Table 3.5:	VP survey effort – Year 1.....	37
Table 3.6:	Internationally designated sites with ornithological interests within 20km of the project area.	40
Table 3.7:	Target species flight activity summary – year 1.....	41
Table 3.8:	Breeding wader territories – Year 1.	42
Table 3.9:	Distances to designated assets	52
Table 3.10:	Free-field Noise Criteria against which Construction Noise Effects are Assessed	56

FIGURES

Figure 1:	Site Location Plan.....	78
Figure 2:	Site Layout Plan.....	79
Figure 3:	Environmental Designations within 15 km.....	80
Figure 4:	Blade Tip Zone of Theoretical Visibility and Provisional List of Viewpoints.....	81
Figure 5:	Landscape Character Areas	82
Figure 6:	Landscape Designations within 35 km	83
Figure 7:	Cumulative Wind farms within 60 km.....	84
Figure 8:	Cultural heritage designations within 5/10 km	85
Figure 9:	Phase 1 Ecological Habitat Map.....	86

APPENDICES

APPENDIX 1 – LIST OF CONSULTEES	75
APPENDIX 2 – FIGURES AND PHOTOGRAPHS.....	77

1 INTRODUCTION

1.1 Background

Kirkan Wind Farm Limited ('the applicant') is proposing to submit an application for consent for the Kirkan Wind Farm (hereafter referred to as "the proposed development"), located approximately 5.8 km northwest of Garve, Highlands, on the southern side of the A835 trunk road southeast of Loch Glascarnoch dam. The site currently forms a small part of the Strathvaich Estate. At this early stage of the design process, it is anticipated that up to 19 turbines will be constructed on the site. At this stage, the final turbine dimensions are unknown, but for the purposes of this Scoping Report, it has been assumed that each turbine will have a maximum height to blade tip up to 175 metres (m). Each turbine is likely to generate up to 4.8 Megawatts (MW) of electricity. The total installed capacity of the proposed development is therefore predicted to be greater than 50 MW.

Kirkan Wind Farm Limited is a project company wholly owned by Coriolis Energy Limited ('Coriolis Energy') and ESB Asset Development Limited ('ESB').

ESB is Ireland's premier energy company and is a leading independent power generator in the UK market. ESB has a track record of over 20 years as a successful investor in the UK since commissioning one of the first independent power generation plants at Corby in Northamptonshire in 1994.

ESB owns and operates wind farms across the UK and Ireland with a total installed capacity of 450 MW.

ESB works in partnership with Coriolis Energy. Coriolis Energy identifies and works on the development of wind farm proposals and ESB constructs and operates those wind farms.

Coriolis Energy is a specialist independent wind farm development company operating throughout the UK. Its principals have been responsible for successfully developing some 15 onshore wind farms in the UK with a capacity of over 500 MW over a period of 17 years.

Coriolis Energy has appointed RSK Environment Ltd (RSK), an experienced environmental consultancy, as lead consultant to carry out the Environmental Impact Assessment and related assessments to accompany a Section 36 Application to Scottish Ministers.

1.2 Requirements of the Legislation

Any proposal to construct or operate a power generation scheme with a capacity in excess of 50 megawatts requires Scottish Ministers' consent under Section 36 of the Electricity Act 1989.

Schedule 9 of the Act places on the applicant a duty to "have regard to the desirability of preserving the natural beauty of the countryside, of conserving flora, fauna and

geological and physiological features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest”.

Under the *Electricity Works (Environmental Impact Assessment) (Scotland) (EIA) Regulations 2017* (henceforth referred to as the EIA regulations), the Scottish Ministers are required to consider whether any proposal for a wind farm is likely to have a significant effect on the environment.

Whilst not a statutory requirement, as part of the EIA process, the applicant wishes to seek a formal scoping opinion from the Energy Consents Unit (ECU) on behalf of the Scottish Ministers under the EIA regulations. This document is the Scoping Report, which contains the necessary information as required under Part 4 Section 12 of the *Electricity Works (Environmental Impact Assessment) (Scotland) (EIA) Regulations 2017*.

1.3 The Scoping Process

Scoping is undertaken in order to refine the scope of the assessment of environmental impacts and ensure that it is robust but focused in its approach on potentially significant effects. This will be achieved by inviting the Scottish Ministers and consultees to:

- Specify aspects of the environment and issues relating to these that should be considered and addressed in the EIA (with particular emphasis on any issues local to the site);
- Comment on the proposed approach to the EIA;
- Comment on or recommend, where appropriate, assessment methodologies; and
- Highlight other relevant bodies or organisations that may have a vested interest in the scheme or be able to provide relevant information.

Once the scoping opinion has been received from the Energy Consents Unit (see Section 4 for contact details), the response will be analysed and the relevant points raised therein taken forward and used to inform the assessment process.

1.4 Document Structure

In accordance with Part 4, Section 12 (2) of the EIA Regulations, when making a scoping request the developer is required to include:

“(a) a description of the location of the development, including a plan sufficient to identify the land;

“(b) a brief description of the nature and purpose of the development and of its likely significant effects on the environment; and

“(c) such other information or representations as the developer may wish to provide or make.”

These requirements are addressed in this scoping report as indicated above. Section 4 details the procedure for making comments in relation to this scoping exercise. Appendix 2 contains the relevant maps and figures referred to in this Scoping Report.

1.5 Planning Policy Context

1.5.1 Project Need and the Renewable Energy Policy Framework

The EIA report will describe, in summary, the renewable energy policy framework and associated need case for renewables, identified as a matter of both law and policy, at international, European and domestic levels. Such need is relevant in respect of responding to climate change and of ensuring energy security. The EU Renewable Energy Directive 2009/28/EC imposes a minimum requirement for the share of renewable energy in gross UK energy final consumption of 15% in 2020. The Promotion of Energy from Renewable Sources Regulations 2011 rehearse this in domestic law.

The proposed development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The clear objectives of the Scottish Government will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.

The proposed development would make a valuable contribution to the attainment of renewable energy and electricity targets at both the Scottish and UK levels and the quantification of this contribution would be described as per the requirements of Scottish Planning Policy. The description of the renewable energy policy framework will also make reference to the now finalised Scottish Government Climate Change Plan, Energy Strategy and the Onshore Wind Policy Statement.

1.5.2 National Planning Policy and Guidance

Reference will be made to various national planning policy and guidance documents including:

- The National Planning Policy Framework 3 (NPF3);
- Scottish Planning Policy (SPP);
- Scottish Government web based Renewables Guidance; and
- Scottish Government policy and guidance on shared ownership.

1.5.3 The Local Development Plan

The planning policy context applying to the site will be taken into account in the iterative EIA design process. The relevant planning policy framework will also be described in the ES.

The statutory development plan for the site comprises the Highland-wide Local Development Plan (HwLDP) (adopted April 2012)¹ and associated statutory Supplementary Guidance (SG). Key policies will include:

- Policy 67 – Renewable Energy Developments;
- Policy 61 – Landscape;

¹ The Ross & Cromarty East Local Plan (as continued in force, April 2012) also applies but does not contain relevant policies or allocations.

- Policy 57 – Natural, Built and Cultural Heritage;
- Policy 51 – Trees and Woodland;
- Policy 52 – Principle of development in Woodland.

Other HwLDP policies will be referenced and taken into account including policies 28, 30, 31, 36, 55, 56, 58, 59, 60, 62, 63, 64, 66, 69, and 77.

Of particular relevance will be the Onshore Wind Energy SG (November 2016) which includes the Council's onshore wind Spatial Framework and expands on the provisions of Policy 67 of the HwLDP. Furthermore, the Council have referred the applicant in their early consultation response to the RACELP, WestPlan and IMFLDP plans, which will be given due regard.

It should be noted that a Planning Statement will be provided with the application (but separate from the EIA report) which will contain an assessment of the accordance of the proposed development with relevant policy provisions as referred to above.

2 PROJECT DESCRIPTION

2.1 Background

This section describes the proposed development. A brief description of the site and surroundings is given followed by a description of the components of the scheme. Figure 1 shows the location and boundary of the area under consideration, forming part of the Strathvaich estate (referred to as the project area) and an indicative layout of turbines, based on initial feasibility work. It should be noted however, that beyond scoping, the design of the development, including the number of turbines proposed, will evolve to take account of constraints and issues raised during scoping, through baseline studies both completed and currently in progress, and through the subsequent iterative assessment of impacts.

2.2 Site Description

The project area is located on Strathvaich Estate, which sits within the Garve District of the Ross & Cromarty region of the Highlands. The estate is currently used for deer stalking, with some sheep and highland cattle rearing. The wider estate is also subject to substantial habitat management, peatland restoration (funded by SNH) and woodland planting schemes, and is a member of both the West and North Ross Deer Management Groups. Strathvaich Estate also has a SSSI Agreement for Beinn Dearg.

The proposed wind farm site lies to the south of the A835 trunk road from the Garve to Ullapool, to the east of the operational Corriemoillie and Lochluichart wind farms. It comprises moorland which is visible in parts from the public road to the north and east but substantially screened from the south. The area is very sparsely populated although there are some isolated dwellings along the A835.

An area of young mixed plantation woodland is located along the eastern fringe of the project area.

The site location is shown in Figure 1, and a site layout plan with provisional turbine locations is shown in Figure 2.

2.3 Project Development

2.3.1 Summary of Key Components

The Kirkan Wind Farm development infrastructure will include:

- Wind turbines and associated infrastructure;
- Site entrance and access track from the A835 trunk road via an existing lay-by junction;
- Internal and private access road network;
- Permanent meteorological masts;
- Borrow pits;

- Transformers and underground cables;
- Onsite sub-station / control building;
- Energy storage equipment; and
- One or more temporary construction compounds.

It is anticipated that the turbines proposed for the site would have the following physical characteristics:

- Number of turbines: up to 19 (to be confirmed through EIA);
- Height to blade tip: up to 175m;
- Rotor diameters: up to 142m;
- Individual turbine generating capacity: likely to be between 3.5 – 4.8 MW; and
- Total generating capacity: likely to be in excess of 50 MW.

2.3.2 Wind Turbines

Based upon current site information, it is considered that the site can accommodate up to 19 turbines. The final number will be determined by environmental, technical and commercial constraints identified during the EIA and iterative design process. The final dimensions of each turbine will also be determined as the design process progresses.

The detailed design specification for each foundation will depend on the type of turbine procured, and the specific ground conditions at the location of each turbine.

2.3.3 Permanent Anemometer Mast

The scheme will include permanent anemometer mast(s) located within the project area to provide ongoing monitoring of the wind conditions after commissioning of the scheme.

As with turbine locations, the exact location of the anemometer mast(s) have yet to be finalised, as these will depend on the type of turbine that will be used and the constraints identified during scoping and the iterative assessment.

The anemometer mast(s) height will be near identical to turbine tower heights. The selection of the mast will take account of the ease of construction and ability to reduce visual impact. Access to the anemometer mast(s) would connect with the main network of site tracks (see below).

2.3.4 Access to Site and Internal Tracks

Access to the site for vehicles delivering both construction materials and turbine components, such as tower sections and blades will be from the A835 trunk road to the north of the site via the existing junction to a car park (approx. 600m east of Aultguish) leading to the existing access road for an operational telecommunications mast site set within a larger fenced sheep enclosure. The access will be developed to meet the requirements of appropriate guidelines (such as visibility, construction materials, surface water drainage, gradient and safety of other road users).

Tracks used by construction vehicles will be retained throughout the lifetime of the wind farm for use by maintenance vehicles. The width of the tracks will be approximately 5 m, although may be wider for short sections, such as passing places, laydown areas and sharp bends. The surface of the tracks will have a cross fall in order to drain run-off into ditches on the downhill side of the track where necessary, and lateral and cross drains will also be installed where required. Outlets will be suitably located with erosion protection as required.

2.3.5 Watercourse Crossings

In Scotland from the 1st January 2018, the Water Environment (Miscellaneous) (Scotland) Regulations 2017 comes into force. This new legislation will impact the construction industry by requiring a formal Controlled Activities Regulations (CAR) licence to discharge water to the environment for construction sites (such as wind farms) larger than 4 hectares.

New crossings will be designed in accordance with Scottish Government best practice and taking due regard of SEPA guidelines to enable the passage of fish and other wildlife. Any upgrades to existing water crossings that are required will also comply with Scottish Government and SEPA best practice.

2.3.6 Grid Connection, Energy Storage and Operations Control Building

Cables from the wind farm will be connected to the substation building, which will incorporate the switchgear and metering equipment. In addition to the grid connection equipment, a control and metering room, telecommunications equipment, an office, and welfare facilities for visiting staff will be housed. The connection to the substation to the wider grid network will fall under a separate consenting process and will be subject to a separate environmental investigation and application. Therefore, this will not be considered as part of the EIA for the proposed wind farm development.

In addition to wind farm operation control and connection for export to the grid network, equipment and facilities for the storage of electricity will be present on site. This may take the form either of housed or containerised arrays of lithium or other batteries, or potentially other non-battery forms of energy storage technology. The power and energy capacity of such storage will be subject to the final installed capacity of the wind farm element of the project, and depending on the nature of grid connection secured may be additive to the total project capacity.

2.3.7 Internal Cabling

All power and cabling on site from and between the wind turbines will be buried in trenches largely located directly adjacent to the internal tracks where possible.

2.3.8 Stone and Aggregate

The proposed development will require crushed stone to construct new tracks, create hard standing areas for the cranes and lay the foundations. It is the intention that suitable stone and aggregate will be sourced from on-site borrow pits. However, for the purposes of the scoping and EIA exercise an alternative option of external delivery of stone and aggregate will also be considered.

2.3.9 Construction Compounds and Work Areas

During the construction period, one or more construction compounds will be required that will include laydown areas. The main construction site office and compound will comprise temporary cabins to be used for the site offices, the monitoring of incoming vehicles and welfare facilities for site staff including toilets; parking for construction staff, visitors and construction vehicles; secure storage for tools and small parts; a receiving area for incoming vehicles; and security fencing around the compound.

The compounds will be used as a storage area for the various components, fuels and materials required for construction. The major structural components of the turbines would be delivered directly to site. Temporary lay-down areas will be provided for parking and unloading delivery vehicles and, in particular, abnormal loads.

3 ENVIRONMENTAL IMPACT ASSESSMENT SCOPE

3.1 Overall Approach

The EIA will be conducted in accordance with the requirements of the EIA regulations. The following key stages will form the basis of the assessment process:

- Consultation with statutory and non–statutory bodies and relevant stakeholders;
- Establishing a robust baseline of the existing environment on and around the site;
- Assessment of the environmental impacts and establishing their significance (primarily the assessment of residual effects once mitigation has been adopted); and
- Formulation of mitigation measures to ameliorate the potential impacts of the proposed development that cannot practically be avoided through site design.

Where, in the professional opinion of the environmental specialists, particular impacts are not predicted to be significant, it is proposed to scope these out. The environmental aspects proposed to be scoped out of the EIA process are outlined in Section 3.3.

Following established best practice, it is intended that the design of Kirkan Wind Farm will evolve in an iterative manner with the assessment process, led mainly by the consideration of constraints that exist within and around the project area (environmental, technical and economic). Once the preferred design is selected, this will form the basis of the impact assessment. The four key stages of assessment are summarised below.

3.1.1 Consultation

Consultations with relevant authorities, organisations and stakeholders will be undertaken throughout the EIA and site design process, commencing with scoping. The consultations will serve four main purposes:

- To establish a sufficiently robust environmental baseline of the project area and its surroundings;
- To identify, early in the process, specific concerns and issues relating to the site and proposed development in order that they can be discussed and accounted for appropriately in the design and assessment;
- To ensure appropriate involvement of the public and authorities in the assessment and design process; and
- To fulfil the applicant's obligations under EIA regulations and Section 36 of the Electricity Act 1989.

The applicant intends to carry out community consultation, with public exhibitions and circulars and would welcome input from local communities and residents to the Scoping process. The outcome of the consultation process will be compiled into a Statement of Community Consultation ('SOCC') report to accompany the Section 36 application

detailing the consultation undertaken and any changes made to the proposal as a result.

3.1.2 Baseline

For each environmental aspect under consideration for the EIA, the environmental baseline of the site and its surroundings will be established (see Section 3.2). This will be achieved through consultations with relevant authorities and organisations, a desktop review of available data including that generated from consultations, and completion of specialist field surveys. Relevant information and data already held by the applicant gathered during the pre-application feasibility/screening stage will also be used in the EIA process.

The baseline information gathered to date as part of this process will form the basis of assessment and further consultations with the relevant authorities and stakeholders.

3.1.3 Assessment of Environmental Impacts and their Significance

In accordance with the EIA Regulations potential environmental impacts of the Development will be identified and their significance determined. Evaluation of significance will use specific criteria for each assessment topic. These will follow best practice guidance where available and will consider the following:

- Compatibility with planning policy and environmental standards;
- Impact extent and magnitude;
- Impact nature (whether beneficial or adverse, direct or indirect, primary or secondary, permanent or temporary);
- Importance and sensitivity of the environmental receptor;
- The number of receptors that are impacted;
- Impact duration (whether short, medium or long term); and
- Whether it is a standalone impact or is cumulative.

Unless specified otherwise in the EIA report ('ER'), the following terms will be used to assess impact significance where they are predicted to occur:

- Major beneficial or adverse – where the development would cause a significant improvement or deterioration to the existing environment;
- Moderate beneficial or adverse – where the development would cause a noticeable improvement or deterioration to the existing environment;
- Minor beneficial or adverse – where the development would cause a barely perceptible improvement or deterioration to the existing environment; and
- Negligible – no discernible improvement or deterioration to the existing environment.

For all environmental aspects, the significance of residual impacts i.e. those predicted once mitigation is taken account of, will form the basis of the assessment. An outline of the proposed methods of assessment for each environmental topic is provided in Section 3.2 onwards.

3.1.4 Development of Mitigation Measures

Due to the proposed 'constraints-led' iterative evolution of the site design for the proposed development, most mitigation measures are considered likely to be embedded within the design of the site rather than as 'add-on' measures to ameliorate significant environmental effects. The evolution of the design, therefore, will be reported clearly in the EIA report, including the rationale behind the preferred choice of development design.

All other measures proposed as mitigation for the proposed development will be reported within the relevant section of the ER. The mechanism by which these measures will be carried through to implementation on site will also be made clear.

3.2 Environmental Aspects to be Assessed

3.2.1 Background

This section identifies the environmental aspects that the applicant proposes to address within the EIA for the Kirkan Wind Farm. It discusses each aspect in terms of a brief summary of the environmental baseline for each (where practical), the relevant potential impacts and an overview of the proposed method of assessment for each one. Where relevant, the technical areas will be assessed in the context of a defined study area that is informed by industry guidance, best practice and likely design of the wind farm.

3.2.2 Landscape Character and Visual Assessment

3.2.2.1 Introduction

The aim of the landscape and visual impact assessment ("LVIA") is to identify, predict and evaluate potential landscape and visual effects arising from the proposed development and associated ancillary elements. Wherever possible, effects will be quantified, but the nature of landscape and visual assessment requires interpretation by professional judgement.

In order to provide a level of consistency to the assessment, landscape sensitivity to change, the prediction of magnitude of change/impact and assessment of significance of the residual effects has been based on pre-defined criteria based on guidance provided by the Landscape Institute, as refined for the purposes of wind farm assessment and taking account of relevant technical and planning guidance.

3.2.2.2 Consultation

Pre-application advice and consultation has been sought and received from the Highland Council (THC) and Scottish Natural Heritage (SNH). In addition to this scoping submission, further detailed consultations are intended with THC, and SNH in respect of the following:

- LVIA scope and detailed methodology;
- The scope and inclusions for the cumulative assessment component of the LVIA;
- Wild Land Impact Assessment (WLIA) scope and methodology; and

- Selection of representative viewpoints for inclusion in the LVIA and WLIA.

3.2.2.3 Preliminary Environmental Baseline

3.2.2.3.1 Site location and description

The Site is situated in Ross and Cromarty, Highland, in northern Scotland, north-west of Dingwall, and to the south east of Loch Glascarnoch. The project area occupies an area of upland moorland comprising open grassland and an area of young mixed plantation. It is situated immediately adjacent to the existing clusters of turbines at Corriemoillie and Lochluichart wind farms.

3.2.2.3.2 Landscape character context

The proposed development would be located in a largely unsettled and remote location and set within a landscape comprising a number of distinct Landscape character types (LCTS). Those with potential views of the proposed development comprise:

- Irregular Massif (LCT CLS6);
- Rugged Massif (LCT INV1);
- Rocky Moorland Plateau with Woodland (LCT INV4);
- Forest Edge Farming (LCT MYF7);
- Smooth Moorland (LCT RCY1);
- Undulating Moorland (LCT RCY2);
- Sloping Terrace Moorland (LCT RCY3);
- Rocky Moorland (LCT RCY4);
- Rugged Mountain Massif (LCT RCY6);
- Rounded Hills (LCT RCY7); and
- Forest Edge Farming (LCT RCY10).

The proposed development is located at the confluence of LCTs RCY2, RCY4 and RCY7. The location and extent of all of the LCTs are shown on Figure 5, along with an overlay of the ZTV findings from Figure 4.

The key characteristics of these LCTs are provided in the following published character assessments:

- SNH (1998) Caithness and Sutherland Landscape Character Assessment No. 103;
- SNH (1998) Inverness District Landscape Character Assessment No. 114;
- SNH (1998) Moray and Nairn Landscape Character Assessment No. 101; and
- SNH (1999) Ross and Cromarty Landscape Character Assessment No. 119.

3.2.2.3.3 Landscape designations

The proposed development site is not subject to landscape designations. There are a number of landscape designations within the wider study area that would be subject to visibility of the proposed development, as depicted in Figure 6. These include:

- Wester Ross National Scenic Area (NSA), which is situated around 25 km to the west of the proposed development;

- Ben Wyvis Special Landscape Area (SLA), which, at its closest, is around 5 km to the east of the proposed development;
- Fannichs, Beinn Dearg and Glencalvie SLA, which, at its closest, is around 6 km to the north of the proposed development; and
- Strathconon, Monar and Mullardoch SLA, which is located around is around 13 km to the south west of the proposed development.

A description of the special qualities of NSAs is provided by Scottish Natural Heritage (SNH) (2010). Citations for the SLAs are set out in horner + maclennan's (2010) *Assessment of Highland Special landscape Areas*.

3.2.2.3.4 Garden and Designed Landscapes

There is one Gardens and Designed Landscape (GDL) within the study area that is subject to potential views of the proposed development. This is the Fairburn GDL (GDL00174), which is located around 13 km to the south east of the proposed development. Details of the key aspects of the GDL and reasons for its inclusion in the inventory of gardens and designed landscapes held by Historic Environment Scotland².

The LVIA will address both the effect of the development upon the character and amenity of the GDL, whilst the Cultural Heritage Chapter will address any effects on the historic qualities and context as well as the setting of the GDL.

3.2.2.3.5 Wild Land

The study area contains three Wild Land Areas (WLAs) comprising:

- Rhiddorochis, Beinn Dearg and Ben Wyvis WLA, which, at its closest, is around 3 km to the north east of the proposed development;
- Central Highlands WLA which is around 11 km to the south of the proposed development; and
- Fisherfield, Letterewe, Fannichs WLA, approximately 3 km top the west of the proposed development.

A description of each WLA is provided by SNH³.

3.2.2.3.6 Key Visual Receptors

The ZTV in Figure 4 indicates that the proposed development would have a relatively constrained viewshed which largely avoids the more settled glens and straths that also contain the main communication and transportation corridors. Key receptors that would be subject to views of the proposed development could include:

- Residents of a comparatively small number of scattered/individual properties and farmsteads;
- Key roads, including the A835 and A832;
- The Kyle of Lochalsh to Dingwall railway;
- Users of recreational routes, including strategic trails and cycleways and core paths; and

² Link: <http://portal.historicenvironment.scot/designation/GDL00174>. [interrogated February 2018.]

³ Link: <https://www.nature.scot/wild-land-area-descriptions> [interrogated February 2018.]

- Key summits and routes used by hill walkers.

3.2.2.4 Method of Assessment

3.2.2.4.1 Study area

The study area proposed for the purposes of the LVIA will be the equivalent of a 40 km radius from the outermost of the proposed developments turbines. This accords with current guidance, as set out in 3.2.2.4.2, below.

3.2.2.4.2 Guidance

The LVIA would be undertaken in accordance with the following guidance and standards:

- Landscape Institute (2017). *Technical Guidance Note 02/17. Visual representation of development proposals.*
- Landscape Institute and Institute of Environmental Management & Assessment, 2013. *Guidelines for Landscape and Visual Impact Assessment*, 3rd ed. Abingdon: Routledge.
- Scottish Natural Heritage (2001) *Guidelines on the Environmental Effects of Wind Farms and Small Hydroelectric Schemes.*
- The Countryside Agency and Scottish Natural Heritage (2002). *Landscape Character Assessment.*
- ETSU/DTI (2000) *A Guide to the Assessment of Cumulative Effect of Wind Farm Developments.*
- SNH (2012) *Guidance: Assessing the Cumulative Impact of Wind Farms.*
- Landscape Institute (2011) *Advice Note 01/2011: Photography and Photomontage in Landscape and Visual Assessment.*
- SNH (2017a) *Scottish Natural Heritage consultation on draft guidance: Assessing impacts on Wild Land Areas - technical guidance.*
- SNH (2017b) *Siting and Designing Wind farms in the Landscape Version 3.*
- SNH (2017c) *Visual Representation of Wind Farms – Guidance.*
- The Highland Council (2016) *Visualisation Standards for Wind Energy Developments.*

3.2.2.4.3 Landscape Impacts

The assessment of landscape impacts will address:

- Effects on landscape fabric;
- Effects on landscape character types;
- Effects on landscape designations;
- Effects on GDLs; and
- Effects on WLAs.

In the event that aviation lighting is required for the proposed development turbines the LVIA will address effects on the character of the landscape after dark.

3.2.2.4.4 Visual assessment

The LVIA will address effects on key visual receptors, including:

- Residents of settlements and scattered/individual properties;
- Key transportation routes, including the A835 and A832;
- Users of recreational routes, including strategic trails and cycleways and core paths; and
- Key summits and routes used by hill walkers.

Care will be taken to describe the extent of visibility of the proposed development, and effects on important connecting/linking views, sequential views, vantage points and prominent focal points. The assessment will also discuss what forms the basis of local visual amenity.

In the event that aviation lighting is required for the proposed development turbines the LVIA will address potential lighting effects in local amenity.

3.2.2.4.5 Significance of landscape and visual effects

Table 3, below, illustrates how residual effects are determined by comparison of the sensitivity of receptors with the magnitude of impacts/change. For the purposes of the LVIA significant landscape or visual effects will be defined as **major** or **major/moderate**. It should be noted, however, that the matrix is not intended to be applied in an arithmetical manner, but to act as a guide.

Table 3.1 Residual Effects

Sensitivity	Magnitude of Change/Impact				
	Substantial	Moderate	Slight	Negligible	None
High	Major	Major/Moderate	Moderate	Moderate/Minor	None
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor	None
Low	Moderate	Moderate/Minor	Minor	Minor	None

3.2.2.4.6 Mitigation

The LVIA will analyse of the siting and design of the proposed development, including ancillary elements. This will make reference to:

- Scottish Natural Heritage’s Siting and Designing Wind Farms in the Landscape 3; and
- The Highland Council’s Adopted Onshore Wind Energy Supplementary Guidance.

Based on this guidance, the findings of the baseline appraisal, field reconnaissance, and an analysis of potential sources of significant landscape and visual effects, a series of embedded and design measures will be identified and recorded in the LVIA and incorporated into a development description chapter.

A key consideration in the design of the proposed development is anticipated to be its juxtaposition to the consented Corriemoillie and Lochluichart Wind Farms.

3.2.2.4.7 Provisional viewpoint list

A preliminary list of assessment viewpoints has been produced (see Table 3.2, below, and Figure 4). These were identified with reference to the preliminary Zone of Theoretical Visibility drawing (ZTV) and were selected to represent key sensitive landscape and visual receptors distributed throughout the study area. Their selection also takes account of potential cumulative visibility, having reference to the LVIA's carried out for the neighbouring projects.

Table 3.2: Provisional List of Viewpoints

Viewpoint No.	Viewpoint Name	Approximate Distance/ Direction from Proposed Turbines	Grid Reference	Receptors and Reason for Selection
1	Aultguish Inn, A835	1.6 km N	235173, 870404	Tourists, road users, patrons of the Inn, some of whom may also use this location and nearby laybys as a commencement point for accessing the surrounding areas. This viewpoint is located on the boundary between the Rounded Hills and Undulating Moorland LCTS.
2	A835 Black Bridge	1.8 km N	237351, 870812	Tourists, road users and nearby walkers on the private road leading into Strathvaich estate and into the adjoining Fannich range and the Fannichs, Beinn Dearg and Glancalvie SLA. This viewpoint is located on the boundary between the Rounded Hills and Undulating Moorland LCTS.
3	Old Drovers Road, Corriemoillie	500 m SE	237582, 866846	Recreational receptors/walkers. This viewpoint is located in the Rocky Moorland LCT.
4	A835, near Tarvie	10 km SE	242343, 858941	Tourists, road users. This viewpoint is located on the edge of the Rocky Moorland LCT overlooking Loch Garve.
5	A832 Gorstan	4.8 km SE	238473, 862660	Tourists, road users and nearby walkers in Strathgarve. Views of Ben Wyvis and Little Wyvis as well as Corriemoillie. This viewpoint is located on the edge of the Rocky Moorland LCT overlooking Loch Garve.
6	Summit of Sgurr Marcasaidh	7.1 km S	235400, 859290	Recreational receptors/hill walkers. This viewpoint is representative of the Rocky Moorland LCT.
7	Summit of Ben Wyvis	8 km E	246304, 868380	Recreational receptors/hill walkers in Ben Wyvis SLA and Rhiddorochis, Beinn Dearg and Ben Wyvis WLAs. This viewpoint is representative of the Rounded Hills LCT at Ben Wyvis.
8	Avenue of Fairburn Estate	17 km SE	247778, 853026	Tourists/visitors to the estate and GDL. This viewpoint is also representative of the Forest Edge Farming and Enclosed Farmed Landscapes LCTs.

Viewpoint No.	Viewpoint Name	Approximate Distance/ Direction from Proposed Turbines	Grid Reference	Receptors and Reason for Selection
9	Summit of Creag Ruadh, near Milton	15.5 km SW	227681, 853930	Hill walkers in the Strathconon, Monar, Mullardoch SLA and Rounded Hills LCT.
10	Summit of Beinn a' Bhathaich	23 km S	236200, 843400	Hill walkers in the Central Highlands WLA and the Rugged Massif LCT.
11	Sgurr a' Choire Ghlais	26 km SW	225881, 843042	Hill walkers in the Strathconon, Monar, Mullardoch SLA and in the Central Highlands WLA, and the Rugged Massif LCT.
12	Summit of Moruisg	31 km SW	210200, 850000	Hill walkers in the Strathconon, Monar, Mullardoch SLA, the Central Highlands WLA, and the Rounded Hills LCT.
13	Leathad Buidhe, Beinn Eighe NNR	36 km WSW	199302, 863297	Hill walkers in the Flowerdale, Sheildaig and Torridon WLA, and in the Rugged Mountain Massif LCT.
14	Summit of An Coileachan, Fannich range	11 km W	224162, 868027	Hill walkers in the Fannichs, Beinn Dearg and Glancalvie SLA and the Fisherfield, Letterewe, Fannichs WLA, and in the Rugged Mountain Massif LCT.
15	Summit of Beinn Dearg	16 km NW	225963, 881199	Hill walkers in the Fannichs, Beinn Dearg and Glancalvie SLA, the Rhiddorochis, Beinn Dearg and Ben Wyvis WLA, and the Rugged Mountain Massif LCT.
16	Summit of Beinn à Chaisteil	11 km N	236991, 880104	Hill walkers in the Fannichs, Beinn Dearg and Glancalvie SLA, the Rhiddorochis, Beinn Dearg and Ben Wyvis WLA, and the Rounded Hills LCT.
17	Summit of Meall Mor	15 km NE	251500, 874500	Hill walkers in the Rhiddorochis, Beinn Dearg and Ben Wyvis WLA, and the Rounded Hills LCT.
18	Layby, Loch Glascarnoch	5 km NW	230300, 872800	Tourists, road users, patrons of the Inn, some of whom may also use this location and nearby laybys as a commencement point for accessing the surrounding areas. This viewpoint is located on the boundary between the Rounded Hills and Undulating Moorland LCTS.

3.2.2.4.8 Cumulative assessment

Scope of the cumulative assessment

The LVIA will assess cumulative effects (both additional effects and in combination effects) with regard to:

- Existing/operational and consented wind farm developments; and
- Proposed wind farm developments (principally those subject to a registered planning application or ongoing/undecided appeal); and
- Developments currently at scoping where there is adequate certainty regarding the layout and design of the scheme, and where an application is expected during prior to or shortly after the submission of the application for the proposed development.

Cumulative schemes outwith the study area will be considered, but only included in the list of cumulative schemes addressed in the LVIA where they are considered to contribute to potentially significant cumulative effects.

Figure 7 includes the developments known at the time of this scoping submission and includes:

- Corriemoillie (Consented);
- Lochluichart - (Existing/Operational);
- Lochluichart Extension - (Existing/Operational);
- Lochluichart Extension II – (In Scoping);
- Novar (Meall an Tuirc) (Existing/Operational);
- Novar (Meall and Tuirc Extension - (Existing/Operational);
- Braemore – (Consented);
- Rosehall – (Existing/Operational);
- Achany Estate – (Existing/Operational);
- Bhlaraidh – (Consented);
- Fairburn – (Consented);
- Garvary – (In Scoping); and
- Drum Ba – (Proposed).

However, a finalised list of schemes for inclusion in the LVIA will be prepared in consultation with THC and SNH and with reference to THCs online database, which is recognised as providing a reliable source of such information.

The cumulative assessment will address the additional and 'In-Combination' effects, as well as simultaneous, concurrent, and sequential effects of the proposed development, and will discuss the capacity of the landscape and its ability to accommodate the proposed development.

3.2.3 Cultural Heritage and Archaeology

3.2.3.1 Introduction

An assessment of the proposed development on the historic environment (including cultural heritage and archaeology) will be undertaken. This will involve consideration of both direct and indirect effects on known and potential receptors.

3.2.3.2 Initial Consultation(s)

Pre-application advice and consultation has been sought from the Highland Council, the Highland Council Historic Environment Team (HET) and Historic Environment Scotland (HES). Key issues raised are as follows:

- There are multiple Historic Environment Records (HER) within and adjacent to the project area;
- The Cultural Heritage chapter of an EIA report will need to be undertaken by a professional and competent historic environment consultant following Highlands Council Standards for Archaeological Work.
- A walkover survey of the development area will be necessary to assess the survival of any upstanding features.
- The assessment must consider both direct and indirect impacts, including cumulative impacts.
- Where impacts are unavoidable, HET expect proposed methods to mitigate this impact to be discussed in detail, including both physical (i.e. re-design) and where appropriate, compensatory/off-setting.
- The EIA should assess the impact of the proposed development on designated assets of interest to HES within the wider vicinity of the project area.

Further consultations will be undertaken with HES' Development Assessment Team and HET, regarding the scope and extent of cultural heritage and archaeology assessment as part of the EIA.

3.2.3.3 Summary of Baseline Environment

The summary below is based on a preliminary review of the historic environment baseline of the project area and its surroundings, including a site visit by an RSK archaeologist.

There are no designated (statutorily-protected) heritage assets within the project area. The nearest is the Category B listed Conon Valley Hydro Electric Dam (LB No. 51706), located 800 m to the west.

The nearest scheduled monument is the bridge over Black Water at Little Garve (SM No. 2720). It is located towards the bottom of a narrow strath 4.8 km to the southeast of the project area and lies outwith the zone of theoretical visibility (ZTV), as demonstrated by Figure 4.

In terms of the wider area, there are relatively few designated heritage assets. A complex of prehistoric settlements and chambered cairns at Strath Sgitheach (e.g. SM

No. 4728 and SM No. 2312) are located over 15 km to the southeast, and the scheduled fort of Carn na Buaile (SM No. 11056) is located 8 km to the south.

In terms of non-designated assets recorded within the Highland Council Historic Environment Record (HER), the farmstead of Kirkan/Kirkant (HER No. MHG8328) is located within the project area. The former road between Ullapool and Contin (MHG53677) also crosses the project area from the Aultguish Inn to Little Garve Bridge (Photograph 3 in Appendix 2).

There are further records for known heritage assets around the periphery of the project area, including the footings of an old bridge for the former road between Ullapool and Contin across the Allt Guibhais Beag (MHG29869), three undated enclosures near the Glascarnoch River (e.g. MHG8331), and the farmstead or township of Lubfearn (MHG33678) (still extant) (Photograph 4 in Appendix 2). These are likely to date from the post-medieval period. At Inchbae Lodge, there is a claim of a Roman camp and a more recent burial ground (MHG32199); however, trial trenching of the area in advance of a housing development in 2007 revealed no such remains.

3.2.3.4 *Potential Impacts*

The potential impacts are summarised below:

- Construction impacts (direct, visual or indirect) on both designated and non-designated heritage assets;
- Construction impacts upon previously unrecorded heritage assets; and
- Operational impacts (primarily indirect) on the settings of designated heritage assets (principally Scheduled Monuments, HGDLs, Conservation Areas and listed buildings).

3.2.3.5 *Method of Assessment*

The proposed assessors of the cultural heritage and archaeological impacts are a Registered Organisation (RO) with the Chartered Institute for Archaeologists (CIfA) and will undertake the EIA in accordance with CIfA *Standard and Guidance for Historic Environment Desk-Based Assessments* (2014b) and *Code of Conduct* (2014a).

Work will also be undertaken in accordance with the Highland Council Historic Environment Team (HET) standards for archaeological work (Highland Council, 2012).

The first stage of the planned work will involve establishing the historic environment baseline of the project area. This will inform the impact assessment, involving an assessment of likely significant effects to the historic environment, comprising direct, visual and indirect effects.

Subject to the outcome of the scoping and initial consultation process, the methodology is detailed below.

The aims of the baseline data-gathering stage would be:

- To establish, from documentary sources, the known heritage assets in the project area and its surroundings;
- To assess, from existing sources, the potential for the presence of previously unknown heritage assets in the project area; and

- To assess the importance of the identified heritage assets which may be affected.

The aims of the EIA would be:

- To assess the development impact magnitude as a result of the proposed development on individual heritage assets and the historic environment;
- To assess the significance of effect (direct, visual and indirect) of the proposed development on the known and potential historic environment constraints; and
- To recommend appropriate measures to mitigate the identified effects.

Consultation would be undertaken with the consultation bodies to establish whether or not further assessment and mitigation is necessary.

The results of the assessment would be presented in the collated EIA Report.

To consider direct impacts, data will be gathered for a study area of the footprint of the proposed development and a 1 km buffer from the edge of the project area. Data will be gathered from the following sources:

- The Highland Council Historic Environment Record (HER); consulted for lists of known heritage assets and previous archaeological interventions;
- Historic Environment Scotland's (HES) databases of Listed Buildings, Scheduled Monuments, Inventory Battlefields, Conservation Areas, Historic Gardens and Designed Landscapes and monuments proposed for scheduling;
- The National Record of the Historic Environment (NRHE) and Historic Landscape Characterisation Areas;
- Relevant Landscape and Visual assessment data, such as the Zone of Theoretical Visibility (ZTV);
- Vertical stereo aerial photographic coverage held by the National Collection of Aerial Photography (NCAP) and more recent sources (e.g. Google Earth);
- Conservation Area designations, landscape designations, Tree Preservation Orders (TPOs) or other designations which may affect the scope of archaeological works, such as the existence of ancient or significant tree cover;
- Ordnance Survey map coverage from 1850 onwards, and any other readily available early cartographic sources held at the National Library of Scotland Map Library;
- Accessible relevant documentary information held by the Strathvaich Estate; and
- Bibliographic references, early parish accounts and the Ordnance Survey Name Books.

An archaeological walkover survey will be undertaken for the area of the proposed wind farm array and access tracks to consider the condition of identified heritage assets to determine the potential for the presence of previously unrecorded assets and to comment on past and present land use.

To consider visual impacts, data will be gathered for up to a 15 km buffer from the boundary of the project area, beyond which it is considered unlikely that any effects

would be significant, to allow for an assessment of impact on the settings of designated sites, in consultation with HET and Historic Environment Scotland. Data will be gathered from Historic Environment Scotland's databases of Category A Listed Buildings, Scheduled Monuments, Inventory Battlefields, Historic Gardens and Designed Landscapes, monuments proposed for scheduling.

Cultural heritage receptors within the ZTV will be identified and visited to assess any potential impacts to setting. Cumulative assessment of the impact on cultural heritage receptors will also be considered and reported upon in the EIA report.

Results would be in an EIA report chapter that will include a discussion of the known and potential heritage assets within the project area, supported by constraints mapping and a gazetteer of known heritage assets. It will present an assessment of direct impacts concentrating on the footprint of the proposed development, and an assessment of setting impacts (sight lines, monument inter-visibility and landscape setting). Details of proposed mitigation measures will be included, alongside consideration of residual effects.

Following completion and submission of the EIA report, a digital shapefile of the survey area will be supplied to HET, alongside relevant information obtained through the baseline data-gathering stage of the EIA.

3.2.3.6 *Key issues for consideration in the EIA*

Careful consideration of the impacts of setting (in particular in relation to the spatial relationship with the adjacent Lochluichart and Corriemoillie Wind Farms) and the siting of access tracks, turbines and ancillary infrastructure will be necessary to ensure a robust design to take forward.

3.2.4 **Ecology**

3.2.4.1 *Introduction*

This section provides a summary of baseline (non-avian) ecological information collected to date, and that proposed to inform the EIA of the proposed development. An overview of potential impacts to be addressed within the EIA report is also provided. All field surveys and subsequent assessment will be undertaken by suitably qualified, experienced and competent ecologists, with full details provided within the EIA report.

3.2.4.2 *Initial Desk Study*

An initial desk study was undertaken in 2016 to inform the proposed approach to baseline ecological and ornithological surveys.

The desk study took into account the following applicable at the time:

- Proximity to statutory designated sites for nature conservation⁴;
- SNH general pre-application/scoping advice to developers of onshore wind farms applicable at the time (SNH, 2015);
- Good practice SNH guidance on protected animals with relation to developments⁵;

⁴ SNH Sitelink, available at: <http://gateway.snh.gov.uk/sitelink/>

- EIA documents for the Corriemoillie Wind Farm (E.ON, 2010) and Post Consent Reports (e.g. Amec, 2015);
- Request to the Highland Biological Records Group (HBRG); and,
- Existing knowledge of ecology of the general wider area.

In addition, a walkover of the project area was undertaken by an ecologist in March 2016. Further desk-based study will be undertaken as part of the EIA (see Section 3.2.4.7).

3.2.4.3 *Initial Consultation(s)*

Prior to the commencement of baseline ecological surveys, consultation with SNH was undertaken in August 2016 to outline and agree the scope of baseline ecological surveys proposed and to obtain any additional comments.

Consultation has since also been undertaken with Scottish Wildcat Action (SWA), who have provided additional species records for the general area and advice on the approach to species-specific surveys.

3.2.4.4 *Initial Field Surveys*

3.2.4.4.1 Phase 1 Habitat Survey

A Phase 1 habitat survey was undertaken in July 2017 by Avian Ecology Ltd. following industry standard survey guidance (JNCC, 2010).

The survey area comprised the project area and accessible areas within 250m of the project area boundary in order to comply with SEPA guidance (2014) with respect to ground water dependent terrestrial ecosystems (GWDTE).

Areas north of the A835 were excluded and where it was not possible to directly access habitats beyond the Strathvaich Estate landholding, habitat mapping was aided by way of aerial imagery and knowledge of habitats within the project area.

3.2.4.4.2 National Vegetation Classification (NVC) Survey

An NVC survey was also undertaken in July 2017 following industry standard survey methodology (Rodwell, 2006).

The survey area comprised all potential UK Biodiversity Action Plan (UK BAP⁶) habitat types and habitat types listed on Annex 1 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (i.e. Habitats Directive), identified within the Phase 1 habitat study area.

3.2.4.5 *Preliminary Environmental Baseline*

Full details and findings of desk studies and field surveys will be presented within the EIA report. A brief summary of key findings to date is provided below.

⁵ SNH Advice, Planning and Development: Protected Animals, available at: <https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-animals>

⁶ Further information available at: <http://www.gov.scot/Topics/Statistics/Browse/Environment/TrendBAP>

3.2.4.5.1 Designated Sites for Nature Conservation

There are no non-statutory designated (local) sites identified within 2 km of the project area. Statutory (international and national) designated sites located within 5 km of the project area are shown in Figure 3 and summarised in Table 3.3.

The nearest statutory designated site comprises the Ben Wyvis National Nature Reserve (NNR), Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

Table 3.3: Designated sites for nature conservation within 5km of the project area.

NNR – National Nature Reserve; SSSI – Site of Special Scientific Interest; SAC – Special Area of Conservation.

Site Name	Approximate distance to project area (km)	Qualifying Interests
Ben Wyvis NNR	2.5 (west)	<ul style="list-style-type: none"> • Breeding Dotterel <i>Charadrius morinellus</i> • Upland Habitats • Geology
Ben Wyvis SSSI	4.3 (west)	<ul style="list-style-type: none"> • Breeding Dotterel • Blanket Bog • Dystrophic and oligotrophic lochs • Quaternary of Scotland • Upland Assemblage of Habitats • Vascular Plant Assemblage
Ben Wyvis SAC	4.3 (west)	<ul style="list-style-type: none"> • Alpine and Boreal heaths • Blanket bogs • European dry heaths • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels • Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>IsoëtoNanojuncetea</i> • Siliceous alpine and boreal grasslands • Siliceous rocky slopes with chasmophytic vegetation • Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>).

3.2.4.5.2 Habitats and Vegetation

The project area predominantly comprises a mix of blanket bog, wet heath and mire habitats (Figure 9), with a small area of mixed (birch-coniferous) plantation woodland.

Several shallow watercourses intersect and drain the project area including Allt Giubhais Beag, Allt Glac an t-Sithein, Feith Bhaite, Allt Bad an t-Seabhaig, which flow into the Glascarnoch River, Black Water and eventually the River Conon.

Mature coniferous woodland borders the project area to the south, east and west. The A835 borders the project area to the north, beyond which further expanses of open moorland habitats occur within the wider Strathvaich Estate.

The heathland habitats within the project area are characterised by NVC communities M17 *Trichophorum cespitosum-Eriophorum vaginatum* blanket mire, M15 *Trichophorum*

cespitosum-Erica tetralix wet heath and a small area of M6 *Carex echinata* – *Sphagnum fallax* mire.

The M15 and M17 NVC communities correspond to Habitats Directive Annex I habitat types “European wet heath” and “Active raised bog and blanket bog” respectively, which are relatively widespread and ubiquitous across the North West Highlands of Scotland.

No protected flora species have been recorded.

3.2.4.5.3 Protected and Notable Species

Surveys for protected and notable species will be undertaken in 2018. Details of proposed survey methodologies are provided in Section 3.2.4.7.

The moorland habitats of the project area and surrounding afforested areas are likely to support an associated terrestrial mammal assemblage that could include pine marten *Martes martes*, red squirrel *Sciurus vulgaris*, and red deer *Cervus elaphus*. Existing records of badger *Meles meles* were also returned from the HBRG for the surrounding area and local wildcat records are held by SWA. The Strathpeffer Wildcat Priority Area is located approximately 5km to the south east of the project area.

Watercourses within and intersecting the project area provide suitable opportunities for otter *Lutra lutra* and water vole *Arvicola amphibius* and there is potential for fish spawning habitat also. The River Conon is a designated salmonid fishery under the Freshwater for Fish Directive (78/659/EEC).

Existing records of common lizard *Zootoca vivipara*, common toad *Bufo bufo*, palmate newt *Lissotriton helveticus* and common frog *Rana temporaria* have also been identified locally and habitats within the project area are likely to support such a suite of common herptiles. Adder *Vipera berus* may also be present.

No existing bat records were returned by the HBRG.

3.2.4.6 Potential Impacts

Potential adverse impacts upon ecological features to be assessed within the EIA report which could arise during the construction, operational and decommissioning phases of the proposed development and are summarised below.

Impacts will be assessed and informed on the basis of baseline study findings and through consultation with relevant specialist groups as required.

Potential impacts upon Ground Water Dependent Terrestrial Ecosystems (GWDTEs), peat and forestry will be addressed separately as discussed within Sections 3.2.7 and 3.2.12.1 respectively.

The potential for impacts as a result of possible influences on deer behaviour from the proposed development will also be considered within a separate Deer Assessment (see Section 3.2.4.8).

3.2.4.6.1 Construction

During construction of the proposed development, in the absence of mitigation, impacts upon ecological features to be addressed within the EIA report may arise from:

- habitat loss, fragmentation or change as a result of the delivery and installation of development infrastructure; and,
- disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places.

There will be no direct impacts on any designated site for nature conservation. The potential for impacts on mobile qualifying interests will however be assessed, including those on birds as discussed in Section 3.2.5.

The potential for indirect impacts upon ecological features as a result of the potential spillage and/or mitigation of pollutants during the construction phase will be considered, however potentially significant effects will be highly unlikely on the basis of embedded mitigation measures (see Section 3.2.4.9) below.

3.2.4.6.2 Operation

During operation of the proposed development, in the absence of mitigation impacts upon ecological features to be addressed within the EIA report may arise from:

- disturbance to protected or otherwise notable species as a result of operational activities such as vehicular traffic and maintenance works;
- habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage and/or mitigation of pollutants; and,
- interaction of bats with operational turbine blades leading to mortality due to collision or barotrauma.

3.2.4.6.3 Decommissioning

Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

3.2.4.7 Method of Assessment

3.2.4.7.1 Baseline Studies

Full details of baseline studies, field surveys and consultations will be provided within the EIA report. Appropriate survey areas will be adopted, and updated over the course of the EIA to account for any development infrastructure design changes as necessary and where permitted land access allows.

Desk Study

Further desk study will be undertaken in order to inform the EIA. The desk study will seek to obtain additional existing information for protected/notable species within 2km (10km for bats) from the project area. The following recording groups will be contacted:

- HBRG;
- Scottish Badgers; and,
- Cromarty Firth Fishery Board.

Protected Species Survey(s)

The following species-specific surveys will be undertaken:

Pine Marten

The most suitable habitats for pine marten are located within mature forestry stands surrounding the project area however, some use of the open moorland habitats within the project area is also possible.

A survey for pine marten will be undertaken as per SNH guidance (2017d) with reference to good practice survey methodologies (VWT, 2010 and Cresswell *et al.*, 2012). The survey area will comprise the project area.

Wildcat

Consultation with SWA has identified existing species records within proximity to the project area. As such, it is considered that there is potential for the species to be present locally.

An initial walkover survey of the project area will be undertaken to assess the suitability of habitats for wildcat, identify prey species, possible field signs and den sites in accordance with good practice survey methodologies (SNH, 2017e and Cresswell *et al.*, 2012) with reference to species-specific advice (e.g. Daniels *et al.*, 2001 and MacDonald *et al.*, 2004) and inform the requirement for further surveys.

Badger

Sett building opportunities for badgers are primarily present within mature forestry stands surrounding the project area, although badgers often use open moorland habitats.

A walkover survey for badgers will be undertaken as per SNH guidance (SNH, 2017c) with reference to good practice survey methodologies (Harris *et al.*, 1989). The survey area will comprise the project area.

Otter

Watercourses within and intersecting the project area are considered to provide good foraging and holt building opportunities for otter. Larger waterbodies within the surrounding wider area also have the potential to support the species.

A walkover survey for otters will be undertaken as per SNH guidance (SNH, 2017g) with reference to good practice survey methodologies (e.g. Chanin, 2003). The survey area will comprise suitable habitat features within the project area.

Water Vole

Watercourses within and intersecting the project area show good habitat suitability for water vole and the species is likely to be present.

A survey for water voles will be undertaken as per SNH guidance (SNH, 2017h). The survey area will comprise all water course sections within the project area. The survey will be undertaken with reference to good practice survey methodologies (Strachan *et al.*, 2001 and Dean *et al.*, 2016).

Red Squirrel

Habitats suitability for red squirrels within the project area is limited, with more favourable foraging and drey building opportunities provided within adjacent mature forestry stands.

A survey for red squirrels will however be undertaken as per SNH guidance (SNH, 2017i) with reference to good practice survey methodologies (Gurnell *et al.*, 2009). The survey area will comprise suitable habitat features for red squirrel within the project area.

Bat Surveys

Current BCT guidelines in relation to bats and wind farms (Hundt, 2012), recommends that the approach to baseline surveys should be based on whether a site is likely to be of low, medium or high risk for bats. Risk level is initially assessed by considering the presence of potential roosting features, the quality of foraging habitat, and the connectivity of a site to the wider landscape.

The project area is currently considered to be 'low risk' following the criteria set out in the BCT guidelines, supporting limited roosting opportunities and only low quality open foraging habitat.

Surveys for bats will therefore be undertaken in accordance with BCT recommended effort for a low risk site using a combination of ground level transect and automated activity surveys at ground level using static detectors. Surveys will be undertaken over the course of three survey periods comprising spring, summer and autumn. The study area will comprise the project area.

Pending initial survey results, such as the identification of high risk species, the survey approach will be reviewed in accordance with BCT guidance and consultation with SNH as necessary.

Ground-level Transect Surveys

Surveys will include a combination of both dawn and dusk surveys and will entail surveyors walking a defined transect route through the study area, taking in a representative range of habitats present.

Automated Activity Surveys at Ground Level

Surveys will comprise the deployment of static bat monitoring equipment for a minimum of five consecutive nights at defined monitoring locations.

Monitoring locations will be identified on the basis of turbine locations, or if not known, the likely main turbine clusters, with additional deployment to ensure representative habitat coverage within the study area.

Recording at height is not proposed given the likely low value of the project area to bats.

Bat Roost Suitability Survey

A ground level survey for suitable roost features within the study area will also be undertaken in accordance with current BCT guidance (2016) and inform the requirement for further surveys (e.g. presence/absence surveys).

Fish Habitat Surveys

The Black Water is a tributary of the River Conon, a designated salmonid fishery.

A fish habitat assessment will be undertaken of all watercourses intersecting the project area following industry standard guidance (SFCC, 2007) extended to include the suitability of habitats for freshwater pearl mussel *Margaritifera margaritifera*.

The requirement for further detailed fish surveys will be confirmed in consultation with SNH following completion of the fish habitat assessment and review of any existing data made available by the Cromarty Firth Fisheries Board.

Additional Field Surveys

In accordance with SNH guidance (2015) there are some species groups which, providing the implementation of suitable mitigation measures, are unlikely to be subject to significant effects as a result of wind farm developments. As such, they do not require surveys to inform an EIA. This includes invertebrates, reptiles and amphibians but excludes additional European Protected Species.

The only additional European Protected Species with some potential to be present within the project area and locality is great-crested newt *Triturus cristatus* however, no suitable waterbodies for the species have been identified within the project that would likely be directly impacted by the proposed development.

No additional field surveys are therefore proposed.

3.2.4.7.2 Assessment of Effects

Impact assessment presented within the EIA report for ecological and ornithological features will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (2016).

The process assessment process will include the following stages:

- determination and evaluation of important ecological features;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects; and,
- identification of opportunities for ecological enhancement.

The following key pieces of legislation, policy and guidance will be referred to:

European

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (codified version of Directive 79/409/EEC as amended) (Birds Directive);

National

- The Habitat Regulations 1994 (as amended) and The Conservation of Habitats and Species Regulations 2010, as amended in Scotland (hereafter referred to as the 'Habitat Regulations');
- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;

- The Nature Conservation (Scotland) Act 2004;
- Protection of Badgers Act 1992;
- The National Planning Policy Framework 3 (2014);
- Scottish Planning Policy (2014);
- Scotland’s Biodiversity: It’s in Your Hands (2004);
- 2020 Challenge for Scotland’s Biodiversity (2013);
- Scotland’s Biodiversity – a route map to 2020 (2015);
- The United Kingdom Biodiversity Action Plan (UK BAP) Priority Species and Habitats (2007);
- Scottish Biodiversity List (SBL) 2013;
- Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas (SNH, 2018);
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012);
- Assessing Connectivity with Special Protection Areas (SPAs) (SNH, 2016a);

Local

- The Highland Biodiversity Action Plan 2015 – 2020 (LBAP);
- Highland-wide Local Development Plan (2017);
- Highland Council Onshore Wind Energy Supplementary Guidance (2016); and,
- Highland Statutorily Protected Species – Supplementary Guidance (2013).

Determining Importance

The assessment within the EIA report will only assess in detail impacts upon important ecological and ornithological features i.e. those that are considered important and potentially significantly affected by the proposed development. A detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts will not be undertaken and justification for “scoping out” provided.

Relevant European, national and local legislation policy and guidance will be referred to in order to determine the importance (or ‘sensitivity’) of ecological features. In addition, importance will also be determined using professional judgement, specialist consultation advice and the results of baseline surveys and the importance of features within the context of the geographical area.

Importance will not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

The importance of an ecological features will be defined in a geographical context from “Local” to “International”.

Identification and Characterisation of Impacts

The identification and characterisation of impacts on important ecological feature will be undertaken in accordance with the CIEEM guidelines with reference made to magnitude (e.g. area or number of individuals to be impacted), extent, duration and reversibility as appropriate.

Impacts will be considered during the construction, operational and decommissioning phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures are implemented.

Significant Effects

CIEEM guidelines define a 'significant effect' as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

CIEEM guidelines on ecological impact assessment note that "*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process.*"

Potentially significant effects identified will be expressed with reference to an appropriate geographic scale. For example a significant effect on a nationally designated site is likely to be of national significance. However, the scale of significance does not necessarily always relate to the importance of an ecological feature. For example an effect on a species which is considered of national importance, may not have a significant effect upon its national population.

In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged.

Residual Effects

Where the EIA proposes measures to mitigate potentially significant adverse effects on ecological features, a further assessment of residual ecological effects, taking into account any ecological mitigation recommended, will be undertaken.

Cumulative Impacts

The potential for cumulative impacts with other wind farm proposals will be assessed in accordance with SNH guidance (2012) but with regards ecological features will be restricted to those developments located within the same hydrological catchment(s) or within the regular range of mobile species (e.g. bats).

The assessment will encompass the effects of the proposal in-combination with existing developments, either built or under construction; approved developments, awaiting implementation; and, proposals awaiting determination within the planning process with design information in the public domain.

The inclusion of additional non-wind farm proposals will also be included upon request from SNH.

3.2.4.8 Deer Assessment

Although not likely to be of significant nature conservation importance an assessment of the potential impacts on deer welfare, habitats, and other interests (e.g. access and

recreation, road safety, etc) will be included in accordance with current SNH guidance (2016b).

The objectives of the assessment will be to:

- outline baseline information pertaining to deer and deer management within the project area; and,
- identify potential issues and impacts on deer arising from the proposed scheme.
- The assessment will be prepared following consultation with the local deer management group(s).

3.2.4.9 Mitigation

The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features will be part of the iterative design process for the proposed development.

Measures to avoid or otherwise minimise potentially adverse impacts upon ecological features during scheme design will include:

- Land-take
Development infrastructure will be designed to minimise the requirement for land-take and the number of watercourse crossings.
- Watercourse crossings
New watercourse crossings required will be designed in accordance with best practice and enable the free passage of fish and other wildlife.
- Watercourse Buffers
A minimum 50 m buffer between scheme infrastructure will be applied around all watercourses in so far as possible having regard to other ecological and non-ecological constraints.
- Construction Environmental Management Plan
A Construction Environmental Management Plan (CEMP) (or similar) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current guidance.
- Bat Habitat Features
A minimum 50 m buffer (from blade tip) will be applied to key bat habitat features to avoid potential operational mortality risks to bats in so far as possible, having regard to other ecological and non-ecological constraints.

Full details of embedded mitigation measures in relation to ecology will be detailed within the EIA report.

3.2.4.10 Enhancement

Suitable principles for biodiversity enhancement to be delivered as part of the proposed development will be outlined within the EIA report. The appropriateness and feasibility of principles will be confirmed with SNH and relevant consultees as necessary over the course of the EIA, with view to prescriptive enhancement measures being detailed post-consent within a Habitat Management Plan (HMP).

3.2.4.11 *Presentation of Sensitive Information*

Ecological data considered sensitive (e.g. that pertaining to badger sett locations) will be included in a confidential appendix to the EIA Report. This will not be made publically available, but will be issued to SNH.

It will be ensured that sufficient information is presented within the EIA Report to allow an objective and robust assessment of potentially significant adverse impacts upon ecological features to take place.

3.2.5 **Ornithology**

3.2.5.1 *Introduction*

This section provides a summary of baseline ornithological information collected to date, and that proposed to inform the EIA of the Kirkan Wind Farm development. An overview of potential impacts to be addressed within the EIA Report is also provided.

All surveys will be completed by suitably experienced and, where necessary, licensed surveyors following current SNH guidance (2014). Full details will be provided within the EIA report.

3.2.5.2 *Initial Desk Study*

An initial desk study was undertaken in 2016 to inform the proposed approach to baseline ecological and ornithological surveys as outlined in Section 3.2.4.2.

In addition, with regards ornithological features, the desk study at that time took into account:

- current SNH guidance (2014) on bird survey methods at onshore wind farms; and,
- an information request to the Highland Raptor Study Group (HRSRG).

Subsequently additional information requests were also submitted and obtained from the RSPB in 2017.

3.2.5.3 *Initial Consultation(s)*

Prior to the commencement of ornithological baseline surveys, consultation with SNH and RSPB was undertaken in August 2016 to outline and agree the scope of baseline ornithological surveys proposed and to obtain any additional comments.

In summary, SNH outlined their agreement with the proposed scope and methodologies for baseline ornithological surveys, providing they were undertaken in accordance with their guidance.

SNH were subsequently also re-consulted following the completion of year 1 ornithological surveys to agree a revised approach to year 2 surveys, on the basis of year 1 findings.

In summary, SNH outlined their agreement with the proposed scope and methodologies for year 2 surveys but requested further monitoring of golden eagle territories, on the basis of existing desk study records.

Full details of consultations will be provided within the EIA Report.

3.2.5.4 Initial Field Surveys

In accordance with SNH guidance (2014) two years of ornithological surveys are required unless it can be demonstrated that a reduced survey effort is appropriate.

In this case, two breeding seasons will be surveyed on the basis of known and potential breeding ornithological sensitivities. Two wintering seasons will also be surveyed on the basis of potential sensitivities in relation to dispersing breeding golden eagle *Aquila chrysaetos*.

Baseline ornithological surveys to inform the proposed development commenced in September 2016 and remain in progress. This section therefore provides an overview of surveys undertaken between September 2016 and August 2017 (i.e. year 1 surveys), which have comprised:

- Flight activity vantage point (VP) surveys;
- Winter walkover surveys;
- Moorland breeding bird survey;
- Breeding raptor searches; and,
- Breeding black grouse surveys.

3.2.5.4.1 Flight activity VP surveys

Flight activity VP surveys to quantify the level and distribution of “at collision risk” flight activity for target species and to provide data for Collision Risk Models (CRMs) were undertaken in accordance SNH guidance (2014).

The survey area comprises the project area, extended to 500m from the project area boundary.

Four VP locations were used to provide maximum coverage of the survey area. as listed in Table 3.4. Full details of viewshed areas will be provided within the EIA Report.

Table 3.4: VP locations

VP	Approximate Grid Reference
VP1	NH 37342 67547
VP2	NH 38329 70554
VP3	NH 35611 67192
VP4	NH 35796 70603

Year 1 VP survey effort is summarised in Table 3.5.

Current SNH guidance (2014) recommends a minimum survey effort of 36 hours in each breeding season and non-breeding season for each relevant target species, amounting to a total of 72 hours over a 12 month period.

A minimum of 111 hours of VP survey effort was subsequently obtained from each VP location, with a minimum of 36 hours in each breeding season and non-breeding season for relevant target species. VP survey times have been dispersed throughout the day and surveys have been completed in a range of weather conditions.

Each VP survey session has been no more than three hours in duration.

Table 3.5: VP survey effort – Year 1.

VP	Sep -16	Oct -16	Nov -16	Dec -16	Jan -17	Feb -17	Mar -17	Apr -17	May -17	Jun -17	Jul -17	Aug -17	Total
VP1	3	21	12	6	6	6	18	12	6	9	6	9	114
VP2	9	15	12	6	6	9	12	12	6	9	6	9	111
VP3	9	15	9	6	6	12	12	12	6	9	6	9	111
VP4	3	21	12	6	6	6	18	12	6	9	6	9	114

The following height bands within which to record target species flight activity are being used in the field to account for potential turbine candidates:

- HT1 0-25m;
- HT2 25-50m;
- HT3 50-75m;
- HT4 75-100m;
- HT5 100-125m;
- HT6 125-150m;
- HT7 150-175m; and,
- HT8 >175m.

Target species for flight activity VP surveys include all divers, swans, geese and ducks, raptors (all except common buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*), waders and black grouse *Tetrao tetrix*.

The activity of secondary species (including common buzzard, kestrel, sparrowhawk and additional notable species as observed) are also recorded in approximately 15 minute summary intervals, noting the number of birds present and general behaviour in order to build an overall picture of activity within the study area.

3.2.5.4.2 Migratory VP Surveys

In consultation in 2016 SNH commented “Based on the findings of the Lochluichart and Corriemoillie surveys there seems little need for additional migratory wildfowl surveys”.

Additional VP survey effort has however, been undertaken to account for the proximity of the proposed wind farm site to the Glen Affric to Strathconon Special Protection Area (SPA) and the potential for some levels of golden eagle activity to occur during the peak golden eagle display period (January to March) and the juvenile dispersal window (August to October). Coincidentally this also captures survey periods for migratory wildfowl and therefore migratory VP survey effort has also been completed

3.2.5.4.3 Winter walkover surveys

In consultation in 2016 SNH commented “Winter walkovers in this part of the Highlands tend not to provide much useful data but black grouse info might be useful”. As such,

winter walkovers were not considered to be a specific requirement to inform the proposed development however, they were considered likely to provide some useful information on the presence of black grouse prior to the commencement of breeding bird surveys in 2017. The potential presence of roosting raptors listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Annex 1 of the Birds Directive, was also considered on a similar basis.

Winter walkover surveys were therefore undertaken over the 2016/2017 wintering period and comprised four visits in; one in each of September, November, January and March.

The survey area comprised the project area extended to include accessible habitats within 500m of the project area boundary.

3.2.5.4.4 Moorland breeding bird survey

A moorland breeding bird survey (MBBS) was undertaken in Spring/Summer 2017 to obtain information on the numbers and distribution of moorland and open country species.

The survey was undertaken following an adapted Brown & Shepherd (1993) method, as per SNH guidance (2014), and comprised four staggered visits between April and July.

The survey area comprised the project area and accessible areas within 500m of the project area boundary.

Targeted Moorland Species Surveys

In consultation SNH commented “We don't consider there is any real connectivity between this site and the wood sandpiper and dotterel SPAs so no dedicated surveys needed.”

As such no targeted effort for these species is required. Evidence of either species presence within the project area would however be recorded during moorland breeding bird survey visits described above.

3.2.5.4.5 Breeding raptor searches

Searches for breeding diurnal raptors (including short-eared owls) were undertaken between March and August 2017 following techniques described in Hardey et al. (2009), as per SNH guidance (2014).

Over 60 hours of observations were made over eight staggered visits to the study area. The study area comprised the project area and observable areas out to 2km for all species and out to 6km for eagle species.

3.2.5.4.6 Breeding black grouse surveys

Searches for black grouse leks were undertaken in Spring 2017 within the project area and accessible areas out to 1.5km. Searches were undertaken in accordance with species-specific advice contained within Gilbert et al. (1998), as per SNH guidance (2014), conducted over several dates (to include preparatory visits) between the last week in March and mid-May.

3.2.5.4.7 Additional Surveys

SNH guidance (2014) recommends surveys for breeding divers (following the methods specified in Gilbert et al., 1998) are undertaken out to 1km of proposed wind farm developments.

Two small waterbodies, namely Loch Bad Leabraidh and Lochan Dubh Mor, are located within 1km of the project area. A further waterbody, Loch nam Breac, is located just beyond 1km of the wind farm site. The waterbodies lie to the south west, south and south east of the project area respectively and outwith access permissions for surveys. Following ground truthing, the waterbodies are also not viewable from lands with permitted access.

The presence of breeding divers within the wider surrounds, are understood to be established through baseline and ongoing operational monitoring surveys undertaken for the adjacent Corriemoillie and Lochluichart wind farm developments.

As such diver surveys have not been undertaken due to the acknowledged availability of existing data within the study area and access restrictions.

Following consultation in November 2017, on the basis of existing available data and absence of diver species activity recorded over the project area, SNH commented that any additional effort is not required.

3.2.5.5 Year 2 Field Surveys

SNH guidance (2014) stipulates “two years of survey will be required unless it can be demonstrated by the developer that a shorter period of survey is sufficient”.

On the basis of findings from a first year of surveys, a second year of the following surveys are being undertaken and will conclude in August 2018:

- Flight Activity VP Surveys;
- Moorland Breeding Bird Survey;
- Breeding Raptor Searches; and,
- Breeding Black Grouse Surveys.

Survey methods and effort will adopt a consistent approach as to those undertaken in Year 1.

In consultation in 2017 SNH commented that they were happy with survey proposals outlined to them for year 2, but advised additional effort to ascertain the occupation and breeding outcome of an identified golden eagle territory.

3.2.5.6 Preliminary Environmental Baseline

Full details and findings of desk studies and field surveys will be presented within the EIA report. A brief summary of key findings from year 1 surveys is provided below.

Due to the sensitivity of some ornithological information, full details of such records are not provided. The approach to the presentation of sensitive ornithological information within the EIA report is discussed in Section 3.2.5.11.

3.2.5.6.1 Designated Sites for Nature Conservation

The project area does not form part of any statutory or non-statutory designated site for nature conservation with ornithological features of interest.

There are no non-statutory designated (local) sites identified within 2km of the project area. Internationally designated sites with ornithological features of interests located within 10km of the project area are shown in Figure 3 and summarised in Table 3.6.

In accordance with SNH guidance (2016a) on assessing connectivity between development proposals and SPAs, there are no additional SPAs located within 20km of the project area for which migratory geese form a qualifying interest.

Table 3.6: Internationally designated sites with ornithological interests within 20km of the project area.

Site Name	Approximate Distance to Project Area	Qualifying Interests
Glen Affric to Strathconon SPA	5 km	Golden eagle (breeding)
Beinn Dearg SPA	6 km	Dotterel (breeding)
Ben Wyvis SPA	6 km	Dotterel (breeding)
Achanalt Marshes SPA	10 km	Wood sandpiper (breeding)

3.2.5.6.2 Existing Protected and Notable Species Records

HRSG

The HRSG were consulted in 2016 on the availability of existing breeding raptor records within 8km of the project area. A response was subsequently received in early 2017 regarding the presence of breeding red kite *Milvus milvus* and osprey *Pandion haliaetus*.

No records were returned from within the project area but records were subsequently used to inform breeding raptor searches within the wider surrounding area undertaken in 2017.

RSPB

A formal data request was submitted to the RSPB in January 2017 to obtain records of protected and notable species records within 3km of the project area, extended to include records of protected bird records within 8km.

Records were subsequently used to inform breeding bird survey in 2017, notably those for breeding black grouse.

Following comments received from SNH during consultation in November 2017, a further request was issued to RSPB, also in November 2017, for records arising from the 2015 Golden Eagle Survey within 8 km of the project area which had subsequently been made available.

3.2.5.6.3 Flight Activity Surveys

Target species flight activity recorded over a total of 450 hours of VP observations between September 2016 and August 2017 is summarised in Table 3.7 below. The total number of flights, total number of birds recorded and the total time spent (in seconds) in the VP survey area are presented.

Overall flight activity of target species were found to be very low relative to the survey effort completed. Full details of flight activity records together with illustrated flight lines will be presented within the EIA report.

Table 3.7: Target species flight activity summary – year 1.

Species	Total No. of Flights	Total No. of Birds	Total Time (seconds)
Whooper swan	3	8	335
Pink-footed goose	6	288	805
Greylag goose	6	321	953
Red kite	6	6	2,162
Hen harrier	1	1	136
Goshawk	1	1	45
Golden eagle	5	5	2,534
White-tailed eagle	1	1	670
Peregrine	4	5	521
Black grouse	4	4	73
Golden plover	6	7	413
Greenshank	2	2	83

3.2.5.6.4 Winter Walkover Surveys

Winter walkover surveys recorded a range of passerines typical of the open moorland and woodland habitats present within the study area, including common crossbill. Small numbers of black grouse were also recorded, identifying the species likely breeding presence within the study area.

No notable aggregations of migratory waterfowl were recorded and the open moorland habitats within the project area are considered highly unsuitable for such species.

Non-breeding raptors recorded included buzzard and sparrowhawk.

3.2.5.6.5 Moorland Breeding Bird Survey

The moorland breeding bird survey recorded a range of passerines and ground nesting waders typical of the open moorland and woodland habitats present within the study area.

A summary of breeding wader territories recorded within the study area is provided in Table 3.8 below.

Table 3.8: Breeding wader territories – Year 1.

Species	Min. No. Territories	Max No. Territories
Golden plover	2	4
Snipe	3	4
Greenshank	2	3
Common sandpiper	2	2

3.2.5.6.6 Breeding Raptor Searches

Breeding raptor searches recorded activity of the following species:

- Golden eagle – no occupied eyrie's were located within 6km of the project area however, activity suggests that the study area overlaps with at least one established or establishing territory.
- Sparrowhawk – at least a single territory is located within 2km of the project area.
- Buzzard – at least two territories were recorded within 2km of the project area.
- Red kite – no nest sites were confirmed within 2km of the project area, with activity recorded associated with known pairs beyond the study area.
- Osprey – no nest sites were recorded within 2km of the project area, a single known nest site (occupied in 2016) is located within 6km of the project area.

3.2.5.6.7 Breeding black grouse

A total of 10 lek sites were recorded within the study area, which supported a maximum total of 16 lekking males. Only two main lek sites were recorded, with the remainder comprising satellite lekking sites typically of single males.

One main lek site was recorded within the project area, which supported a maximum count of four lekking males over the course of the survey effort.

3.2.5.7 Potential Impacts

Potentially significant effects upon ornithological features are likely to arise from habitat loss, disturbance, mortality resulting from collision or interaction with development infrastructure, and cumulative effects with other developments.

These will be considered for the construction, operational and decommissioning phase.

3.2.5.7.1 Construction

During construction of the proposed development, in the absence of mitigation, it is anticipated that impacts upon ornithological features may arise from:

- Habitat loss, fragmentation or change as a result of the delivery and installation of development infrastructure; and,
- Disturbance to and loss of nest sites, eggs and/or dependent young.

There will be no direct impact on ornithological interests of any designated site for nature conservation and the potential for disturbance to golden eagle interests from the Glen Affric to Strathconon SPA is considered unlikely by virtue of spatial separation from the designation and very low levels of species activity recorded to date.

Construction activities are predicted to result in a temporary increase in noise, vibration and human presence within construction areas. This has the potential to displace birds from the vicinity of construction areas for the duration of construction works.

Effects would likely to be greatest during the breeding season (generally between March and August, depending upon the species), but are considerably variable between sites and species.

Overall construction disturbance would be considered temporary and would occur only when construction activities are taking place. Furthermore, construction would be not expected to take place over the whole project area, but within defined working areas, phased over small areas.

3.2.5.7.2 Operation

The operation of turbines and maintenance activities has the potential to cause disturbance and displacement of birds throughout the proposed development's operational lifetime. The extent of displacement is however, highly variable between species and species-group and therefore a species-specific assessment will take place on the basis of baseline studies.

The risk of avian mortality resulting from the collision of birds with the turbine blades (or additional wind farm infrastructure) is also acknowledged to be higher for some species due to their biometrics and flight behaviour. The likelihood of collision is also likely to be influenced by the nature habitats within the wind farm site and the surrounding environment.

Where flight activity data requires it Collision Risk Models following the Band Model in accordance with SNH guidance (Band *et al.*, 2007; SNH, 2000) will be undertaken to quantify the likelihood of mortality for target species and impacts upon designated sites.

3.2.5.7.3 Decommissioning

Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

3.2.5.8 Method of Assessment

Impact assessment presented within the EIA report will be undertaken in accordance with SNH guidance "*Assessing Significance of Impacts from Onshore Wind Farms*

Outwith Designated Areas“ (2018) and based on CIEEM guidance (2016) as detailed in Section 3.2.4.7.

The assessment process will include the following stages:

- determination and evaluation of important ornithological features;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects; and,
- identification of opportunities for ecological enhancement (CIEEM, 2016).

The approach to assessment will take account of existing guidance and published scientific literature in relation to birds and wind farm, together with professional judgement and experience of wind farm EIA.

The EIA report will provide a detailed description of the existing baseline ornithological features of the study area, along with the assessment of the potential impacts of the wind farm proposal on the identified important ornithological features. The assessment will conclude on the impact of the proposed development on the maintenance (or recovery) of species' favourable conservation status.

3.2.5.8.1 Important Ornithological Features

The identification of important ornithological features for detailed assessment will be undertaken on the basis of baseline study results with reference to SNH guidance (2018) and will broadly include:

- Qualifying features of Glen Affric to Strathconnon SPA;
- Species listed on Annex 1 of the Birds Directive; and,
- Species listed on Schedule 1 of the Wildlife and Countryside Act.

In addition, red-listed Birds of Conservation Concern (BoCC) (Eaton *et al.*, 2014), will also be identified where the conservation status of such species may reasonably be adversely affected by the proposed development.

3.2.5.8.2 Significant Effects

For the purposes of assessment, the significance of effects will primarily be expressed within the EIA report with reference to the regional, national or international scale (as relevant) in line with SNHs interests of bird species status at wider spatial levels. The significance of effects at a local scale may also be assessed where sufficient information allows a meaningful assessment.

The evaluations and effect assessments would be undertaken on the basis of the field survey information collated, augmented with information available from the desk study. Bird flight activity data will be collated and analysed to assess the potential risk to individual species of conservation concern from collision mortality, following the method described by Band *et al.* (2007).

In order to assess significance, population information will be collated on relevant regional and national scales where available and adopting a precautionary approach on the basis of uncertainty.

3.2.5.8.3 Cumulative Impacts

Cumulative impacts will be assessed with reference to SNH guidance (2012 and 2018) for all ornithological features subject to a detailed assessment. The potential for significant cumulative effects due to habitat loss, disturbance/displacement and collision risk mortality will be assessed. The assessment will be based on the consideration of residual effects i.e. assuming that proposed mitigation and compensation measures (where relevant) are implemented.

The cumulative assessment will include consideration of:

- existing wind farm developments, either built or under construction;
- approved wind farm developments, awaiting implementation; and,
- wind farm proposals awaiting determination within the planning process with design information in the public domain.

With regard to the spatial extent of the cumulative assessment, SNH guidance (2012 and 2018) stipulates that cumulative effects should typically be assessed at the relevant Regional NHZ scale, unless there is a reasonable alternative. The Kirkan Wind Farm Development is located within the Northern Highlands NHZ (Wilson *et al.*, 2015).

In this case undertaking an assessment of potential impacts at the regional NHZs would reasonably entail the consideration of a very large number of other wind farm developments. SNH guidance (2012) does recognise that access to relevant data for other developments may be limited and therefore a meaningful assessment of cumulative effects of such developments is not always possible. An alternative approach will therefore be adopted in this instance, whereby the core foraging range for each species included will be used to determine the spatial extent of the cumulative assessment, adopting a precautionary approach as necessary.

Core foraging ranges will be primarily taken from SNH guidance on “Assessing Connectivity with Special Protection Areas (SPAs)” (SNH, 2016).

3.2.5.8.4 Habitats Regulations Appraisal

On the basis of low levels of golden eagle activity recorded over the course of surveys, SNH have commented that a Habitats Regulations Appraisal (HRA) will be required in relation to the Glen Affric to Strathconnon SPA.

A standalone appendix to the EIA report will therefore be prepared containing relevant sufficient information to allow the competent authority to undertake a HRA of the proposed development in respect to this designation.

3.2.5.8.5 Consultation

Initial consultation with SNH and RSPB was undertaken prior to the commencement of baseline ornithological surveys to agree the scope of survey works proposed. Subsequent consultation with SNH was undertaken following the completion of year 1 surveys to agree the scope of survey works proposed for year 2.

Further consultation with SNH is proposed in relation to the assessment of effects upon breeding red-throated divers on the basis of existing data availability.

This will ensure that sufficient ornithological data is presented within the EIA report to all a robust assessment of effects to take place.

3.2.5.8.6 Matters Scoped Out

In consultation with SNH in September 2016, SNH commented that “We don’t consider there is any real connectivity between this site and the wood sandpiper and dotterel SPAs so no dedicated surveys needed”. As such, an assessment of potential effects upon these designated sites will not be undertaken.

3.2.5.9 Mitigation

The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features resulting from the proposed development will be part of an iterative design process.

Design consideration and measures to avoid and minimise impacts upon ornithological features at this stage will also include:

- **Black Grouse Buffers**

A minimum 500 m buffer between scheme infrastructure will be applied around identified main black grouse lek sites in so far as is possible.

Full details of the scheme design evolution and embedded mitigation measures in relation to ornithology will be detailed within the EIA report. This will include the specification of any species specific working buffers as necessary to ensure legislative compliance following the completion of baseline studies outlined.

Flight activity data will also be reviewed to identify any potentially problematic turbines likely to result in any significant collision risk mortality.

3.2.5.10 Enhancement

Suitable principles for biodiversity enhancement to be delivered as part of the proposed development will be outlined within the EIA report. The appropriateness and feasibility of principles will be confirmed with SNH and relevant consultees as necessary over the course of the EIA, with a view to prescriptive enhancement measures being detailed post-consent within a Habitat Management Plan (HMP).

3.2.5.11 Presentation of Sensitive Information

Sensitive data (e.g. breeding raptor and black grouse locations) will be included in a confidential appendix to the EIA Report which will not be made publicly available, but will be issued to SNH.

3.2.6 Hydrology

3.2.6.1 Introduction

An assessment of the potential effects on hydrology will be undertaken, primarily using a qualitative assessment based on professional judgement, statutory and general guidance and a range of legislation as set out below. The potential hydrogeological, geological and peat effects are outlined within Section 3.2.7 of this report.

3.2.6.2 Initial Consultation

Pre-application advice and consultation has been sought from the Highland Council, Scottish Environment Protection Agency, Scottish Natural Heritage and the Scottish Government Energy Consents Unit. Key issues raised are as follows:

- Drinking water supplies, including private water supplies, and any Scottish Water assets should be identified, investigated and any potential risks assessed. Highland Council has provided records of private water supplies that they hold for the relevant area but have emphasised that their data may be incomplete.
- Outline proposals for water quality analysis and monitoring should be included.
- Flood risk needs to be considered in order to demonstrate that the development is not at risk from flooding and will not increase flood risk elsewhere. The flood risk assessment should include assessment of watercourse crossings.
- A Drainage Impact Assessment is requested to address management of surface water drainage and runoff patterns.
- A schedule of mitigation should be provided, detailing pollution prevention measures that will be established during the lifespan of the project, through to site restoration.
- Some site activities are likely to require authorisation under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended. These include engineering works and a construction site licence for water management.

Mitigation measures relating to existing wind farms should not be compromised or negated by the development.

3.2.6.3 Preliminary Environmental Baseline

As mentioned previously, the proposed development area comprises open moorland with an area of young mixed plantation woodland located along the eastern fringe of the project area. The following sections provide an outline of hydrological baseline conditions.

3.2.6.3.1 Surface Water Bodies

Loch Glascarnoch

Lying adjacent to the A835 road to Ullapool, Loch Glascarnoch is a man-made reservoir which opened in 1957, forming part of the Conon Hydro-Electric Power Scheme. It has a substantial dam 28 m (92 feet) high and 510 m (1673 feet) in length⁷ and is located approximately ~720 m to the northwest of the proposed development area. Loch Glascarnoch was classified by SEPA in 2008 as having an overall status of 'Good ecological potential', with respect to aquatic chemistry and ecology⁸. A review of SEPA's

⁷ www.scottish-places [accessed February 2018].

⁸ SEPA RBMP Interactive Map (accessed 15/02/18). This web page shows the 2008 classification information reported to Europe in the Scotland RBMP (2009-2015).

'Indicative River & Coastal Flood Map' indicates that flooding from a 1-in-10 year event (classed as high risk) is restricted to the normal loch footprint. Flood risk from the loch is mitigated by the hydro-electric dam and resulting water control.

Glascarnoch River – Black Ridge to Loch Glascarnoch

Glascarnoch River runs parallel to the A835 northbound and is located ~22 m north of the proposed development boundary. Glascarnoch River was classified by SEPA in 2008 as having an overall status of 'bad ecological potential', with respect to aquatic chemistry and ecology⁹. There is an objective to improve this to Good by 2021. The main pressure on the Glascarnoch River is from the hydroelectric scheme which has resulted in a change in natural flow conditions. During construction activities best practices will be employed which will minimise the impact of the site works on this water course. A review of SEPA's 'Indicative River & Coastal Flood Map' indicates that flooding from a 1-in-10 year event is mainly restricted to the main river channel. .

Black Water – Garbat to Black Bridge

Black Water crosses the northern section of the proposed development area. Black Water was classified by SEPA in 2008 as having an overall status of 'moderate ecological potential' with respect to aquatic chemistry and ecology¹⁰. There is an objective to improve this to Good by 2021. A review of SEPA's 'Indicative River & Coastal Flood Map' indicates that flooding from a 1-in-10 year event is mainly restricted to the main channel.

Unclassified Surface Water Bodies

Several unclassified surface water bodies which are tributaries of the Black Water and Glascarnoch River are located within the proposed development area. These include the Allt Giubhais Beag which flows in a northerly direction along the western site boundary and the Allt Bad an t-Seabhaig which flows in a north-easterly direction along the eastern site boundary.

A review of SEPA's 'Indicative River & Coastal Flood Map' indicates flooding from a 1-in-10 year event is restricted to the main channels of Allt Bad an t-Seabhaig, Allt Giubhais Beag and the lower reaches of Allt Cearc an t-Slugain.

3.2.6.3.2 Private Water Supply

It is understood that a private water supply (PWS) serving the Aultguish Inn (75 m north-west of the site) is abstracted from the Allt Giubhais Beag which forms the site's westerly boundary. The abstraction point is associated with a dam feature located at approximate National Grid Reference NH348696. This will be further assessed as part of the site survey. In addition, The Highland Council's Environmental Health Department, SEPA and Scottish Water will be consulted as appropriate to identify any other potential PWS or water supply assets within the immediate vicinity of the site. No other PWS have been identified within the site boundary, but further consultation will help to identify other PWS that will potentially require assessment and safeguarding.

⁹ SEPA RBMP Interactive Map (accessed 15/02/18). This web page shows the 2008 classification information reported to Europe in the Scotland RBMP (2009-2015).

¹⁰ SEPA RBMP Interactive Map (accessed 15/02/18). This web page shows the 2008 classification information reported to Europe in the Scotland RBMP (2009-2015).

3.2.6.3.3 Site Conditions

The site mapping indicates that there are numerous watercourses within the site boundary, all of which form tributaries to the Glascarnoch River and Black Water. Hydrological constraints will be provided to the project design team to ensure that watercourses and waterbodies are protected through careful siting of infrastructure.

Initial habitat assessment indicates that much of the ground is boggy in nature and that site drainage will be an important consideration.

3.2.6.4 Potential Impacts

Potential impacts on surface water features, public and private water supplies and assets will be assessed with particular emphasis on effects on watercourses and tributaries of the Glascarnoch River and Black Water.

There is potential for the construction of the proposed development to result in impacts on water quality as a result of suspended sediment run-off and accidental spillages of on-site fuel sources. Impacts to surface water could include changes to the extent and form of hard surfaces and culverting or crossing of watercourses.

Normal operations are unlikely to have significant pollution risk impacts; however, the surface water runoff from the development and the drainage system design will need to be considered against current SEPA design criteria. This will include a review of the proposed drainage system with regard to climate change and sustainable drainage techniques.

A review of the potential changes to overland flow pathways will be undertaken looking at the existing situation and the phases of the development. This will be used to inform the constraints mapping for the turbine location planning that is further discussed in Section 3.2.7.

The potential hydrogeological, geological and peat impacts are outlined within Section 3.2.7 of this report.

3.2.6.5 Method of Assessment

A hydrological desk study will be undertaken to assess the existing hydrology, and to identify any potential effects caused by the proposed development during construction and operation. The hydrology will be considered, including a review of water quality and private water supplies.

Data will be collated from the following sources:

- Geological maps, both solid and drift geology;
- Hydrogeological maps;
- Groundwater vulnerability maps;
- Soil survey maps;
- SEPA water quality and discharge records for the project area;
- Functional Wetland Typology for Scotland;

- Local authority private water supply records;
- Any utilities and Scottish Water (SW) investigations being undertaken and details of water supplies;
- Previous assessments carried out in relation to the neighbouring wind farm projects; and
- Previous reports and studies of the project area obtained from Strathvaich Estate and past diversions of the Glascarnoch River, Black Water and their tributaries.

Consultations will be carried out with the following organisations and individuals:

- SEPA;
- The Scottish Government (Water Environment Unit, SEPA Sponsorship and Waste Unit and Energy Consents Unit);
- The Highland Council;
- Strathvaich Estate;
- Neighbouring landowners (if required); and
- Scottish Water.

Site visits will be carried out and comprehensive walkover surveys undertaken to confirm the major findings of the desk-based study and to identify any omissions. The field survey will establish ground conditions and nearest watercourses to each proposed turbine and access track. In the event that private water supplies are located within the catchment, these will be visited and the source mapped as far as practicable.

A constraints map will be produced presenting the results of the desk-based assessment and field survey, which will be used to inform the site design.

An assessment will be made of the potential direct, indirect and cumulative effects of the proposed development on hydrology. A hierarchy of mitigation strategies will be devised and will follow best practice guidelines including the Pollution Prevention Guidelines, the Water Framework Directive, the Water Environment (Controlled Activities) (Scotland) Regulations and relevant SEPA policies. Reference will also be made to the Flood Risk Management (Scotland) Act 2009.

A drainage impact assessment, including any proposed water management through sustainable drainage systems, will be undertaken. An assessment of all proposed watercourse crossings will be made.

3.2.7 Geology, Hydrogeology and Peat

3.2.7.1 Introduction

The geology, hydrogeology and peat assessment will involve a baseline study of the geology, hydrogeology, ground conditions and peat cover within the project area, followed by an environmental impact assessment for the proposed development. The assessment will be undertaken using published information from a range of sources, combined with site data gathered from peat depth surveys and a geotechnical site

walkover. The assessment will take into account current legislation as well as relevant statutory and general guidance.

3.2.7.2 *Initial Consultation*

Pre-application advice and consultation has been sought from the Highland Council, Scottish Environment Protection Agency, Scottish Natural Heritage and the Scottish Government Energy Consents Unit. Key issues raised are as follows:

- The site is known to contain peat. An assessment of the risk of natural or induced peat instability will be required.
- A plan for the management and reuse of excavated peat will be required.
- Groundwater dependent terrestrial ecosystems need to be identified and avoided where possible. An assessment of impacts would be required for any GWDTE that cannot be avoided.
- An assessment of the source of aggregate for site use is required. This should include options for sourcing aggregate from nearby quarries and reuse of borrow pits from the neighbouring wind farms as well as potentially sourcing aggregate on site.
- Any groundwater abstractions need to be identified and potential impacts assessed.

A schedule of mitigation should be provided, detailing pollution prevention measures that will be established during the lifespan of the project, through to site restoration.

3.2.7.3 *Preliminary Environmental Baseline*

3.2.7.3.1 Bedrock Geology

The project area is underlain by bedrock from the Moine Supergroup. The bedrock in the eastern section belongs to the Inchbae granitic gneiss, a coarse-grained and very distinctive metamorphosed granite. In the western section, the bedrock comprises a flaggy white psammite. Both rock types are likely to provide suitable material for wind farm aggregate. A small area of Ousdale Arkose, a much younger rock formation of Devonian age consisting of conglomerate and breccia, is located in the southern section of the project area.

3.2.7.3.2 Superficial Geology

Superficial deposits are dominated by peat and mixed glacial sediments. Peat cover is relatively extensive in the south-western section, with patches identified elsewhere¹¹. The northern and eastern parts of the project area are mainly covered with a blanket of glacial deposits consisting largely of mixed sandy clay diamicton. Some alluvial deposits are identified alongside the larger watercourses, notably the Glascarnoch River and some of its tributaries.

An initial peat survey across the project area indicates that peat and peaty soil are fairly widespread but are variable in thickness. Most of the peat and peaty soils are no more

¹¹BGS GeoIndex: <http://mapapps2.bgs.ac.uk/geoindex/home.html> [accessed February 2018.]
BGS maps portal: <http://www.bgs.ac.uk/data/maps/> [accessed February 2018.]

than 0.5 m in thickness although pockets of deeper peat are present, notably in the southern section of the area.

3.2.7.3.3 Soils

Soil cover is characterised by peaty gleys and peaty podzols, which cover the majority of the project area. A small area of mineral podzols is present in the southernmost section and an area identified as blanket peat is present in the south-eastern section¹².

3.2.7.3.4 Hydrogeology

The project area is underlain by bedrock classed as having very low productivity fracture flow. A small area in the south-western section is classed as low productivity fracture flow; this coincides with the area of Ousdale Arkose breccia and conglomerate.

The superficial deposits are largely classed as low productivity, although the alluvial deposits within the watercourse channels in the northern section are considered to be localised high-productivity deposits.

The groundwater vulnerability is considered to be Class 4, with small areas of Classes 3 and 5 present within the boundary. Vulnerability Class 4 is described as “Vulnerable to those pollutants not readily adsorbed or transformed” and indicates that the groundwater present within the project area has a relatively high level of vulnerability to individual events where potentially contaminating substances are involved.

3.2.7.3.5 Groundwater-Dependent Terrestrial Ecosystems

Groundwater-dependent terrestrial ecosystems (GWDTE) are areas of wetland or marshy ground that are reliant on groundwater to maintain their function as a wetland or marsh area. Some areas of potential GWDTE have been identified within the project area, based on the National Vegetation Classification.

3.2.7.3.6 Designated Sites

There is one designated site within 5 km of the project area that has been designated for geological reasons or for aspects associated with geology or peatland. In addition to its designation, the site is listed as a geological conservation review (GCR) site; this is not a statutory designation but identifies sites of national importance for geological features. A number of additional designated sites are present at distances greater than 5 km from the project area.

Details are provided in Table 3.9 below. Please note that the site of special scientific interest (SSSI), special area of conservation (SAC) and GCR boundaries are not identical, although the areas overlap.

Table 3.9: Distances to designated assets

Name	Designation	Approximate Distance and Direction	Qualifying Interest
Ben Wyvis	SAC; SSSI	4.3 km east	Quaternary of Scotland; blanket bog; acidic scree

¹² Scotland's Soils: http://map.environment.gov.scot/Soil_maps/?layer=1 [accessed February 2018.]

Name	Designation	Approximate Distance and Direction	Qualifying Interest
	GCR	4.9 km east	Quaternary of Scotland

3.2.7.4 Potential Impacts

Potential impacts on geology, groundwater, soils and peatland from all phases of the proposed development will be assessed. Particular emphasis will be given to potential impacts on peatland and on changes to groundwater quality or quantity with respect to GWDTEs.

Potential impacts that will be considered include:

- Rock extraction for aggregate, including sediment release and blasting;
- Changes to groundwater quality and flow paths;
- Changes to water supply to GWDTEs;
- Modifications to peatland including peat slide risk;
- Damage to soil and peat from traffic movements and from handling, transport and storage of excavated material;
- Soil and peat erosion.

Potential impacts from construction, operation and decommissioning phases will all be assessed. Some of the potential impacts listed above are anticipated to have only a minor effect during operation of the site. Cumulative and in-combination impacts with relation to nearby developments will also be considered.

3.2.7.5 Method of Assessment

The assessment will involve a desk study, to gather available data concerning the existing geological, hydrogeological and soil conditions in the project area. The following sources of information will be consulted within the desk study:

- Geological mapping, including bedrock and superficial;
- Hydrogeological mapping, including productivity and groundwater vulnerability;
- Soil mapping;
- High-resolution aerial or satellite imagery of the project area and its immediate surroundings;
- Borehole records, where available. These will be sourced from records held by the British Geological Survey (BGS) and other sources as available;
- Vegetation mapping and the Functional Wetland Typology of Scotland;
- Data gathered from site visits, including existing peat depth and vegetation surveys as well as any material arising from future site surveys that may be relevant.

Consultation will be held with the following organisations:

- Scottish Environment Protection Agency (SEPA);

- The Highland Council;
- Strathvaich Estate;
- Other stakeholders as identified during the assessment.

A constraints map will be produced to identify areas of higher sensitivity that should be avoided during the design process. This will include areas of deeper peat, sensitive wetlands, steeper slopes and other relevant constraints to development that are identified during the desk study.

Following the desk study and data gathering exercise, a site reconnaissance and walkover survey will be undertaken by a qualified engineering geologist. The reconnaissance and walkover will visit all areas identified as potentially at risk from the proposed development, such as GWDTEs and areas identified for aggregate extraction. Any sites indicated to have a higher potential risk of peat instability will also be visited.

Once a design is available, a peat probing survey will be undertaken to visit all the areas proposed for infrastructure. Data from the peat probing survey will be used, together with existing peat depth data, to inform a peat management plan (PMP) and peat slide risk assessment (PSRA).

The PMP will provide estimated volumes of peat to be excavated and options for reuse of peat within the proposed development area for reinstatement and restoration purposes, as well as providing outline methods for peat and soil handling and storage.

The PSRA will provide a formal assessment of the risk of natural or induced peat failure within the proposed development area during the project's lifespan. The PSRA will be undertaken in compliance with the Scottish Government's *Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments* (2017), and will make use of best practice guidance in the joint Scottish Government, SNH and SEPA document *Peatland Survey: Guidance on Developments in Peatland* (2017). Other relevant guidance will be used where appropriate.

Where relevant, mitigation and control measures will be put forward in order to manage or mitigate any potential impacts to sensitive receptors that may arise from the proposed development.

3.2.8 Noise and Vibration

3.2.8.1 Introduction

The EIA report will present an assessment of the potential noise effects of the construction, operation and decommission of the proposed development on the residents of nearby dwellings. The assessment of operational noise effects will account for the cumulative effect of the development as well as other wind farms nearby, in particular the Corriemoillie and Lochluichart wind farms, including the latter's consented and proposed extensions.

3.2.8.2 Initial Consultation(s)

The proposed baseline measurement locations will be selected in consultation with the Environmental Health Department of the Highland Council. The details of the

assessment methodology, in particular with regards to cumulative impacts, will also be discussed with the Council.

The Highland Council has highlighted that it generally requires wind farm schemes, both in isolation and cumulatively, to meet specific noise limits which are similar to those of ETSU-R-97 but with more stringent day-time and night-time lower noise limits (35 dB and 38 dB for day-time and night-time periods respectively).

3.2.8.3 *Baseline Environment*

The proposed development is located in an area of relatively low population density. The noise environment in the surrounding area is expected to be characterised in many cases by 'natural' sources, such as wind disturbed vegetation, water courses (in places), birds and farm animals. In addition, road traffic noise on the A835 will have an influence for some properties, although this will tend to reduce at night.

The baseline environment will be assessed by measuring background noise levels as a function of site wind speed at the nearest neighbours (or at a representative sample of the nearest neighbours), as required under ETSU-R-97 *The Assessment and Rating of Noise from Wind Farms* (ETSU 1996).

Consideration will also be given to referencing, where relevant, baseline measurements previously made as part of the application for neighbouring wind farms, such as the Corriemoillie and Lochluichart Wind Farms and extensions. However, these previous surveys may not be consistent with current good practice: specifically, the guidance set out in the Institute of Acoustics' Good Practice Guide (IOA, 2013) which will be referenced throughout the assessment of the proposed development.

For any new survey proposed, it will be necessary to consider the requirement for surveys not to be significantly influenced by the turbines on existing wind farms which is specified in ETSU-R-97.

The exact measurement locations and survey methodology are to be discussed and agreed in consultation with the Environmental Health Department of the Highland Council. It is likely that noise monitoring at a minimum of two properties will be proposed to provide appropriate representative data.

3.2.8.4 *Potential Impacts*

During construction and decommission, noise could arise from both on-site activities, such as: the construction of on-site access tracks, turbine foundations, the control building (substation) etc.; and also from the movement of construction related traffic both on-site and travelling on public roads to and from the project area.

Traffic volumes associated with operation of the proposed development are expected to be relatively low. Similarly, given the nature of works involved in the construction of a wind farm and distances to neighbouring dwellings, the risk of significant effects relating to ground borne vibration during construction is generally very low. These potential impacts will however be assessed as set out below.

During their operation, wind farms have the potential to create noise effects through both aerodynamic noise and mechanical noise. Aerodynamic noise would be caused by the interaction of the turbine blades with the air. Mechanically generated noise would be caused by the operation of internal components, such as, the gearbox and generator,

which are housed within the nacelle of the turbine. However, the level of mechanical noise radiated from current technology wind turbines is generally engineered to a low level.

The assessment of operational noise will also include the cumulative effects of other turbines in the area.

Noise contribution from energy storage equipment, such as fans as part of heating, ventilation and air conditioning (HVAC) systems will also be addressed, if relevant.

It is recognised that vibration resulting from the operation of wind farms is imperceptible at typical separation distances. It is therefore proposed to scope out the assessment of vibration produced during the operation of the proposed development.

3.2.8.5 Method of Assessment

3.2.8.5.1 Construction and Decommissioning

In assessing the impact of construction noise and vibration, it is usual to accept that the associated works are of a temporary nature. The assessment of potential impacts due to noise emissions during construction will be undertaken in accordance with the guidance in BS 5228 (British Standard Institute, 2009), which is consistent with the advice from the Highland Council. Predictions of construction noise will be made referencing typical activity emission levels and likely variations in noise levels at surrounding receiver locations, using the methodology set out in BS 5228 Part 1. This standard is referenced in Technical Advice Note to PAN 1/2011: Planning and Noise (Scottish Government, 2011). This standard can be used to predict noise levels associated with the different construction activities used throughout the construction programme. Part 2 of the BS 5228 standard considers construction vibration and this will also be referenced.

The assessment of construction noise and vibration will identify if and when predicted noise levels may be above standard guideline limits, taking into account the rural character of the area. The significance criteria of Table 3.10 will be referenced. They have been derived from the range of guidance values set out in BS 5228:2009 (Annex E), and other reference criteria provided by the World Health Organization (WHO) and PAN50 Annex A: The Control of Noise at Surface Mineral Workings (1996). Construction noise management procedures will also be determined.

Table 3.10: Free-field Noise Criteria against which Construction Noise Effects are Assessed

Significance	Condition
Substantial	Construction noise is greater than 72 dB $L_{Aeq,T}$ for any part of the construction works or exceeds 65 dB $L_{Aeq,T}$ for more than 4 weeks in any 12 month period
Moderate	Construction noise is less than or equal to 65 dB $L_{Aeq,T}$ throughout the construction period, with periods of up to 72 dB $L_{Aeq,T}$ lasting not more than 4 weeks in any 12 month period.

Slight	Construction noise is generally less than or equal to 60 dB $L_{Aeq,T}$, with periods of up to 65 dB $L_{Aeq,T}$ lasting not more than 4 weeks in any 12 month period
Negligible	Construction noise is generally less than or equal to 55 dB $L_{Aeq,T}$, with periods of up to 60 dB $L_{Aeq,T}$ lasting not more than 4 weeks in any 12 month period

Consideration will also be given to the potential impact of construction traffic on sensitive receptors in the area. Depending upon the outcome of the Traffic Assessment, the impact of traffic along the site access route will be assessed on the basis of the methodology within BS 5228-1:2009, as well as the Calculation of Road Traffic Noise publication (CRTN, Department of Transport, 1988), where appropriate.

For construction traffic, the criteria set out in the Design Manual for Roads and Bridges (DMRB, Highways Agency, 2011) will also be referenced. These suggest the following classification for different magnitudes of changes in the predicted traffic noise level calculated using the CRTN methodology: for short-term changes such as those associated with construction activities, changes of less than 1 dB(A) are considered negligible, 1 to 3 dB(A) is minor, 3 to 5 dB(A) moderate and changes of more than 5 dB(A) constitute a major impact. This classification will be considered in addition to the criteria of Table 3.10.

Cumulative construction noise effects are generally unlikely to be significant but will be assessed if there is a likelihood that the construction programmes and the location of the works (and/or access tracks) is likely to overlap significantly.

The assessment of the temporary effects of construction noise is primarily aimed at understanding the need for dedicated management measures and, if so, the types of measures that are required. In this respect, relevant working practices, traffic routes, and proposed working hours will be considered in the assessment.

3.2.8.5.2 Operation and cumulative impacts

The methodology for the assessment of operational noise from wind farms in Scotland recommended in planning guidance is that documented in ETSU-R-97. In summary, the assessment shall:

- Identify the nearest noise sensitive receptors;
- Determine the quiet day time and night time noise limits from the measured background noise levels at the nearest neighbours (see below);
- Specify the type and noise emission characteristics of the wind turbines proposed for the site;
- Calculate noise emission levels which would be due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours, including the cumulative effect of all turbines;
- Compare the calculated wind farm noise emission levels with the derived noise limits.

When considering neighbouring cumulative wind farm noise, the potential noise emissions from the adjacent wind farm sites will be considered by examining the potential level of noise emission allowed under the respective consent for each of the sites, in line with current best practice (IOA GPG).

The baseline environment will be assessed by measuring background noise levels as a function of site wind speed at a representative sample of the nearest neighbours. The good practice guidance in the IOA GPG will be taken into account, including advice on baseline survey, wind shear assessment and noise prediction methodology.

Mitigation of operational noise would be achieved through the design of the project, such that the relevant ETSU-R-97 noise limits can be achieved at the surrounding properties with commercially available wind turbines, taking into account the noise emissions from cumulative wind farms in the area.

The calculated wind farm noise emission levels will be compared with the noise limits derived in accordance with ETSU-R-97 and assessed in the light of relevant planning requirements. The specific guidance set out by the Highland Council in this regard, with more stringent day-time and night-time noise limits will also be considered.

The acceptable limits for wind turbine operational noise are clearly defined in the ETSU-R-97 document and these limits should not be breached. Consequently, the test applied to operational noise is whether or not the calculated wind farm noise emission levels at nearby noise sensitive properties lie below the noise limits derived in accordance with ETSU-R-97. Depending on the levels of background noise the satisfaction of the ETSU-R-97 derived limits can lead to a situation whereby, at some locations under some wind conditions and for a certain proportion of the time, the wind farm noise may be audible. However, noise levels at the properties in the vicinity of the proposed development will still be within levels considered acceptable in terms of the guidance commended by planning policy for the assessment of wind farm noise, and therefore considered not significant in EIA terms.

The noise limits derived according to ETSU-R-97 guidance, for each noise-sensitive receptor, apply to the total noise produced by all wind farms. Therefore, potential cumulative operational noise levels, including existing, consented and application wind turbines in the area, must be assessed relative to these limits.

3.2.9 Traffic and Transportation

3.2.9.1 Introduction

The proposed development has the potential to introduce impacts during construction, operation and decommissioning relating to traffic. These environmental effects of traffic will be assessed in accordance with the following principle sources:

- Institute of Environmental Management and Assessment (IEMA) (1993). Guidelines for the Environmental Assessment of Road Traffic;
- Highways Agency, (2011). Design Manual for Roads and Bridges (DMRB), Volume 11, Section 2 (Part 5, HA 205/08). Also published by: Transport Scotland, Transport Wales, The Department for Regional Development (Northern Ireland);
- Highland Council's Roads and Transport Guidelines for New Developments; and
- Transport Scotland (2012) Transport Assessment Guidance.

3.2.9.2 *Initial Consultation(s)*

Early consultation has been undertaken with stakeholders to identify any key issues with the proposals. The response from the Highland Council transport planning team highlights the need to prepare a stand-alone chapter covering transport issues, including any mitigation measures, road safety measures and traffic management. It was recommended that the assessment includes consideration of abnormal load and construction traffic routes, a construction traffic management plan (CTMP) and the impacts of the grid connection. The response from Transport Scotland confirms the need for the environmental impacts to be assessed, where appropriate, and for the impacts of both construction traffic and abnormal loads to be assessed.

Further consultation will be undertaken with Transport Scotland and the Highland Council's Roads Department to discuss the outline of the proposed development in terms of traffic and agree EIA methodology and the study area.

3.2.9.3 *Baseline Description*

The proposed development is located south of the A835, approximately 15 km north-east of the village of Garve in the Scottish Highlands. Access to the site is proposed from a new junction onto the A835.

It is anticipated that the largest volume of traffic will be associated with the construction phase of the project, when vehicles are likely to be travelling from major centres and ports to deliver materials to the project area. These origins are expected to be Inverness and Invergordon, which both contain ports, along with Dingwall and Alness.

The main construction traffic access routes are therefore likely to comprise the following:

- B817 (Invergordon), A9 (Alness), A835
- A862 (Dingwall), A862, A835
- A9 (Inverness), A835

These roads are predominantly A classified roads with an urban speed limit of 30mph and a rural speed limit of up to 60mph. The A9 and A835 both form part of the primary road network and are designed as long distance roads carrying a wide range of vehicle types, including goods vehicles.

The A862 and A834 through Dingwall is adequate to carry goods vehicles from the local area but is recommended that through traffic from Invergordon uses the A9 Cromarty Bridge as more suitable route.

It is considered that these roads represent a suitable study area for the assessment. Therefore, traffic data for these roads will be obtained from Transport Scotland to establish the baseline volumes, including proportions of goods vehicles, to inform the impact assessment.

3.2.9.4 *Potential Impacts*

The potential impacts of the proposed development would include the following:

- Temporary impacts on pedestrians and cyclists during the construction and decommissioning works, possibly requiring diversion of public footpaths, local or national trails and cycle routes, etc.

- Temporary impacts to local road users during the construction activities due to an increase in vehicle movements on the local road network and slow moving abnormal loads. Temporary road works and road closures may also be required increasing journey times.
- Permanent impacts to local road users during the operational phase due to an increase in vehicle movements on the local road network.

Indirect impacts (on noise, visual impacts on recreational walkers etc) are assessed elsewhere in the relevant chapters of the EIA Report.

3.2.9.5 Method of Assessment

An assessment of traffic and transport impacts, including a cumulative assessment, will be carried out to identify and assess the significant traffic effects anticipated to be associated with the proposed development and to inform further refinement of the proposed layout and design.

During the construction and decommissioning phases, construction traffic is likely to be generated by a range of activities including:

- Construction workers arriving and leaving site areas;
- Supply of construction materials and plant including turbine components;
- Movement of plant;
- Removal of soil resources, spoil or waste; and
- Service vehicles and visitors.

It is anticipated that the decommissioning phase will not generate traffic volumes greater than that experienced during the construction stage as it will predominantly reflect reversal of the construction activities.

Once construction of the proposed development is complete, the effect on the local road system will be minimal. There will be no permanent staffing needed at the proposed development, but access will be required from time to time for routine maintenance.

On the above basis, it is proposed to scope out the operational phase of the proposed development from the EIA Report and focus on the highest level of activity, which is represented by the construction (and thereby decommissioning) phase.

Where available, traffic data will be obtained from relevant highway authorities along key road links in the vicinity of and leading to the site access. These will be used to generate a daily profile of traffic using the local roads and provide a baseline scenario for assessment purposes.

The 'Guidelines for the Environmental Assessment of Road Traffic' suggest two broad rules can be used as a screening process to identify the appropriate extent of the assessment area. These are:

"Rule 1 - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and

Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more."

Where the predicted increase in traffic flow is lower than the thresholds, the guidelines suggest the significance of the effects can be stated to be low or insignificant and further detailed assessments are not warranted.

Where construction traffic flows do exceed these thresholds, the significance of traffic and transport effects (including cumulative) will be determined by assessing the sensitivity of receptors against the magnitude of change (as determined by the considerations outlined above) to categorise significance as Major, Moderate, Minor or Negligible.

'Significant' traffic and transport effects will be those effects identified as either of Major or Major/Moderate significance. These levels of effect are considered to be equivalent to significant effects referred to in the EIA Scotland Regulations 2011.

Where adverse traffic and transport effects are identified, mitigation will be proposed to reduce the effect of the proposed development. Given the requirements for transporting turbine equipment to the site from a preferred port, it is likely that mitigation will be identified at an early stage in the project.

Potential mitigation and monitoring options will be considered as part of the EIA. The degree and type required will be dependent on issues including the nature and characteristics of the environment and the proposed construction methodology. Mitigation will include the production of a Traffic Management Plan which would be developed as part of the proposed development. The plan will include traffic mitigation measures such as waste minimisation and management along with defining and managing construction traffic routes.

3.2.9.6 Cumulative Impact

The anticipated cumulative effects of the potential for overlapping construction programmes for the proposed development in addition to other proposed developments will be considered. The mechanism to mitigate any cumulative effects is the implementation of a TMP.

It is important to note that a cumulative assessment in respect of traffic, transport and access effects is dependent on the likelihood of more than one wind farm being under construction at the same time as the proposed development. This is especially pertinent to the peak construction periods associated with the importation of stone which would be dependent on the outputs of local quarries.

3.2.9.7 Issues to be Scoped Out

3.2.9.7.1 Operation

Once the proposed development is operational, there will be little traffic associated with the development apart from occasional maintenance vehicles which will have negligible effect. It is therefore proposed not to undertake any detailed assessment of the operational phase of the proposed development in respect of traffic, transport and access.

3.2.10 Aviation and Radar

3.2.10.1 Introduction

This section considers potential issues associated with aviation and radar as a result of the proposed development during the construction, operation and decommissioning stages.

3.2.10.2 Baseline Description

The Kirkan site lies outside of any Civil Aviation Authority (CAA) airport consultation zones, the nearest being Inverness airport at over 40km to the south-east. Initial line of sight analysis shows the project area to be fully screened from the airports radar by the intervening Little Wyvis hill, indicating that no impacts should be expected. An initial consultation with project information was submitted to the airports Operations Manager on 19th February 2018.

The site is not visible from any en-route primary or secondary surveillance radar, nor within the vicinity of any navigational aids or beacons, according to the National Air Traffic Service's (NATS) self-assessment maps. There are no upper airspace routes within 5 nautical miles (nm); the nearest lower airspace route (RIMOL to ULLAP) lies 3.3 nm to the north-east.

There are no Met Office radars within 80km.

The site is also not visible from any Ministry of Defence (MoD) operated radars, according to self-assessment maps. Along with the neighbouring Lochluichart and Corriemoillie schemes, as well as numerous other operational and consented schemes, the site does lie within the Highland Restricted Area 14T for low-flying interest, however MoD responses to previous consultation for the neighbouring schemes indicate that the area is not overly sensitive from this perspective.

3.2.10.3 Method of Assessment and Guidance

A pro-forma pre-planning consultation was submitted to the Defence Infrastructure Organisation ('DIO'), on behalf of the MOD, on 16th February 2018, the response to which will inform the approach to any assessments to be undertaken.

3.2.10.4 Key issues for consideration in the EIA

The EIA will take into consideration any construction or operational effects associated with MoD low flying, including the need for any aviation lighting in accordance with the neighbouring operational schemes.

3.2.11 Telecommunications

3.2.11.1 Telecommunications

3.2.11.1.1 Introduction

This section considers potential issues associated with telecommunication and television reception as a result of the proposed development during the construction, operation and decommissioning phases.

3.2.11.2 *Baseline Description*

Spectrum Licensing (Ofcom) have been formally consulted in December 2017, and relevant links operators in the area have been contacted.

The closest television transmitter for nearby properties is Rosemarkie, which has switched over to digital transmission only.

3.2.11.3 *Method of Assessment*

Any potential effects on communication links will be sought through consultation with relevant link operators.. An assessment will be undertaken to determine the significance of any potential operational effects and where appropriate, suitable mitigation measures will be discussed with the link operator.

3.2.11.3.1 *Television Reception*

Currently there is no widely accepted method of determining the potential effects of wind turbines on digital television, however digital television signals are better at coping with signal reflections and do not suffer from ghosting that may occur with analogue signals. It is therefore proposed to scope out any further assessment of effects on television reception.

3.2.12 **Miscellaneous**

3.2.12.1 *Forestry*

Introduction

This section details the way in which potential effects of the proposed development on the woodland/forestry areas within the project area will be assessed. It is not proposed to dedicate a specific assessment chapter within the ES report to deal with this aspect, however, it will be assessed where relevant in other technical chapters, primarily ecology, LVIA and hydrology.

Initial Consultation(s)

To date, no consultations have been undertaken.

Baseline Description

The project area predominantly comprises open moorland habitat, with an area of young mixed plantation woodland located along its eastern fringe. A Phase 1 habitat survey of the project area was completed in July 2017 (further details are provided within Section 3.2.4). The survey has provided a broad overview of the woodland habitat present within the project area, which comprises an immature plantation of Scots pine *Pinus sylvestris* and downy birch *Betula pubescens*, overlying blanket bog and wet heath habitats.

The woodland is currently managed by Strathvaich Estate for which a woodland planting scheme was granted for Strathvaich Farms on the site for a 256.4Ha area on 10th October 1990¹³.

Policy and Guidance

Relevant policy and guidance which will be considered during the EIA include:

National Policy

- Scottish Forestry Strategy, Scottish Executive 2006;
- Control of Woodland Removal, Forestry Commission Scotland, 2009; and
- Climate Change (Scotland) Act 2009.

Regional and Local Policy and Guidance

- Highland Forest and Woodland Strategy, Highland Council, 2006;
- Highland-Wide-Local Development Plan – Policies 51 and 52, The Highland Council, 2012;
- Trees, Woodlands and Development supplementary guidance, The Highland Council, 2013; and
- Guidance to Forestry Commission Scotland Staff on implementing the Scottish Government Policy on control of woodland removal, March 2015.

Method of Assessment

Any areas of anticipated loss of woodland cover as a result of the proposed development will be assessed within the EIA report but primarily within the relevant technical chapters. These will primarily relate to impacts upon habitat and related species, landscape character and visual amenity and hydrological regimes.

In addition to the assessment, the total area, age class and species composition of the woodland area will be further recorded to inform the assessment process as necessary.

Opportunities for compensatory planting and/or habitat improvement will be outlined in conjunction with the Ecology section of the EIA report. This will include consideration of potential effects upon other disciplines covered within the EIA report as a result of proposed planting.

Key issues for consideration in the EIA

Any woodland removal will be required to demonstrate compliance with the Scottish Government's policy on the control of woodland removal (FCS, 2012).

Where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration will be maintained through adherence to good forestry practice as defined in the UK Forestry Standard.

¹³ Information from Forestry Commission online map viewer:
http://maps.forestry.gov.uk/imf/imf.jsp?site=fcscotland_ext&

Any areas identified for potential compensatory planting elsewhere within the project area or across the wider Strathvaich Estate will be assessed for potential impacts by relevant topic specialists.

3.2.12.2 Carbon Balance Assessment

Introduction

A key benefit of wind energy (in common with other renewable energy technologies) is the generation of zero carbon electricity. This contrasts with the majority of electricity distributed on the UK's national grid which is generated by fossil fuels such as gas which give rise to significant emissions of greenhouse gases (GHGs). Operating wind farms deliver GHG savings by offsetting the consumption of fossil fuel generated mains electricity. During their construction and decommissioning, however, wind farms can themselves result in GHG emissions, for example from turbine manufacture and site preparation. This is particularly the case where natural carbon stores such as forestry or peat are present and potentially impacted by the development.

Peat surveys have established the presence of peat deposits within the project area. Where peat or carbon-rich soils are present, SEPA requires planning applications for onshore wind farms to include a systematic assessment of the likely effects to these features. This requirement accords with the EIA Directive (as amended) which sets out that direct and indirect effects of development projects on climate (Article 3) and climatic factors (Annex IV) are considered.

Potential Impacts

Anthropogenic climate change is predicted to result in severe, widespread, and irreversible impacts on people and the natural world unless GHG emissions are cut sharply and rapidly. Increasing atmospheric carbon dioxide (CO₂) is being absorbed by the oceans, increasing their acidification which damages coral reefs and marine life. Snow and ice cover is reducing across many areas of the planet and incidents of extreme weather are increasing, from flooding to tropical storms. The threat of species extinction is increasing from major changes to the global landscape, and pressure is also mounting on the availability of water and food resources as ecosystems change and global populations continue to increase.

Method of Assessment

A detailed desk-based assessment will be undertaken using the latest version of the Scottish Government's online Carbon Calculator Tool published in April 2017 (currently v1.4.0) to quantify GHG emissions and savings over the project lifecycle (construction, operation and decommissioning) and derive its net GHG effect and "carbon balance period", being the time following the start of wind farm operation at which point GHG emissions from construction and decommissioning activities are offset through GHG savings resulting from wind farm operation. The assessment will draw upon a range of detailed information regarding the project area and development proposals including:

- site characteristics (e.g. average temperature, wind speed etc);
- peat type and depth (from peat survey);
- water table depth before and after construction and decommissioning;

- development proposals (turbine number and output, access tracks, size of borrow pits, hardstanding and foundation areas etc);
- details of existing and new access tracks;
- forestry to be felled (types and areas); and
- post-decommissioning replanting / restoration / drainage proposals.

During the design process, the wind turbines will be sited to avoid the areas of deepest peat as far as practicable and measures to minimise disturbance to peat especially during excavation will be considered. To minimise peat disturbance during construction and decommissioning Best Practicable Measures will also be considered that will be provided as part of the Construction Environmental Management Plan.

The resulting Carbon Balance Assessment will be prepared in accordance with IEMA's guidance document *Assessing Greenhouse Gas Emissions and Evaluating their Significance in EIA* (2017), and presented in the relevant chapter of the EIA report.

3.3 Environmental Aspects Scoped Out

3.3.1 Air Quality

This section considers the scope of the required assessment of impacts that the proposed development might have on air quality.

The main source of impact on air quality would be increased traffic flows on local roads during construction and emissions from construction activities including exhaust fumes and dust generated from quarrying activities associated with borrow pits and unmade ground from borrow pits and access tracks in dry conditions.

It is considered that the air emissions associated with these activities will be transient, localised and highly unlikely to have a significant effect upon local air quality. In addition, there are well established best practice measures applied to construction that will form an integral part of the development process e.g. speed control, optimising deliveries to site, dust control, restrictions on idling plant/vehicles, etc. These controls and measures will form an integral part of the Environmental Management Plan for the development and will be detailed within the relevant parts of the EIA report.

There would be no emissions to air during operation, with the only source being occasional vehicles accessing the site for maintenance purposes. For the reasons cited above Air Quality is therefore scoped out from further assessment.

3.3.2 Population and Human Health

As per the 2017 EIA Regulations, an assessment of population and human health should be considered during the EIA process. It is proposed that this requirement will be covered through the findings of other assessments undertaken as part of the EIA process and so no dedicated EIA chapter will be produced.

Limited interactions with human health are possible, and consideration will be given to the findings of the following assessments in the EIA Report:

- Noise;
- Residential Amenity;

- Traffic and Transportation;
- Telecommunications;
- Aviation and Radar;
- Health and Safety at Work including best practice;
- Ice build-up on turbine blades and risk of ice throw;
- Lightning strike; and
- Risk of turbine failure and consideration of in built emergency procedures and best practice.

Properly designed and maintained wind turbines are a safe technology. The site design and inbuilt buffers from sensitive receptors will minimise any risk to human health resulting from the operation of the turbines.

As risks associated with ice build up and lightning strike are removed or reduced through inbuilt turbine mechanisms in modern machines it is proposed that this can be scoped out of the further assessment.

Effects on Traffic and Transportation; Noise; Residential Amenity will be assessed in full elsewhere within the EIA Report.

All other potential interactions with Human Health, building in Health and Safety best practice, and a sensitive approach to layout design, resulting from ice, lightning strike and structural failures are unlikely to occur and as a result potentially significant effects are not anticipated.

3.3.3 Vulnerability of the development to risks of major accidents and/or disasters (including climate change)

None of the following climate trends identified in UKCP0914 could affect the proposed development with the exception of increased windstorms:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (e.g. an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall); and
- Increased windstorms; and
- Sea level rise.

Braking mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced, then the turbines would be shut down. In addition, given the elevated location of the project area, flooding will not pose a significant risk to the operation of the wind farm nor will the construction of the proposed development contribute to flooding elsewhere. Therefore, it is considered unlikely that significant effects will arise as a result of the proposed development, and this topic can be scoped out of the further assessment.

¹⁴ <http://ukclimateprojections.metoffice.gov.uk/>

3.3.4 Shadow Flicker

3.3.4.1 Introduction

This section considers shadow flicker, an effect caused by the rotation of the turbine blades when the sun is shining, which can create a flickering or strobe like effect. This can be a cause of annoyance at residences near wind developments.

3.3.4.2 Guidance

There are no formal guidelines currently available on what exposure would be acceptable in relation to shadow flicker. There is no standard for the assessment of shadow flicker. The Scottish Government's web based guide relating to onshore wind turbines (Scottish Government 2013) suggests that as a general rule shadow flicker should not pose problems beyond a distance of 10 rotor diameters from a wind turbine, which equates to 1420 m in this instance.

Section 2.43 (p20) of The Highland Council Interim Supplementary Guidance: Onshore Wind Energy (March, 2012) states, '*the Council will expect wind energy developments to be located at least a minimum distance equivalent to 10 times the blade diameter from any regularly occupied buildings not associated with the development*'.

Department of Environment and Climate Change (DECC) studies have shown that in northern latitudes shadows from wind turbines can only be cast 130 degrees either side of north relative to the turbine due to the orientation of the earth's axis and the positioning of the sun.

This equates to a region of 50 degrees either side of due south where a wind turbine will never cast a shadow and therefore properties within this region will experience no effects from shadow flicker.

3.3.4.3 Baseline Description

There are nine properties that fall within 10 rotor diameters of the project area. However, only one property (Lubfearn, owned by the Strathvaich Estate) lies close to 10 rotor diameters of the proposed turbines shown in Figure 2.

3.3.4.4 Method of Assessment

During the design process, buffer of 10 rotor diameters will be maintained between properties and proposed turbines forming part of the proposed development, thereby eliminating shadow flicker impacts on nearby receptors. It is proposed that the potential effects of full shadow flicker from the proposed development be scoped out of further assessment.

3.3.5 Socio-economic, Land-use and Tourism

The approach to addressing socio-economic impacts through the EIA process is typically to split them into those that are specifically economic, and those that have a social implication (which in themselves can also have secondary economic impacts).

In terms of specific economic impacts, it is the effects of employment and the associated secondary economic impacts such as supply chain multiplier effects, and spend on local services, that are the focus of the assessment. As with the majority of

wind farms, the proposed development would bring the potential for significant positive economic effects at a local level in relation to the temporary increase in employment opportunities during construction. However, this would reduce down to a modest and insignificant impact longer term during operation.

In terms of impacts with a social implication, including recreation and tourism interests, there is a catalogue of research and survey that has concluded that there is no evidence to suggest wind farms have a significantly adverse effect on tourism. The most recent of these was produced by independent consultancy Biggar Economics (2017), which analysed the impact of Scottish windfarms on tourism-related employment.

The most comprehensive study of the potential effects of windfarms on tourism was undertaken by the Moffat Centre at Glasgow Caledonian University (2008). The study found that, although there may be minor effects on tourism providers and a small number of visitors may not visit Scotland in the future, the overall effect on tourism expenditure and employment would be very limited. This study is now almost 10 years old and in that time windfarms have become a more common feature in Scotland. A subsequent study by the James Hutton Institute (Dinnie 2012) concluded that there is no new evidence to contradict the earlier findings that wind farms have little or no adverse impact on tourism in Scotland.

More specifically relevant to Kirkan, whilst in a wider region of Scotland which attracts tourists and recreational users interested in outdoor pursuits, the project area and Strathvaich Estate are not notable tourist destinations in themselves. Nor are they areas notably used for specific recreation purposes, particularly given their lack of facilities. In terms of the wider area around the site, there are a number of interests with the Ben Wyvis National Nature Reserve and Munro (hill walking), Loch Glascarnoch (fishing), the Fannichs (hill walking), and deer stalking on various estates being the most notable of the recreational and tourist attractions. There are also a small number of properties affording accommodation in the wider area. Whilst impacts are likely upon these resources to varying degrees, we do not anticipate any of these effects will be significant.

Considering likely transport effects of the proposed development, whilst there may be some limited impacts resulting from construction works short term, significant effects upon tourism and recreation are considered unlikely over the lifetime of the wind farm. To that end, it is not anticipated that the proposed development would have a significant effect on such resources.

For this reason, it is not proposed that socio-economic impacts will be assessed as part of the EIA. However, it should be noted that as far as is relevant to other environmental aspects such as visual amenity and cultural heritage, tourist and recreational receptors will be fully assessed in the EIA report as detailed above.

Notwithstanding the scoping out of the assessment of socio-economic impacts from the EIA report, it is anticipated that information on such impacts, where potentially material to the decision making process, will be provided elsewhere within the Section 36 consent application.

4 CONSULTATION

4.1 Public Consultation

In accordance with established good practice, the applicant is currently planning to host a series of public consultation events, preceded by the circulation of a newsletter and the establishment of a dedicated project website with associated comments forms. The public events will take place as follows:

- Garve Village Hall, Garve. Tuesday 12th June 2018, 1.00 pm to 7.00 pm.
- Achnasheen Village Hall, Achnasheen. Wednesday 13th June 2018, 11.00 am to 4.00 pm.

Written public comments received in response to each of these methods will be documented and analysed, with any adjustments incorporated to the project design noted in the EIA report and SOCC.

4.2 Statutory and non-statutory consultees

As part of this scoping process the applicant's are inviting inputs from the consultation bodies and non-statutory consultees to inform the proposed development.

In addition to the receipt of this Scoping Report, consultees identified below will receive a separate formal consultation email from the Scottish Government's Energy Consents Unit. Responses to this should be sent to econsentsadmin@gov.scot by the deadline specified in the email.

Copied responses should be sent to:

Joe Somerville
Principal Consultant
RSK Environment Ltd
65 Sussex St
Glasgow
G41 1DX

Tel: 0141 418 0471

Email: jsomerville@rsk.co.uk

5 REFERENCES

5.1 Publications

Amec Foster Wheeler Environment and Infrastructure UK Limited (2015) Corriemoillie Wind Farm Discharge of Conditions. Condition 18, Ornithological Monitoring Protocol. On behalf of E.ON Climate & Renewables, January 2015

Biggar Economics (2017). Wind Farms and Tourism Trends in Scotland: A Research Report. Report published October 2017

British Standard Institute (2009). BS 5228:2009, Code of practice for noise and vibration control on construction and open sites. Part 1: Noise and Part 2: Vibration.

Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study*, 40, pp. 189-195.

Chanin P. (2003) Monitoring the Otter *Lutra lutra*. *Conserving Natura 2000 Rivers Monitoring Series No.10 English Nature*, Peterborough.

CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.

The Countryside Agency and Scottish Natural Heritage (2002). *Landscape Character Assessment*

Cresswell, W.J., Birks, J.D.S., Pacheco, M., Trehwella, W.J., Wells, D. and Wray, S., (2012) *UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation*. The Mammal Society, Southampton.

Daniels, M.J, Beaumont, M.A., Johnson, P.J., Balharry, D., MacDonald, D.W. and Barratt, E., (2001) Ecology and Genetics of Wild-living Cats in the North-east of Scotland and the Implications for the Conservation of the Wildcat. *Journal of Applied Ecology*, 38, 146–161.

Dean, M., Strachan, R., Gow, D. and Andrew, R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

Dinnie, E. (2012). *The Impact of Wind Farms on Scottish Tourism*. Report by the James Hutton Institute

ETSU (1996). *The Working Group on Noise from Wind Turbines, ETSU-R-97, the Assessment and Rating of Noise from Windfarms, Final Report for the Department of Trade & Industry*.

ETSU/DTI (2000) *A Guide to the Assessment of Cumulative Effect of Wind Farm Developments*

Department of Transport (1988). *Calculation of Road Traffic Noise (CRTN)*, HMSO.

Gilbert, G., Gibbons, D. & Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy

Gurnell, J., Lurz, P. and Pepper, H., (2009) *Practical Techniques for Surveying and Monitoring Squirrels*. Edinburgh: Forestry Commission Practice Note FCPN011.

Hardey, J., Crick, H., Wernham, C., Riley, H. & Thompson, D. (2009) Raptors: a field guide to survey and monitoring (2nd edn). The Stationery Office, Edinburgh.

Harris, S, Cresswell, P and Jeffries, D, (1989) Surveying Badgers (Volume 9, Occasional Publication). Mammal Society.

horner + Maclennan (2010). Assessment of Highland Special landscape Areas: Report to The Highland Council & Scottish Natural Heritage. Link: <https://www.highland.gov.uk/download/meetings/id/18894/item12speciallandscapeareascitations.pdf>.

The Highland Council (2016) Visualisation Standards for Wind Energy Developments.

Highways Agency, (2011). Design Manual for Roads and Bridges (DMRB), Volume 11. Also published by: Transport Scotland, Transport Wales, The Department for Regional Development (Northern Ireland).

Hundt, L. (2012) Bat Surveys Good Practice Guidelines, 2nd edition. Bat Conservation Trust.

IOA (2013). M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins (Institute of Acoustics). A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

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

IEMA (2017). Environmental Impact Assessment Guide to Assessing Greenhouse-Gas Emissions and Evaluating their Significance.

JNCC (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit: Revised Re-print. Joint Nature Conservation Committee, Peterborough.

Rodwell, J.S. (2006) National Vegetation Classification: Users' Handbook. Joint Nature Conservation Committee, Peterborough

Landscape Institute (2011) Advice Note 01/2011: Photography and Photomontage in Landscape and Visual Assessment

Landscape Institute (2017). Technical Guidance Note 02/17. Visual representation of development proposals.

Landscape Institute and Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment, 3rd ed. Abingdon: Routledge.

MacDonald, D.W., Daniels, M.J., Driscoll, C., Kitchener, A. and Yamaguchi, N. (2004). The Scottish Wildcat. Analyses for Conservation and an Action Plan. Oxford: WildCRU.

Moffat Centre (2008). The economic impact of wind farms on Scottish tourism - A report for the Scottish Government.

Scottish Environment Protection Agency (SEPA) (2014) Planning guidance on windfarm developments. Land Use Planning System Guidance Note 4. Version 7, May 2014. Scottish Environment Protection Agency.

SFCC (2007) Habitat Surveys Training Course Manual. Scottish Fisheries Co-ordination Centre.

Scottish Government (2011). Planning Advice Note (PAN) 1/2011, Planning and Noise, and associated Technical Advice Note.

Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments

Scottish Government, SEPA and SNH (2017) Peatland Survey: Guidance on Developments in Peatland (2017).

Scottish Natural Heritage (SNH) (2001). Guidelines on the Environmental Effects of Wind Farms and Small Hydroelectric Schemes;

SNH (2010). The special qualities of the National Scenic Areas. Scottish Natural Heritage Commissioned Report No.374. Link: <https://www.nature.scot/sites/default/files/2017-07/Publication%202010%20-%20SNH%20Commissioned%20Report%20374%20-%20The%20Special%20Qualities%20of%20the%20National%20Scenic%20Areas.pdf>

SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments. SNH, Inverness.

SNH (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH, Inverness.

SNH (2015) SNH general advice, sources of guidance and information for onshore wind farms. Scottish Natural Heritage, Inverness.

SNH (2016a) Assessing Connectivity with Special Protection Areas. SNH, Inverness.

SNH (2016b) Planning for development: What to consider and include in deer assessments and management at development sites. SNH, Inverness.

SNH (2017a) Scottish Natural Heritage consultation on draft guidance: Assessing impacts on Wild Land Areas - technical guidance;

SNH (2017b) Siting and Designing Wind farms in the Landscape Version 3

SNH (2017c) Visual Representation of Wind Farms – Guidance

SNH (2017d) SNH Protected Species Advice for Developments: Pine Marten. SNH, Inverness.

SNH (2017e) SNH Protected Species Advice for Developments: Wildcat. SNH, Inverness.

SNH (2017f) SNH Protected Species Advice for Developments: Badger. SNH, Inverness.

SNH (2017g) SNH Protected Species Advice for Developments: Otter. SNH, Inverness.

SNH (2017h) SNH Protected Species Advice for Developments: Water vole. SNH, Inverness.

SNH (2017i) SNH Protected Species Advice for Developments: Red squirrel. SNH, Inverness.

SNH (2018) Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas. Scottish Natural Heritage, Inverness.

Strachan, R, Moorhouse, T & Gelling, M. (2011). Water Vole Conservation Handbook 3rd edition. Wild CRU, Oxford.

VWT (2010). Organising and Conducting Pine Marten Scat Surveys. Herts: Vincent Wildlife Trust.

Transport Scotland (2012) Transport Assessment Guidance.

Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number 1504.

5.2 Websites

British Geological Society (BGS) GeoIndex:

<http://mapapps2.bgs.ac.uk/geoindex/home.html>

BGS maps portal:

<http://www.bgs.ac.uk/data/maps/>

Historic Environment Scotland designations:

<http://portal.historicenvironment.scot/designation/GDL00174>

SEPA RBMP Interactive Map:

<http://map.sepa.org.uk/floodmap/map.htm>

Scottish Natural Heritage Wild Land area descriptions:

<https://www.nature.scot/wild-land-area-descriptions>

Scotland's Soils:

http://map.environment.gov.scot/Soil_maps/?layer=1

Scottish Government online Carbon Calculator tool (published in April 2017) (v1.4.0)

<https://informatics.sepa.org.uk/CarbonCalculator/index.jsp>

UK Biodiversity Action Plan:

<http://www.gov.scot/Topics/Statistics/Browse/Environment/TrendBAP>

APPENDIX 1 – LIST OF CONSULTEES

List of Consultation Bodies

Energy Consents Unit

The Highland Council Planning Department as Local Planning Authority:

- Planning Department
- Environmental Health Officer
- Biodiversity
- Roads & Transportation
- Historic Environment Team

Scottish Environment Protection Agency (SEPA)

Scottish Natural Heritage (SNH)

Historic Environment Scotland

List of Non-Statutory Consultees

The Highland Council:

- Environmental Health Officer
- Biodiversity
- Roads & Transportation
- Historic Environment Team
- Access

Garve and District Community Councils

Sustrans Scotland

Transport Scotland

Arqiva

Neighbouring Community Councils

Joint Radio Company (JRC)

Forestry Commission Scotland

Spectrum Licensing (previously known as Ofcom)

Royal Society for the Protection of Birds (RSPB)

NG Wireless

Scottish Wildlife Trust (SWT)

Ofcom

British Trust for Ornithology (BTO)

BBC

West and North Ross Deer Management Group

BT

Atkins Global

Kyle of Sutherland Fisheries Trust

Civil Aviation Authority

Cromarty Firth Fisheries Trust

Ministry of Defence

Scottish Water

National Trust for Scotland

Visitscotland

Rambler's Association

Scotways

British Horse Society

Defence Infrastructure Organisation

National En-Route Traffic Ltd (NERL)

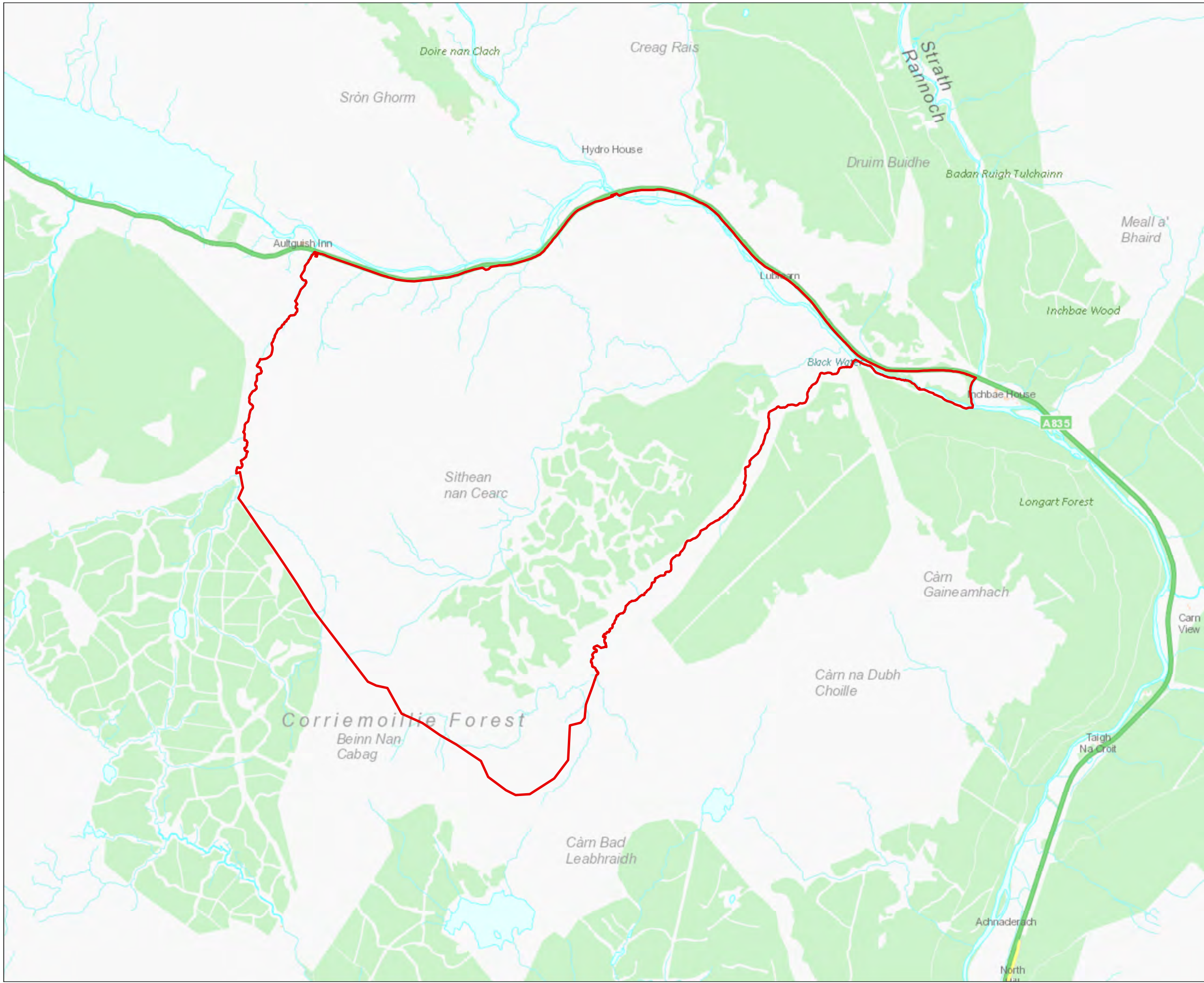
Highlands and Islands Airport

Health & Safety Executive

Highland and Islands Fire and Rescue Service

APPENDIX 2 – FIGURES AND PHOTOGRAPHS

Figure List



Legend:
 Site Boundary

Coordinate System: British National Grid
 Projection: Transverse Mercator
 Datum: OSGB 1936
 Units: Meter

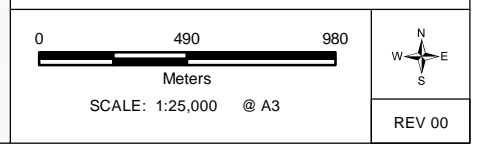


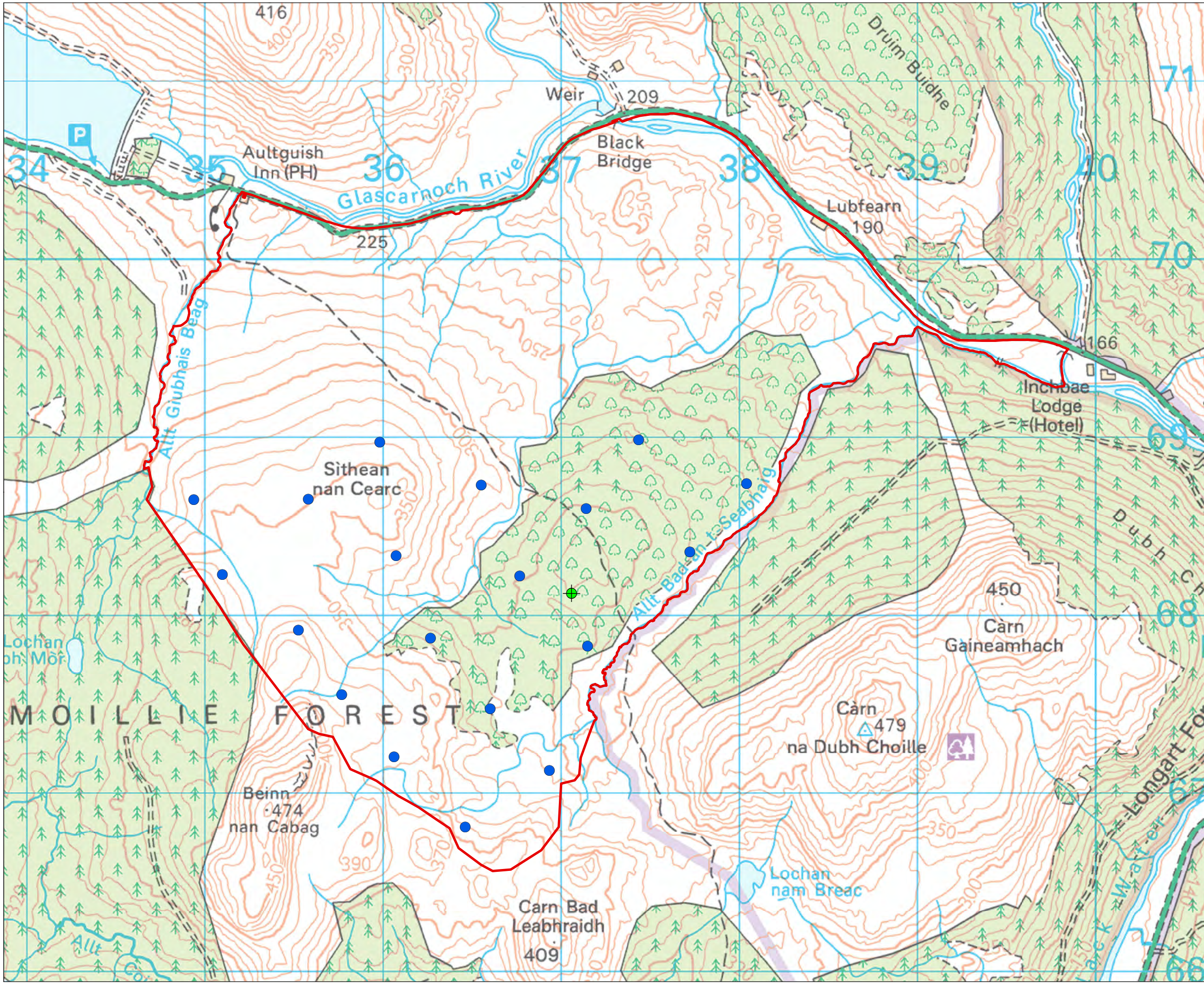
Rev	Date	Description	Drn	Chk	App
00	07/02/2018	First Draft	FC	JS	JS

Kirkan Wind Farm



TITLE:
 Figure 1 -
 Site Location Plan





- Legend:**
- Site Boundary
 - Indicative Turbine Location
 - ⊕ Temporary Met Mast

Coordinate System: British National Grid
 Projection: Transverse Mercator
 Datum: OSGB 1936
 Units: Meter



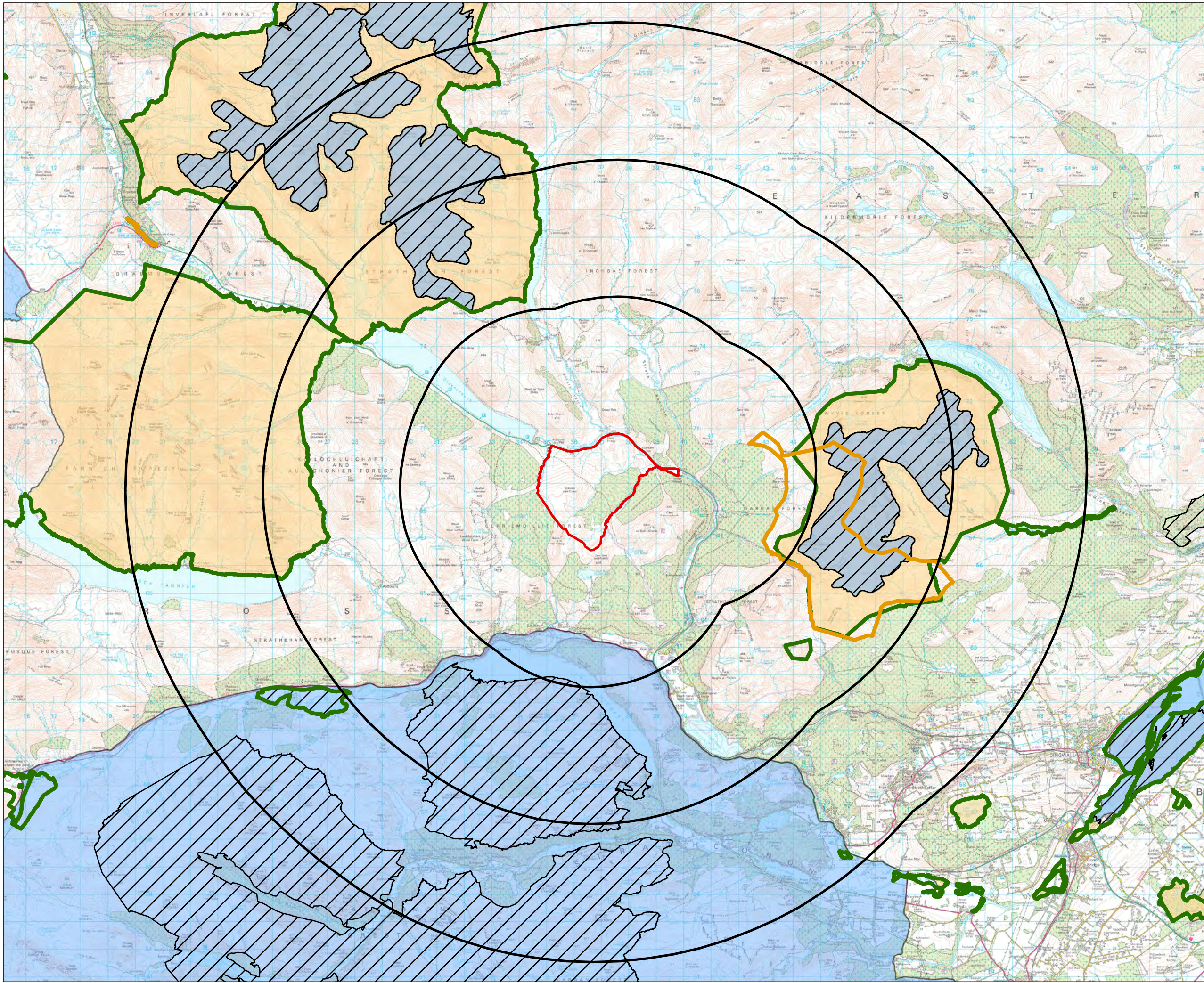
Rev	Date	Description	Drn	Chk	App
00	23/02/2018	First Draft	FC	JS	JS

Kirkan Wind Farm

TITLE: **Figure 2 - Site Layout Plan**

SCALE: 1:20,000 @ A3

N
W E
S



- Legend:**
- Site Boundary
 - 5km, 10km and 15km Study Areas
 - NNR
 - SSSI
 - SPA
 - SAC
 - Important Bird Area

Coordinate System: British National Grid
 Projection: Transverse Mercator
 Datum: OSGB 1936
 Units: Meter



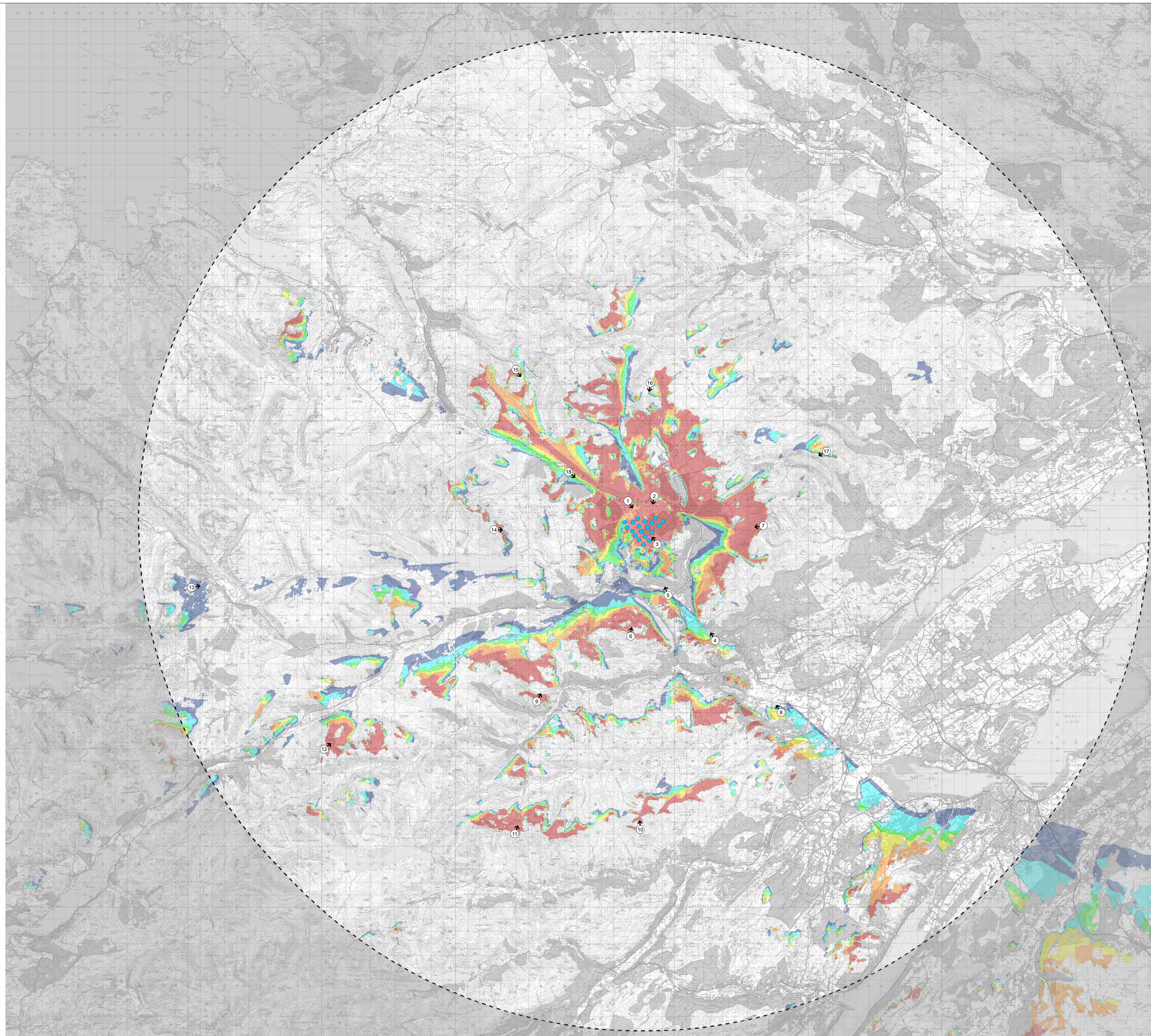
Rev	Date	Description	Drn	Chk	App
00	07/03/2018	First Draft	FC	JS	JS

Kirkan Wind Farm

TITLE: **Figure 3 - Environmental Designations Within 15km**

SCALE: 1:130,000 @ A3

REV 00



Legend:

- Preliminary Viewpoints
- Proposed Turbines (Preliminary Layout)
- 40 km radius Study Area
- Number of turbines visible at blade tip level (175m)**
- 1 to 4
- 5 to 7
- 8 to 10
- 11 to 13
- 14 to 16
- 17 to 19

Notes:
 This map contains data from the following sources:
 Coordinate System: British National Grid
 Projection: Transverse Mercator
 Datum: OSGB 1936
 Units: Meter



Rev	Date	Description	Dwn	Chk	App
02	06/03/2018	Second Draft	AC	RB	RB
01	26/02/2018	First Draft	AC	RB	RB

Kirkan Wind Farm

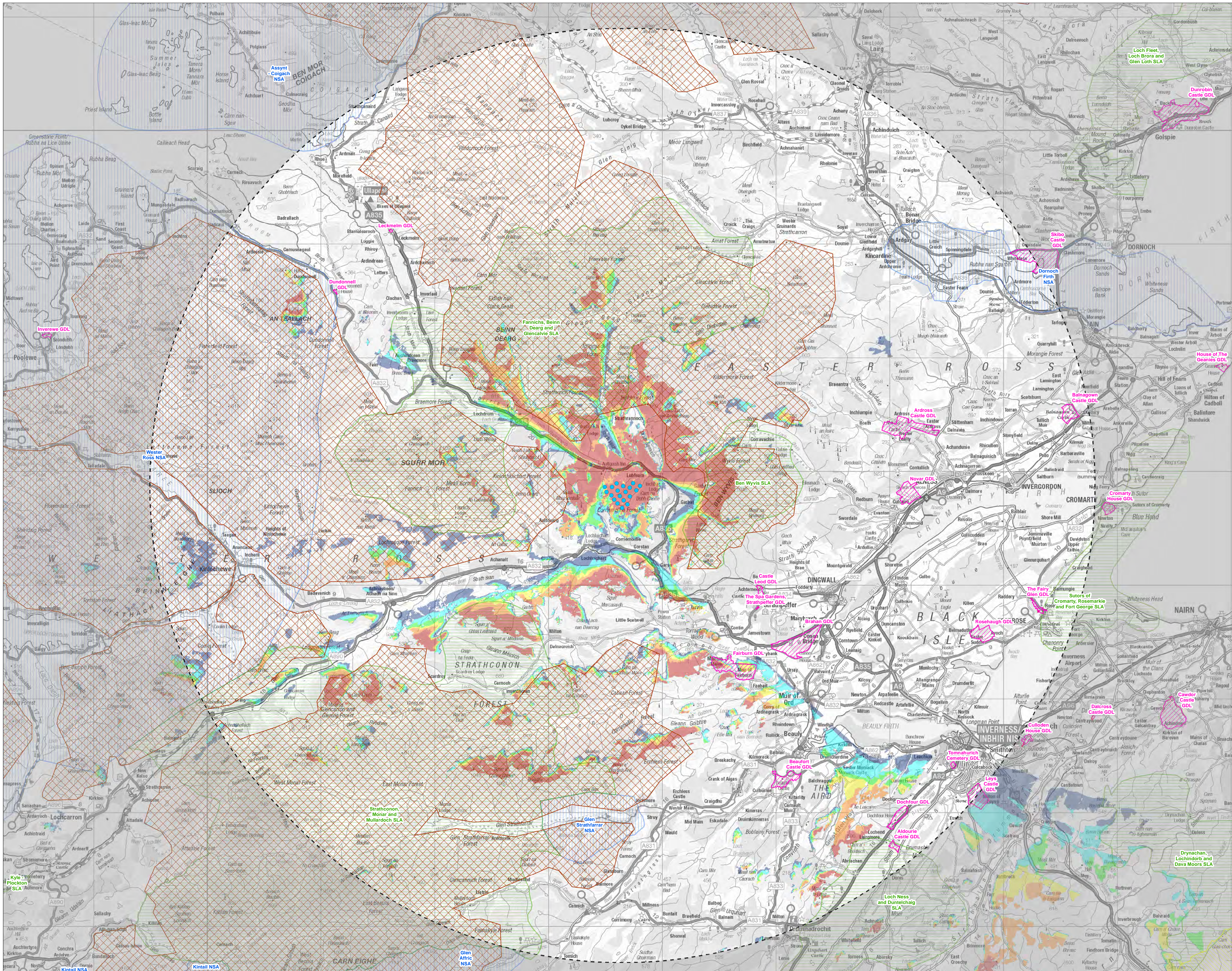
TITLE:
**Figure 4-
 Zone of Theoretical Visibility
 and Preliminary Viewpoint Locations**

0 4,500 9,000
Meters

N
W E
S

SCALE: 1:150,000 @ A1

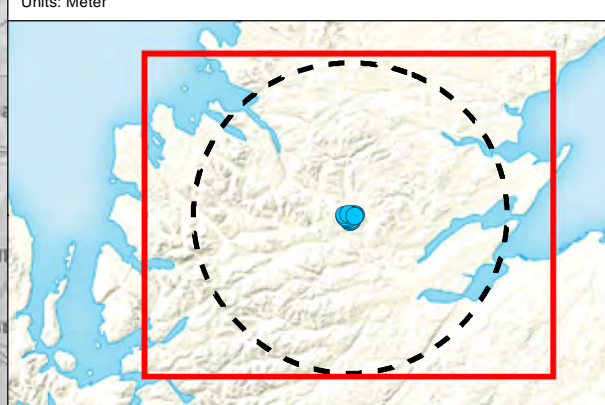
REV 00



Legend:

- Proposed Turbines (Preliminary Layout)
 - 40 km radius Study Area
 - Wild Land Areas 2014
 - Gardens and Designed Landscapes (GDL)
 - Cairngorm National Park
 - The Highland Council Special Landscape Area (SLA)
 - National Scenic Areas (NSA)
- Number of turbines visible at blade tip level (175m)**
- 1 to 4
 - 5 to 7
 - 8 to 10
 - 11 to 13
 - 14 to 16
 - 17 to 19

Notes:
This map contains data from the following sources:
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Dm	Chk	App
01	26/02/2018	First Draft	AC	RB	RB

Kirkan Wind Farm

Figure 5-
Landscape Designations,
Classifications, and ZTV

