Greystone Knowe Wind Farm Ltd

Greystone Knowe Wind Farm

Scoping Report

662711

MAY 2020

RSK GENERAL NOTES

Project No.: G/P/662711/05/01 Rev02

Title: Greystone Knowe Wind Farm: Scoping Report

Client: Greystone Knowe Wind Farm Ltd

Date: 15th May 2020

Office: Glasgow

Status: Rev02

Author	Adam Paterson	**Technical reviewer**	Joe Somerville
Date	14/05/2020	**Date**	15/05/2020
Project manager	Joe Somerville		
Date	15/05/2020		

CONTENTS

TABLES

FIGURES

See Appendix 2

APPENDICES

1 INTRODUCTION

1.1 Background

Greystone Knowe Wind Farm Ltd ("the applicant") is proposing to submit an application for consent for the Greystone Knowe Wind Farm (hereafter referred to as "the proposed development"), located 2 km south of Heriot and 2.5 km west of Fountainhall in the Scottish Borders. The proposed site within which the wind farm would be located currently comprises of upland grazing land and small blocks of plantation forestry.

At this early stage in the design process, it is anticipated that the site has the capacity to accommodate up to 15 turbines. The applicant has identified class I or class IIa turbines with a blade tip height of up to 180 m as the preferred choice. Each turbine is likely to generate between 4 and 5 Megawatts (MW) of electricity. The total installed capacity of the proposed development is therefore expected to be greater than 50 MW.

Greystone Knowe Wind farm is a joint venture between ESB and Coriolis Energy.

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 the development of 300 MW of wind farm projects in the UK. Since its inception, Coriolis has delivered 100 MW of operational onshore wind farms, with a further 400 MW in development.

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

While 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 (as amended).

1.3 The Scoping Process

Scoping is undertaken 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 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 and domestic levels. Such need is relevant in respect of responding to climate change, which is pertinent after Nicola Sturgeon declared a climate emergency on 28 April 2019, and of ensuring energy security. The renewable energy policy framework has evolved from a combination of European, UK and Scottish legislation and policies as shall be discussed below.

The Paris Agreement (2015) established a collaborative international effort to reduce greenhouse gas emissions globally. The EU member states, in response to the Paris Agreement, consented to a common Nationally Determined Contribution, which was legally binding, of a 40% reduction in greenhouse gas emissions by 2030, based on 1990 levels. In addition. the EU Energy Strategy (2015), which was ratified by all member states set a target that 27% of total energy need in 2030 should be met by renewable energy generation and this is enforced legally by EU directives. Although it is not clear yet what the future relationship between the UK and the EU will look like after 31 December 2020, both the UK and Scottish Governments have reaffirmed their commitment to the Paris Agreement and have legally binding targets that are more ambitious than EU legislation.

The UK Government produced the Clean Growth Strategy (2017), which outlined the policies that will guide the UK to meeting its climate change targets, as set out in the Climate Change Act (2008), whilst delivering sustainable economic growth. The strategy identifies the importance of nurturing low carbon technologies and facilitating the route to market for renewable energy.

Although control over the energy market remains a reserved matter, climate change policy, and promotion and consenting of renewable energy development are powers that are devolved to Scotland. Therefore, Scotland has its own set of key documents that form part of the renewable energy policy framework. The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a legally binding target of net-zero (the emissions account is 100% below the 1990 baseline) by 2045. The Scottish Climate Change Plan (CCP) (2018) and the Scottish Energy Strategy (2017) represent the strategical framework for Scotland's transition to a low-carbon economy. These documents set targets of 100% of electricity from renewable energy by 2020 and 50% of Scotland's energy need to be met by renewable energy in 2030. The continued growth of onshore wind is identified as a clear opportunity. The Onshore Wind Policy Statement (2017) sits alongside the Scottish Energy Strategy and provides specific guidance including encouragement for more onshore wind developments and the transition to larger wind turbines in landscapes that can support them.

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 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.

1.5.2 National Planning Policy and Guidance

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

- Scottish Planning Policy (Scottish Government, June 2014);
- The National Planning Framework 3 (Scottish Government, June 2014);
- Onshore Wind Turbines Specific Advice Sheet (Scottish Government, updated May 2014);
- Scottish Climate Change Plan (Scottish Government, 2018);
- Scottish Energy Strategy (Scottish Government, 2017);
- Scottish Onshore Wind Policy Statement (Scottish Government, 2017);
- Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments (Scottish Government, 2019);
- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011);
- PAN 2/2011 Planning and Archaeology (Scottish Government, July 2011);
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013);
- PAN 51: Planning, Environmental Protection and Regulation (Scottish Government, October 2006);
- PAN 60: Planning for Natural Heritage (Scottish Government, January 2008);
- PAN 69: Planning and Building Standards Advice on Flooding (Scottish Government, August 2004);
- PAN 75: Planning for Transport (Scottish Government, August 2005); and
- PAN 79: Water and Drainage (Scottish Government, September 2006).

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 of the Scottish Borders Local Development Plan (SBLDP) (adopted 2016) and the associated Renewable Energy Supplementary Guidance (2018) and the Wind Energy Landscape Capacity Study (2016). The key policy for consideration is ED9: Renewable Energy Development, but this will be cross-referenced with:

- PMD1: Sustainability;
- PMD2: Quality Standards;
- ED10: Protection of Prime Quality Agricultural Land and Carbon Rich Soils;
- HD3: Protection of Residential Amenity;
- EP1: International Nature Conservation Sites and Protected Species;

- EP2: National Nature Conservation Sites and Protected Species;
- EP3: Local Biodiversity;
- EP4: National Scenic Areas;
- EP5: Special landscape Areas;
- EP7: Listed Buildings;
- EP8: Archaeology;
- EP9: Conservation Areas;
- EP10: Gardens and Designed Landscapes;
- EP13: Trees, Woodlands and Hedgerows; and
- EP15: Development Affecting the Water Environment.

The Renewable Energy Supplementary Guidance (2018) and Wind Energy Landscape Capacity Study (2016) will be of particular relevance as they comprise the spatial framework that will be used in consideration of onshore wind developments and guidance on landscape and visual, and cumulative matters.

The Scottish Borders Council are currently in the process of creating the LDP2 which will be effective from 2021-2026. As this will cover the time period when the planning application for the proposed development will be submitted then the progress of the LDP2 will have to be monitored. The proposed LDP2 is expected to be published a year before the final version is adopted, therefore, it should be available during the EIA process and will inform understanding of whether the planning policy framework is likely to evolve prior to submission.

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 1.1 (see Appendix 2) shows the location and boundary of the area under consideration (referred to as the project area). Proposed turbine locations are identified in Figure 1.2. It should be noted however, that beyond scoping, the design of the development 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 land approximately 2 km south of Heriot and 2.5 km west of Fountainhall in the Scottish Borders. The current land use can be split into three categories: the fields in the south east of the site are used for sheep grazing, cattle raising, deer breeding and small areas are used for growing fodder; the remaining open fields, comprising the majority of the site are upland moorland used for sheep pasture; and, there are small areas of plantation forestry that also exhibit signs of supporting pheasant breeding. The proposed development site falls within the Scottish Borders Council area, in the Galashiels and District ward.

There are a few residential receptors in the vicinity of the site. Howliston is derelict, and owned by Pirntaton Farm. Brockhouse and Haltree farms are located to the east of the site.

The site location is shown in Figure 1.1 (see Appendix 2)

2.3 Project Components

2.3.1 Summary of Key Components

The Greystone Knowe Wind Farm development infrastructure would likely include:

- wind turbines and associated infrastructure;
- transformers and underground cables;
- internal and private access road network;
- onsite sub-station/control building;
- permanent anemometry masts;
- site entrance and access track from the Old Stage Road;
- temporary construction compounds;
- borrow pits; and
- energy storage equipment.

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

- number of turbines: up to 15 (to be confirmed through EIA);

- height to blade tip: up to 180 m;
- rotor diameters: approx. 150 m;
- individual turbine generating capacity: likely to be between 4 and 5 MW; and
- total generating capacity: anticipated 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 15 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 would depend on the type of turbine procured, and the specific ground conditions at the location of each turbine.

2.3.3 Permanent Anemometer Masts

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

At this early stage it is anticipated that there would be one or two anemometer masts on site, although this would depend on the type of turbine that would be used, and the constraints identified during scoping and the iterative assessment.

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 likely 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 would be from Old Stage Road to the east of the site. A new turning circle and access road would be constructed to link Old Stage Road and the site. The access would 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 would be retained throughout the lifetime of the wind farm for use by maintenance vehicles. The width of the tracks would be approximately 6 m, although may be wider for short sections, such as passing places, laydown areas and sharp bends. The surface of the tracks would have a cross fall to drain run-off into ditches on the downhill side of the track where necessary, and lateral and cross drains would also be installed where required. Outlets would be suitably located with erosion protection as required. The access would be developed to meet the requirements of appropriate guidelines (such as visibility, construction materials, surface water drainage, gradient and safety of other road users).

2.3.5 Watercourse Crossings

The Water Environment (Miscellaneous) (Scotland) Regulations 2017 came into force from the 1 January 2018. 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 would 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 would 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 would be connected to the substation building, which would 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 would be housed. The connection of the substation to the wider grid network would fall under a separate consenting process and would 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 would be present on site. It is anticipated that this would most likely take the form of housed or containerised arrays of lithium batteries, although alternatives may be considered as the design evolves. The power and energy capacity of such storage would be subject to the final installed capacity of the wind farm element of the project.

2.3.7 Internal Cabling

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

2.3.8 Stone and Aggregate

The proposed development would 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 would 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 would also be considered.

2.3.9 Construction Compounds and Work Areas

During the construction period, one or more construction compounds would be required that would include laydown areas. The main construction site office and compound would likely 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 would 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. It is anticipated that temporary lay-down areas would be provided for parking and unloading delivery vehicles and 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 Greystone Knowe 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.

The applicant acknowledges that there is uncertainty regarding the evolving COVID-19 situation and the impact that it might have on this project. First and foremost, the applicant recognises that this is a public health issue and is committed to protecting the health and wellbeing of everyone involved. The applicant and its supply chain will regularly review their processes and make adjustments to reflect the latest advice from the UK and Scottish Governments. Whenever it is not possible to proceed with the normal approach then the applicant will consult with the relevant stakeholder or consenting authority to find a solution that all parties find agreeable. The applicant takes its commitments under statutory provisions very seriously and will aim to comply with standard practice and guidance where practicable. The applicant would like to thank all stakeholders and the consenting authority for their understanding and flexibility in dealing with this serious matter.

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's preferred approach to community consultation would be to hold exhibitions and distribute circulars. Due to the evolving and uncertain situation regarding COVID-19, alternative methods of consultation are being discussed. The implications this might have for public consultation will be discussed in Section 4.1. In regards to consultation with other stakeholders and the consenting authorities the applicant will make every effort to accommodate the needs of the stakeholder and respect for the government advice. The most likely adjustment would be to replace face-to-face meetings with videoconferencing. The distribution of circulars would still be completed by the standard means, post and email. The situation is likely to evolve and a review of the community consultation approach will be held if and when it does.

The details around community consultation will be discussed with Scottish Borders Council and the ECU in due course. 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. There have been preliminary discussions held about how COVID-19 will impact field survey work. The primary focus is to identify control measures that will reduce the risk of COVID-19 to personnel completing field surveys to an appropriate level. Personnel that will be attending site for field surveys will be consulted to ensure that they are comfortable with the control measures and level of risk. The applicant would like to reiterate its commitment to protecting the health and safety of all people associated with the project.

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 (ER), 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 EIAR. The mechanism by which these measures would 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 Greystone Knowe 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 Landscape and Visual Impact Assessment (LVIA) will consider direct and indirect effects on landscape resources, landscape character, designated landscapes and wild land. It will examine the nature and extent of effects on existing views and visual amenity. The effects of the proposed development, and the ancillary infrastructure (access track, masts, transformers etc.) will be assessed during the construction, operational and decommissioning phases of the proposed development. The LVIA will also consider cumulative effects i.e. the incremental effects of the proposed development in combination with other renewable energy developments.

The LVIA will inform modifications and refinements to the layout design and will be undertaken following the approach set out in Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3). The assessment will also draw upon current good practice guidance issued by SNH.

3.2.2.2 Consultation

The content of this scoping report represents an initial consultation in respect of landscape and visual matters. Further consultation will be undertaken, as set out below, with relevant consultees in respect of other elements of the assessment as required information becomes available.

3.2.2.3 Preliminary Environmental Baseline

Site location and description

The proposed development is located approximately 2 km south of Heriot and 2.5 km west of Fountainhall in the Scottish Borders. The landscape is one of rolling hills and valleys largely covered by open fields and moorland. There are frequent shelterbelts and small blocks of forestry with occasional larger areas of commercial forestry, most notably along the Tweed Valley to the south.

Landscape character context

Local landscape character is described in the SNH Landscape Character Assessment in Scotland digital map-based character assessment (2019). The proposed development lies within Landscape Character Type (LCT) 90 Dissected Plateau Moorland.

This LCT is split into three units, of which the proposed development is located within the central one, encompassing expansive upland areas to the south of Edinburgh. It is broadly described as plateau landform of level topped hills and ridges, separated by steep sided valleys, with a strong topographic identity. There is a grandeur of scale with a sense of wildness created by wide horizons, open views and a very low settlement density.

Visual Amenity

As shown on Figure 1.1, the proposed development is located in a sparsely settled landscape to the south east of the Moorfoot Hills.

There are several main roads that run broadly north-south within 15 km of the site, including the A7 that passes within 2 km to the east and the A68 and A703 which are

further afield, 8.5 km to the east and 14 km to the west respectively. Aside from these main roads access is relatively limited in the vicinity of the site with a sparse rural road network comprising of B-roads and minor rural routes and few Core Paths.

The Southern Upland Way passes within approximately 12 km to the south east of the site at its closest point, just south of Lauder, while National Cycle Network (NCN) Route 1 passes around 3.5 km to the west as it follows the B709.

The nearest settlements are Heriot, (2 km north) and Fountainhall (2.5 km east). The nearest larger settlements include Gorebridge (11.5 km north-west), Lauder (12 km east) and Innerleithen (12.5 km south-west).

There are several other operational wind farms, occupying similar upland plateau locations, located within 15 km of the proposed development. These include Carcant (4.2 km north-west), Toddleburn (4.4 km north-east) and Longpark (8.9 km south-east).

Landscape designations

The site is not covered by any known international, national, regional or local landscape-related planning designations. However, landscape designations and other areas of varying landscape importance are present in the wider area (see Figure 2.1: Landscape Context).

Wild Land is considered separately.

3.2.2.4 Method of Assessment

Study area

An initial study area of 45 km from the outer turbines is proposed to assess the relationship between the proposed development and the wider area in terms of potential significant effects on landscape character and visual amenity. The initial study area would be determined once turbine height is known and will be in line with SNH Guidance 'Visual Representation of Wind Farms Version 2.2, (SNH, 2017). For the purpose of identifying, mapping and assessing the likely significant effects of the proposed development on the landscape of the site and its immediate surroundings, a 'detailed study area' from the outer turbines will be defined. This detailed study area will be informed through on-going assessment work but is likely to be between 15 km and 20 km.

Landscape Assessment

The landscape assessment will use the latest SNH online National Landscape Character Assessment (published in 2019) as the baseline for landscape character within the study area although will also draw on information within the Scottish Borders 2016 Update of Wind Energy Landscape Capacity and Cumulative Impact Study where it supplements the more recent SNH assessment.

Is this an acceptable baseline for assessment of landscape effects?

Visual Assessment

The assessment will be a receptor-based assessment. The assessment will include potential effects on settlement areas and routes, including roads, railway lines, walking and cycle routes, within the detailed study area, where potential visibility is indicated by the Zone of Theoretical Visibility (ZTV). The assessment will focus on those receptors

where there may be the potential for significant effects, which is likely to be those within 15 – 20 km of the proposed development.

Designated Landscapes

The assessment of effects on designated landscapes will be based on the potential impact on its special qualities. As illustrated on Figure 2.1: Landscape Context there are several nationally designated landscapes within the 45 km initial study area. There are two National Scenic Areas (NSAs), 28. Upper Tweeddale and 29. Eildon and Leaderfoot, located approximately 17 km and 19 km from the site respectively. The ZTV indicates that there would be very limited potential visibility within these areas, given the relative distance and limited potential for views of the proposed development it is proposed that effects on the NSAs are scoped out of the assessment.

The Edinburgh World Heritage Site (WHS) is located approximately 27 km to the north-west and the Forth Bridge WHS approximately 38 km to the north-west. Neither of these would have views of the proposed development, as illustrated by the ZTV, and effects on these areas will be scoped out of the assessment.

There are several Gardens and Designed Landscapes (GDLs) within the study area, as illustrated on Figure 2.1: Landscape Context; the closest of which is Arniston, approximately 11 km north-west. All of these areas tend to be set within surrounding valleys or lower lying areas where the ZTV indicates little to no visibility, they also tend to feature extensive tree cover which in practice would further reduce the potential for views. Given the lack of proximity and the limited potential for views of the proposed development it is proposed that effects on the GDLs are scoped out of the assessment. Effects on the cultural heritage value of these areas will be assessed separately in the relevant chapter of the EIAR.

Local landscape designations, including Scottish Borders Special Landscape Areas (SLAs) and similarly designated landscapes in surrounding authority areas, will be reviewed within the detailed study area and effects on these assessed where the ZTV indicates notable visibility of the turbines.

Is this an acceptable scope of assessment of designated areas?

Viewpoints

The list of viewpoint locations proposed to be used in the assessment of the proposed development are detailed in Table 2.1 below and illustrated on Figure 2.2: ZTV and Proposed Viewpoints (also Figure 2.3: ZTV and Proposed Viewpoints – Detailed). Some viewpoints, particularly those more distant hill summits may be illustrated with wireframes only. Viewpoints have not been 'ground truthed', so grid references are approximate and locations may be micro sited to obtain the most representative view or greatest extent of views.

Table 2.3.1: Proposed Viewpoints

VP	Location	Grid Reference	Distance/ Direction	Reason for Inclusion
1	Core Path 33, Heriot	339520, 653290	2.4 km N	Recreational users

VP	Location	Grid Reference	Distance/ Direction	Reason for Inclusion
2	Fountainhall	343232, 649057	3.0 km E	Settlement, road users
3	Heriot Way, Heriot	340285, 654520	3.4 km N	Settlement, road users
4	B7007 NW of site	334667, 652713	5.2 km NW	Road users, recreational users (NCN 1)
5	Windlestraw Law	337039, 643127	5.6 km S	Recreational users
6	Blackhope Scar	331526, 648339	7.2 km W	Recreational users, SLA
7	Stow	346016. 644478	7.2 km SE	Settlement
8	Core Path 22, SW of Oxton	347987, 651836	7.4 km E	Recreational users
9	Gorebridge	335194, 661538	11.7 km N	Settlement
10	A697 near Lauder	355381, 647267	15.3 km E	Road users
11	The Three Bretheren (Southern Upland Way)	343279, 631939	17.0 km S	Recreational users (long distance route), SLA
12	Eildon Mid Hill	354817, 632294	22.0 km SE	Recreational users, NSA
13	Twinlaw Cairns (Southern Upland Way)	362414, 654788	22.1 km E	Recreational users (long distance route), SLA
14	Scald Law	319164, 661085	22.8 km NW	Recreational users, SLA
15	Arthur's Seat	327533, 672941	25.4 km N	Recreational users, GDL

Several other potential viewpoints within the study area were considered in the initial review and subsequently excluded from consideration as follows:

Are the proposed viewpoints adequate?

Visualisations

The assessment will be supported by a series of photomontages and wireframes from agreed viewpoint locations. Visualisations from each viewpoint will be prepared in accordance with SNH, Visual Representation of Windfarms: Version 2.2, 2017.

Photomontages will be prepared for viewpoints within a 20 km radius. Ancillary elements will only be shown from close viewpoints where needed, as it is considered that from most viewpoints these ancillary elements would only form a minor element of the entire development.

Is the scope of visualisations adequate?

Wild Land Assessment

The closest Wild Land Area (WLA) to the site is WLA 02: Talla-Hart Fell, as illustrated by Figure 2.1: Landscape Context, which is over 30 km from the site. The ZTV indicates very limited potential visibility from the area, confined to a small number of hill summits. It is not anticipated that the key attributes or wildness qualities of the WLA would be notably affected and therefore no wild land assessment is proposed.

Is it acceptable for Wild Land Assessment to be scoped out of the EIA?

Night-time Assessment

This is an emerging area of assessment, but at present turbines of 150 m or greater tip height would require visible aviation lighting. A Lighting Strategy is currently being developed for the proposed development in conjunction with an aviation specialist. It is expected that the directional intensity/shielding of lights and a reduced intensity of lights (from 2000 cd to 200 cd) would be included as mitigation. In additional to this, there is emerging acceptance of cardinal or perimeter lighting schemes on suitable sites. If this is acceptable on this site, this would reduce the overall number of turbines which require lighting and would likely form the basis of the Lighting Strategy. Other forms of mitigation will also be investigated, such as radar activated lighting and siting/design considerations.

The agreed Lighting Strategy will form the basis of the assessment and visual material present. An assessment of night-time impacts on landscape and visual receptors will be carried out and presented as a separate appendix in the LVIA. Further consultation will be undertaken to establish the scope and visual material to support this assessment, when more is known regarding the mitigation which might be included in the Lighting Strategy.

Cumulative Assessment

In line with SNH guidance 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (SNH, 2012) the assessment will consider other wind farms within the LVIA study area including those which are operational, consented and those for which an application has been submitted but which are yet to be determined.

An initial cumulative search area of 45 km from the proposed development will be considered and all other wind farm developments identified. These will include all operational schemes, those schemes under construction, consented schemes, and those schemes in the planning system as valid applications (including schemes at appeal) within this search area. Recently withdrawn sites will not be included, and those sites registered with a Proposal of Application Notice (PAN), are not finalised applications and will therefore not be included as a valid application but will be included as a pre-application/scoping scheme. Turbines below 50 m and single turbine developments are only considered within a 5 km radius of the proposed development and are scoped out of the initial assessment and the CLVIA beyond this distance.

The scope of the cumulative assessment will be agreed with consultees nearer the time of the submission, usually within 12 weeks of submission. The proposed scope of the cumulative assessment will focus on where there may be likely significant effects which may influence the outcome of the consenting process.

Is search area and outline parameters for the cumulative assessment adequate?

Residential Visual Amenity Assessment

It is proposed that a separate assessment of the effects on residential visual amenity will be undertaken as a standalone appendix/document. This will be undertaken in line with Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA); for the purposes of the RVAA, we propose a 2 km study area from the outermost turbines.

Is the study area for the RVAA adequate?

Guidance

The LVIA will be prepared with reference to the following:

- Landscape Institute (LI) and the Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3).
- Landscape Institute (2019) Technical Guidance Note 2/19 Residential Visual Amenity Assessment.
- Landscape Institute (2019) Technical Guidance Note 6/19 Visual Representation of Development Proposals.
- Scottish Natural Heritage (2007, updated in 2014 and the Consultation Draft 2017) Assessing impacts on Wild Land Areas - Technical Guidance.
- Scottish Natural Heritage (2010) The special qualities of the National Scenic Areas, SNH Commissioned Report No. 374.
- Scottish Natural Heritage (2012) Assessing the Cumulative Impact of Onshore Wind turbine developments.
- Scottish Natural Heritage (2015) Spatial Planning for Onshore Wind Turbines – Natural Heritage Considerations.
- Scottish Natural Heritage (2017) Visual Representation of Wind Farms (Version 2.2).
- Scottish Natural Heritage (2017) Siting and Designing Wind Farms in the Landscape (Version 3).
- Scottish Natural Heritage (2019) Landscape Character Assessment in Scotland digital map based LCA.
- Natural England (2014) An Approach to Landscape Character Assessment.
- Natural England (2019) An Approach to Landscape Sensitivity Assessment.
- Forestry Commission (2017) The UK Forestry Standard.

3.2.3 Cultural Heritage and Archaeology

3.2.3.1 Introduction

The ‘cultural heritage’ of an area comprises archaeological sites, historic buildings, gardens and designed landscapes, historic battlefields and other sites, features or places in the landscape that have the capacity to provide information about past human activity,

or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest may also be informed by their 'setting' within the wider landscape.

Historic landscape is not treated as a heritage asset for the purposes of this assessment except where a defined area of landscape has been designated for its heritage interest (including Conservation Areas and areas included in the Inventory of Gardens and Designed Landscapes). It is recognised that all landscapes have an historic dimension, and this will be considered as part of the assessment of Landscape Character (covered in Section 3.2.2: Landscape Character and Visual Assessment).

It is important to note that, although any effects on the significance of heritage assets due to change in their setting are likely to be visual in nature, the assessment of these visual effects is distinct from the assessment of visual change in the LCVA. The assessment of effects on setting may be informed by visualisations prepared as part of the LCVA but the conclusions reached regarding visual change in the setting of a heritage asset are distinct.

The Cultural Heritage scoping report is intended to identify potential effects of the proposed development upon the physical fabric and settings of heritage assets within the site, and potential effects on the settings of assets within the wider landscape.

The Cultural Heritage section of the EIAR will characterise the historic environment within the site and in the wider study area. It will use the results of consultation, desk-based research, walkover surveys and setting visits to define a study area and to assemble a baseline of heritage assets within it, and then to assess the potential effects of the proposed development on that baseline. Where potential effects are identified, mitigation measures will be suggested.

3.2.3.2 Preliminary Environmental Baseline

The Baseline used for this scoping section has been compiled using existing data on the historic environment available online from Historic Environment Scotland (HES) via the Canmore database and the Pastmap website, and designations data available as GIS datasets from the HES website.

Two study areas have been used for the identification of heritage assets that may be affected by the proposed development:

The Inner Study Area (ISA) corresponds to the extent of the project area.

The Outer Study Area (OSA) extends to 20 km from the proposed turbines, which is taken as the maximum extent of potentially significant effects on the settings of heritage assets. Within the OSA, assets will be included in the assessment based on the level of importance assigned to the asset (defined in the EIA-R Methodology), to ensure that all significant effects are recognised:

- Up to 2 km from proposed turbines: Category C Listed Buildings, and any undesignated asset of local importance which has a wider landscape setting that contributes substantially to its cultural significance.
- Up to 5 km from proposed turbines: all assets of national or regional importance, including Scheduled Monuments, Category A and B Listed Buildings, Conservation Areas, Inventory Gardens and Designed

Landscapes, Inventory Historic Battlefields and undesignated assets of more than local importance.

- Up to 20 km from proposed turbines: any asset which is considered exceptionally important, and where long-distance views from or towards the asset are thought to be particularly sensitive, in the opinion of the assessor or consultees.

The Inner Study Area

There are no designated heritage assets recorded within the ISA (Figure 3.1). A study of the Pastmap website and the Canmore database has identified at least four undesignated heritage assets recorded within the ISA. These comprise two enclosures, a farmstead and some cultivation remains. None of the Canmore entries have been securely dated.

The baseline of the assessment will be informed by reference to designations data maintained by Historic Environment Scotland (HES) and to the Scottish Borders Council Historic Environment Record (HER). A digital extract will be obtained from the HER to ensure that the most up-to-date version of the data is used, and a walkover survey will be undertaken to confirm the presence of known features within the ISA once the layout has progressed and likely infrastructure locations have been identified.

The distribution of known archaeology in the surrounding area indicates that previously unidentified archaeological remains are more likely to be found at lower elevations and/or close to the principal watercourses. Areas of gentle gradient and/or below 400 m are considered of low to medium potential while areas of steep land, and areas above 400 m are considered of negligible potential.

The Outer Study Area

There are several designated heritage assets within 5 km of the project area (Figure 3.2). These include 11 Scheduled Monuments and 16 Listed Buildings. The Scheduled Monuments are all prehistoric and comprise seven forts, two enclosures and two settlement/house sites. The Listed Buildings comprise five Category B and 11 Category C Listed Buildings.

Within 20 km of the turbines, there are 261 Scheduled Monuments; 122 Category A Listed Buildings; 35 Conservation Areas; 24 Inventory Garden and Designed Landscapes (IGDL), and five Inventory Historic Battlefields.

There are no World Heritage Sites in the OSA.

The 261 Scheduled Monuments between 5 km and 20 km from the turbines comprise; 178 prehistoric forts, enclosures and/or settlements; 23 prehistoric ritual or funerary monuments; six Roman sites including military camps and roads; 20 medieval and post-medieval ecclesiastical sites, and 34 medieval and post-medieval secular structures and settlements. Six of the Scheduled Monuments are also Properties in Care of Scottish ministers (PiC).

The Listed Buildings comprise a mixture of country houses and estate buildings, monuments and memorials, churches, and urban domestic and commercial buildings. 132 of the Listed Buildings are within IGDLs and Conservation Areas and will be assessed as part of those assets. Six of the Category A Listed Buildings are within 10 km of the proposed development.

The majority of the Conservation Areas are north-west of the proposed development and comprise the burghs and towns of Midlothian and the remaining Conservation Areas are located along the River Tweed to the south. There are no Conservation Areas within 5 km of the proposed development.

The IGDLs comprise the estates and grounds of several castles, abbeys and estate houses. Of these, only Bowland (GDL66) is within 10 km of the proposed development.

3.2.3.3 Potential Impacts

Effects on the historic environment can arise through direct physical impacts, impacts on setting or indirect impacts:

- Direct physical impacts describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and would only occur within the application site.
- An impact on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (positively or negatively) the cultural significance of that asset. Visual impacts are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Impacts may be encountered at all stages in the life cycle of a development from construction to decommissioning but they are only likely to lead to significant effects during the prolonged operational life of the development.
- Indirect impacts describe secondary processes, triggered by the development, that lead to the degradation or preservation of heritage assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.

Cultural heritage constraint areas will, where necessary, be defined to include an appropriate buffer around known heritage assets. Constraint areas can be treated as a 'trigger' for the identification of potential direct impacts: they represent areas within which works may lead to direct impacts of more than negligible significance on known heritage assets.

Potential impacts on unknown heritage assets will be discussed in terms of the risk that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the development as a whole.

Potential impacts on the settings of heritage assets will be identified from an initial desk-based appraisal of data from HES and the HER and consideration of current maps and aerial images available on the internet. Where this initial appraisal identifies the potential for a significant effect, the asset will be visited to define baseline conditions and identify key viewpoints. Visualisations will be prepared to illustrate changes to key views, where potentially significant effects are identified.

Where potentially significant effects are identified, mitigation measures will be proposed. The preferred mitigation option is always to avoid or reduce impacts through design, or

through precautionary measures such as fencing off heritage assets during construction works. Impacts which cannot be eliminated in these ways would lead to residual effects.

Adverse effects may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation (SPP paragraph 150 and PAN2/2011, sections 25-27). Archaeological investigation can have a beneficial effect of increasing knowledge and understanding of an asset, thereby enhancing its archaeological and historical interest and offsetting adverse effects.

3.2.3.4 Method of Assessment

The assessment will be carried out with reference to the following policy and guidance:

- Planning Advice Note (PAN) 2/2011: Planning and Archaeology;
- Scottish Planning Policy (SPP) 2014;
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2014);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2014)
- Our Place in Time: The Historic Environment Strategy for Scotland (2015)
- Managing Change in the Historic Environment: Setting (Historic Environment Scotland (HES) 2016)
- Historic Environment Policy Scotland (HES, 2019);
- Historic Environment Scotland Circular (HES, 2019); and
- Designation Policy and Selection Guidance (HES 2019)

The consultees below will be approached for information to inform the EIA. These consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Scottish Borders Council;
- Historic Environment Scotland; and
- Local archaeological interest groups (as appropriate).

3.2.4 Ecology

3.2.4.1 Introduction

This section provides a summary of baseline (non-avian) ecological information gathered from desk and field surveys undertaken to date and further recommended surveys proposed to inform the EIA of the proposed development. An overview of the proposed methodology used to assess the effects of the development.

3.2.4.2 Initial Desk Study and Consultation

An initial desk study was undertaken in 2019 to inform the proposed scope of the ecological surveys and assessment. The desk study included:

- Review of statutory designated nature conservation sites in proximity to the proposed development[1]; and
- Data records search obtained from The Wildlife Information Centre[2]

To date no consultation has been undertaken with statutory or non-statutory nature conservation organisations. Further desk study and consultation is proposed (see Section 3.2.4.6).

3.2.4.3 Initial Field Surveys

Phase 1 Habitat Survey

A Phase I habitat survey was undertaken in August 2018 by Etive Ecology Ltd. and subsequently updated in May and September 2019 following guidance provided by the JNCC (2010).

A detailed Phase I habitat survey was carried out within the project area of the proposed development, mapping all habitats and collecting target notes to describe those habitats. The subsequent update in 2019 also included the proposed access route and a 100 m buffer of this. Areas outside the proposed development project area were not included in survey. Once an initial layout including tracks is produced, further survey may be required to ensure that appropriate buffers of infrastructure are surveyed for ground water dependent terrestrial ecosystems (GWDTE) to comply with SEPA guidance (2017).

National Vegetation Classification (NVC) Survey

An NVC survey was also carried out in August 2018 with an update in May and September 2019 including the proposed access route. The survey followed standard industry guidance (Rodwell, 2006).

NVC survey was conducted on all habitats within the proposed development project area. A representative sample of botanical quadrats were recorded in key communities such as all potential UK Biodiversity Action Plan 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).

Bat Surveys

An automated bat detector survey was completed within the project area between May and September 2019 by FDM Ecology Ltd following industry standard guidance (SNH, 2019).

A total of ten Anabat SD2 bat detectors were deployed at ten locations across the site for ten nights in each of May, July and September. Detectors were located close to proposed turbine locations provided in early layout designs.

[1] SNH Sitelink, available at www.sitelink.nature.scot/home

[2] www.wildlifeinformation.co.uk

Protected Species Surveys

Protected species surveys were conducted by Etive Ecology Ltd in May and September 2019. These surveys included:

- Otter survey on all watercourses within 250 m of the proposed development following relevant guidance in Chanin (2003).
- A water vole habitat suitability assessment carried out on all watercourses within the project area in May and September 2019 in line with guidance in the water vole mitigation handbook (Dean *et al.* 2016).
- Badger survey following the guidance set out in Harris *et al.* (1989) searching for evidence of badger including setts, latrines, tracks, prints and hairs within the project area and a 100 m buffer of this.
- Basic surveys for pine marten and red squirrel in suitable habitat within the project area. Searches for any evidence of both species were carried out. In the case of pine marten this included searches for scats and dens and in the case of red squirrel, searches for signs of feeding.

3.2.4.4 Preliminary Environmental Baseline

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

Designated Sites for Nature Conservation

There are no non-statutory (local) designated 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 4.1 and described in the bullet points below:

- **Moorfoot Hills Special Area of Conservation (SAC) and Site of Special Scientific Interest**: Borders the entire western boundary of the site and is designated for blanket bog, dry heath and upland habitat assemblages.
- **River Tweed SAC**: Located 1.25 km to the east (Gala Water) and 1.5 km to the north (Heriot Water) of the proposed development site. The main watercourses within the site flow into these two watercourses which are part of the Tweed SAC. The SAC is designated for several features including salmon and lamprey (river, brook and sea) populations, otter populations and localised areas of important riverine habitats (areas of floating vegetation often dominated by water crow-foot).
- **Fala Flow Special Protection Area, Ramsar site and SSSI**: 5 km to the north-east of the project area and designated for non-breeding populations of pink-footed goose.

Habitats and Vegetation

A Phase I habitat map of the study area is provided as **Figure 4.2**, and an NVC map of the study area is provided in **Figures 4.3a-c**. The proposed development site is dominated by grassland communities. In the east of the site, the low-lying ground is enclosed and grazed and dominated by both MG7 *Lolium perenne* leys and MG6 *Lolium perenne – Cynosurus cristatus* agricultural pastures. Westwards, the ground rises

towards the summits of Mount Main and Nethy Birchy Law. On these slopes the grassland becomes longer and less managed and areas of acid grassland including U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* and U5 *Nardus stricta – Galium saxatile* are present. Heavy grazing has occurred on these mid slopes and the majority of grassland is short growing and, in many places, U4 and U5 grasslands have given way to the more neutral MG6 pasture or intermediates between the two, leaving a short-growing, impoverished grassland. The survey carried out in 2019 noted that several large areas of grassland on the east side of Mumpot Law, the south side of Greystone Knowe and along Comely Rig had been recently cultivated for arable crops.

The grassy slopes across the site are separated by deeply incised burns including the Brockhouse Burn, Howliston Burn, and the Still Burn. The slopes of these burns tend to be vegetated with typical bracken and rush dominated communities (U20 *Pteridium aquilinum – Galium saxatile* community and M23 *Juncus effusus/articulatus – Galium palustre* rush pasture). For the most part these communities are species poor although an area of species rich M23a rush pasture was recorded on the mid to lower section of the Howliston Burn. The steep slopes leading down to this location were also vegetated with a typically diverse CG10 *Festuca ovina – Agrostis capillaris – Thymus polytrichus* grassland. This section of the site is considered to be the most botanically interesting part of the site despite obvious grazing influences.

In the west the site rises to the summits at Mount Main in the south-west and Nether Birchy Law in the north-west. At altitudes of between 400 m and 500 m the grassland habitats give way to upland bog and heath community. A hummocky M19 *Calluna vulgaris – Eriophorum vaginatum* bog community blankets much of the upper slopes of the site with a good quality heather sward. In places heavy grazing has occurred and heather is reduced leaving a hare's-tail cottongrass dominated M20 *Eriophorum vaginatum* blanket mire and in the vicinity of Nether Birchy Law the presence of drains has led to a dry, heathery bog community that is almost borderline dry heath.

On the well-drained slopes leading east from Mount Main and on the ridge between Nether Birchy Law and Greystone Knowe, H12 *Calluna vulgaris – Vaccinium myrtillus* heath and H9 *Calluna vulgaris – Deschampsia flexuosa* heath are recorded. These heaths are managed for grouse and have been burnt leaving the majority of the habitat species poor with only a little blaeberry, common sedge and purple moor-grass in addition to heather.

In summary, the project area is a heavily managed upland site supporting predominantly low-quality grassland and heathland which eventually gives way to good quality bog on the summits. Parts of the steep valley along the Howliston Burn have retained some botanical interest, in particular the species rich M23 rush pasture and calcareous grassland on the steep slopes are of interest and value. These habitats along with the extensive blanket bog on the summits represent the best habitats on site. The remaining habitats show signs of heavy grazing, burning and drainage which has reduced species diversity and affected habitat condition. With suitable land management the effects of these practices could be reduced or even reversed.

Protected and Notable Species

Survey findings for protected and notable species are provided in **Figure 4.4**.

Otter

Nine records of otter were found during the data search within 1 km of the project area, although none of these were from within the project area. During surveys there were no shelters identified within the project area or within a 250 m buffer of this however, spraint was recorded at Mount Main summit and at one location on the Brockhouse Burn suggesting that otter occasionally pass through proposed development site foraging or moving between catchments.

Water vole

No records of water vole within 1 km of the project area were returned by the data search. There is some potential habitat for the species on the margins of the survey area, but no evidence of the species was found and water vole are considered to be absent from the proposed development area.

Badger

A total of 17 records of badger were found during the data search within 1 km of the project area, although none of these were from within it. Several setts or potential setts were identified within the survey area. Only one of these setts is within the main wind farm site area.

Bats

A walk-over survey did not identify any potential bat roosts within the project area, although some trees in proximity to the proposed access route may have suitability for roosting. Static surveys of the site confirmed the presence of five species of bat within the project area. Three of these species are considered to be at high risk from wind turbines: common pipistrelle, soprano pipistrelle and noctule. The first two species are considered widespread and common species, although noctule is considered to be in the rarest group of bats in Scotland. Activity levels of soprano pipistrelle and common pipistrelle ranged from low to high. Noctule activity was mostly low although several nights recorded moderate activity.

Pine marten

No signs of pine marten were found during the surveys and no records of the species were returned during the data search. The site is considered to be sub-optimal for the species which are currently considered absent from the proposed development site.

Red squirrel

Two records of red squirrel within 1 km of the project area were returned from the data search. These limited records do not show evidence of activity within the project area, but they do indicate that the species is present in the area and could use woodlands within it. During the survey evidence of squirrel activity was found to be frequent in the coniferous plantation woodland at Dyker Law plantation and parkland which is on the route of the proposed development access.

3.2.4.5 Potential Impacts

Construction

The following potential effects as a result of the construction of the proposed wind farm development will be addressed in the EIA report:

- direct loss of habitat (potentially including Annex I habitats or BAP priority habitat) during the creation of turbine foundations, and hardstanding areas, access tracks, cabling, the substation/welfare building, the site compound and borrow pit(s);
- indirect impacts on habitats potentially including GWDTE and peatland habitats on site and offsite as a result of infrastructure on the site and changes to drainage patterns;
- indirect impacts on designated nature conservation sites including the adjacent terrestrial habitats of the Moorfoot Hills SAC and potential effects on watercourses affecting the River Tweed SAC[3];
- direct and indirect impacts on watercourses and aquatic species as a result of construction of any watercourse crossings, silt laden drainage and potential spillage of pollutants during the construction phase;
- harm including killing, injuring or disturbance of protected or notable species during site clearance, construction works or vehicular activity; and
- damage or disturbance of the breeding sites or resting places of protected or notable species during site clearance, construction works or vehicular activity.

Operation

The following potential operational effects as a result of the proposed development will be addressed in the EIA report:

- direct impact to bat species as a result of turbine collisions and indirect effects as a result of medium and long-term habitat change; and
- disturbance of protected or notable species and damage or disturbance of their shelters as a result of operational maintenance activities including increase human activity and traffic within the proposed development site.

Decommissioning

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

3.2.4.6 Method of Assessment

Baseline Studies

Habitat Survey

Phase I habitat and NVC survey work within the project area has now been completed and will be no older than 18 months at the time of submission of the EIA report. Once the first iteration of the layout including tracks has been completed, a 250 m buffer will be applied to turbines and borrow pits and 100 m buffer to tracks to ensure coverage of appropriate buffers for assessment of impacts on GWDTE as required by SEPA (2017). Additional Phase I and NVC surveys will be carried out in these buffers where survey has not been completed (i.e. if any of these areas fall outside the project area).

[3] Impacts on the Fala Flow SPA and Ramsar site will be addressed in the ornithology chapter of the EIA report.

Desk Study and Consultation

Further desk study and consultation will be undertaken to inform the EIA report. The following groups will be contacted for any records relating to the proposed development area:

- Scottish Badgers
- The Tweed Foundation
- The Tweed Fisheries Board

Protected Species Survey(s)

The majority of survey work has already been completed and will be no more than 18 months old at the time of submission of the EIA report. Based on the findings of those surveys, effects on water vole and pine marten can be scoped out of the impact assessment as both species are considered to be absent from the proposed development site. In addition, significant effects on species groups including invertebrates and reptiles can be avoided by implementation of suitable, standard mitigation and in line with guidance, these species do not require further survey to inform that mitigation.

Based on the survey work to date, further surveys may be required to inform the impact assessment on bats and red squirrel and the following surveys will be carried out in 2020 to inform the EIA report:

Bats

Automated monitoring using static detectors has been carried out within the proposed development area at ground level only. In September 2019 a met mast was erected on the project area, offering the opportunity to carry out at height monitoring of bat activity. Consultation will be carried out with SNH, including a discussion of survey results to date to determine if at height monitoring of bat activity is required between May and September 2020.

Red Squirrel

Evidence of squirrel (potentially red) feeding signs were found in the woodlands along the proposed access route. Once the felling corridor is known it is proposed that a dedicated search should be carried out for squirrel dreys to help inform the EIA. Limited feeding signs of red squirrel were found in shelter belts across the proposed development site, however, it is planned to design development infrastructure during the EIA process to avoid direct impacts to these woodland blocks , and therefore drey searches are not considered necessary in these areas. Surveys will be undertaken with reference to industry standard survey methodologies (Gurnell *et al,* 2009).

Assessment of Effects

The Ecological Impact Assessment will follow the current guidance provided by the Chartered Institute of Ecology and Environmental Management (2018) and will take into account the relevant pieces of legislation and regulations including but not limited to:

European

- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitat Directive)

National

- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (Habitat Regulations)
- The Conservation of Habitats and Species Regulations 2010 (the 'Habitat Regulations') which transposes Council Directive 92/43/EEC on the Conservation of Natural Habitat and of Wild Fauna and Flora ('the Habitats Directive') into law
- The Nature Conservation (Scotland) Act 2004 (as amended)
- The Wildlife and Countryside Act 1981 (as amended)
- The Wildlife and Natural Environment (Scotland) Act 2011
- The Protection of Badgers Act 1992 (as amended)
- Control of Woodland Removal Policy (2010)

The following guidance and strategy documents will also be used to inform and develop the impact assessment:

- UK Biodiversity Action Plan (UKBAP)
- Scottish Biodiversity List (SBL)
- Scottish Borders Local Biodiversity Action Plan (LBAP)
- Scottish Renewables (2019) Good Practice During Wind Farm Construction
- Scottish Natural Heritage (2012) Guidance Note: Assessing the cumulative impact of onshore wind energy developments
- SEPA Guidance Note 31 (LUPS) (2017) Guidance on assessing the impacts of development proposals on groundwater abstractions and groundwater dependent terrestrial ecosystems
- SNH *et al.* (2019) Bats and onshore wind turbines: survey, assessment and mitigation.

The assessment will be under pinned by the principles of avoidance, mitigation, compensation and enhancement. The assessment process will follow a staged process:

1. Identity the baseline ecology and determine the importance or 'value' of the ecological features that would be affected.
2. Assess the likely impacts and impact pathways and characterise the nature of those impacts.
3. Consider measures to avoid impacts or embedded mitigation measures to reduce the magnitude of impacts.
4. Assess the residual significance of impacts once specific mitigation has been applied.
5. If appropriate identify compensation measures to offset any significant residual impacts.
6. Identify any opportunities for the enhancement of biodiversity within the project.

Throughout all stages of the development design process options will be considered to firstly avoid impacts to ecological features where possible through alternative layouts, use of different timings or processes. Where this is not possible mitigation will be embedded in the scheme to minimise ecological impacts. Where avoidance or mitigation cannot completely avoid effects options for ecological compensation will be considered to offset any residual impacts. Lastly, opportunities for enhancement will be sought to provide net benefits for biodiversity as a result of the scheme.

Determining Nature Conservation Value

The first stage of the assessment of significant effects is to determine the nature conservation value of the ecological features within the project area. Each feature will be attributed a biodiversity value representing their significance. This value will be determined by several factors including but not limited to, the size of the species population or habitat type; whether that population or habitat type is stable or in decline; the condition or viability of the habitat or population; whether the habitats or species have a secondary or supporting value; or, whether the habitat or species are legally protected or included on action plans or within policies. Ecological features will be assigned one of the following levels of conservation value: very high/international importance; high/national importance; medium/regional importance; low/local importance; very low or negligible.

Identifying and Describing Impacts

Scheme details will be used to identify any impact pathways and the nature of these impacts will be described. The likely types of impacts are described in Section 3.2.4.5 of this report. For each ecological receptor the magnitude of the potential effect of the construction of the proposed development (and in the case of bats, operation) will be determined by considering the following factors:

- duration of effects: short, medium or long-term;
- extent and magnitude: consideration of the size and spatial area of the impact;
- timing and frequency: different receptors can have different levels of sensitivity at different times of year and the frequency of the disturbance can have an impact on magnitude;
- reversibility: consideration of whether the effects can be reversible in the short to medium term; and,
- confidence in the predictions: assess whether the effects are certain, probable, likely or unlikely.

The assessment will provide an approximate calculation (in hectares) of direct and indirect habitat loss for all habitat types affected by the development. Assessment of impacts on faunal species will consider species ecology and will take into account both short-term and long-term impacts and the potential for both direct and indirect impacts to species including habitat loss. Impacts will be assigned a magnitude rating based on the above assessment and will be assigned to one of five categories: high, medium, low, negligible or neutral.

Significance of Effects

CIEEM guidance defines a significant effect as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'. In broad-terms significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).

Significant effects should always be described at the relevant geographic scales. For something like a designated site which has been assigned a level of importance this might be simple, but for protected species, more careful consideration might be required. For example, otter might be protected at an international level, but the scale of impact of the proposed development may not affect the national population, it may be at a more local or district level of significance.

In the assessment a matrix system will be used as a guide to determine the level of significance. The matrix table will combine the level of value of the ecological feature along with the magnitude of effect to give a set level of significance. The matrix will only be used as a guide for assessing the significance of effects and professional judgement will be applied and explained where deviations from the matrix are necessary.

Residual Effects

The significance of effects will be determined on the basis of the scheme design with embedded standard/generic mitigation measures already in place. Where the assessment then determines a potentially significant effect, further mitigation and compensation measures will be considered and recommended. A second round of assessment will then take place to determine the significance of residual effects following the application of these measures.

Cumulative Impact Assessment

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or within a specific area. Due to the number of renewable schemes being constructed in the last decade this has become an increasingly important part of the EIA report.

The assessment will review relevant schemes (constructed, under-construction, approved or pre-approval where relevant planning documentation is available to review) with the same hydrological catchment or the regular mobile range of the species identified within the proposed development area. Emphasis will be placed on wind schemes and the assessment will consider cumulative residual impacts on both habitats and species for all relevant schemes.

3.2.4.7 Presentation of Sensitive Information

Ecological data considered to be sensitive, particularly that relating to records of badger and badger sett locations will be included in a confidential appendix to the EIA report. This will not be made publicly available but will be issued to SNH. Sufficient information will be provided in the EIA report to allow a robust assessment of potentially significant adverse impacts on ecological features.

3.2.5 Ornithology

3.2.5.1 Introduction

This chapter will consider the potential effects of the proposed development on ornithology. Particular attention has been paid to species of high or moderate ornithological importance, including species with international or national protection under the Wildlife and Countryside Act (1981) as amended and the EU Birds Directive (79/409/EEC).

3.2.5.2 Initial Desk Study

An initial desk study was completed for the site in November 2017. Records of raptors within 2 km of the site were obtained from the Scottish Raptor Study group. Records of black grouse were obtained from the Southern Upland Partnership covering the site and a buffer of 2 km.

3.2.5.3 Initial Consultation(s)

Initial consultation was undertaken with Scottish Natural Heritage (SNH) in August 2017. Preliminary results were presented along with proposed surveys and survey locations. Up-dated scoping was completed with SNH in January 2018 to agree the level of survey and justify the choice and accepted limitations of survey locations.

3.2.5.4 Field Surveys

The project area was subject to flight activity survey over two breeding seasons (2017 and 2018) and two winter seasons (2017/2018 and 2018/2019). Increased survey effort was made over one migration season (autumn 2017 and spring 2018).

Flight activity VP surveys

The project area was observed from four VP locations which were agreed upon with SNH during initial consultation in 2018. VP locations were selected to achieve maximum visibility of the potential collision risk zones. Due to topographical constraints this meant that two locations were selected within the site. One location (VP A) was located against plantation edge to enable effective survey of the central portion of the site. In addition to sitting against the plantation edge, surveyors wore cryptic coloured clothing to further limit disturbance impacts. VP C was located near to the second-highest point of the site. Here a compromise was made between two competing aims: a) to identify any birds passing between the site and the adjacent SSSI, and b) to cover as much of the site as possible, while acknowledging the lack of suitable higher elevations outside the site from which to look onto it, and landscape features of the site (including woodland blocks which interrupt the view and small valleys running west/east).

In total, 195 hours of survey was undertaken of the site between 31 March 2017 and 15 March 2019. This survey effort exceeded the minimum suggested by SNH of 144 hours[4]. Survey comprised 72 hours of breeding season survey, 72 hours of non-breeding season

[4] SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. Guidance Note Series

survey, 36 hours of migration survey and 15 hours of additional breeding season survey conducted in the first year to provide extra information on golden plover.

Migratory VP Surveys

Additional migration surveys were completed in autumn 2017 and spring 2018. A total of 72 hours of survey of the site was undertaken in these two periods.

A second year of additional migration survey was not considered necessary due to the very low level of migratory flight activity over the site. Through scoping with SNH in 2018 it was agreed that impacts on migratory waterfowl could be assessed from this level of survey.

Winter walkover surveys

Winter walkover surveys were not necessary because no wintering or migratory waterfowl were present on the site.

Moorland breeding bird survey

Breeding bird walkover surveys were completed in 2017 and again in 2018. Survey methods were an adapted Brown & Shepherd (1993) using four survey visits in both 2017 and 2018. The whole of the site was visited to within 100 m, and records of all species including moorland breeding waders, skuas, gulls, red grouse and wildfowl.

Breeding raptor searches

Breeding raptor surveys were conducted in the spring and summer of 2018. Survey techniques followed Hardey *et al* (2009). The local Raptor Study Group was contacted before survey to minimise potential disturbance to species if for example monitoring was already being undertaken.

Surveys for breeding raptors extended to 2 km beyond the project area where access could be gained. Where we were unable to gain access to the neighbouring land, a series of VP surveys were carried out to. VP locations were used within the project area to view these areas. Surveys concentrated on, but were not limited to, hen harrier, goshawk, merlin, peregrine and short-eared owl. Walkover surveys did not identify any suitable barn owl nest sites within 2 km of the project area.

Breeding black grouse surveys

The site and a buffer of up to 1.5 km were subject to dawn surveys in spring 2018. Where we were unable to gain access to the neighbouring land, the surveyors walked the edge of the site scanning and listening for calling birds (lekking male birds can be heard up to 1 km away on calm mornings).

Additional Surveys

15 hours of additional vantage point surveys of the site were undertaken in the spring and summer of 2017, over and above the 36 hours normally required for this survey element. This was to provide more information on the possibility that the site was used by golden plover breeding on the neighbouring SSSI.

3.2.5.5 *Preliminary Environmental Baseline*

Designated Sites for Nature Conservation

The development site is located 7 km to the south of Fala Flow RAMSAR, SPA, and SSSI and 8 km south-east of Gladhouse Reservoir SPA. These sites are designated for their wintering populations of international importance of pink-footed geese and other wildfowl. SNH describe[5] the core foraging range of wintering pink-footed geese to be 15-20 km. Therefore the Scottish Government will be required to carry out an appropriate assessment in view of the proximity of the site to these SPAs. However, the proposed wind farm site is not located between these SPAs and any of the foraging areas used by their pink-footed geese populations (Mitchell[6]). It is therefore unlikely to be used as a flight route by the species concerned. Indications from VP surveys are that the proposed wind farm would not have an adverse effect on the site integrity of the SPA.

The project area borders the Moorfoot Hills SSSI, which is designated for its breeding bird assemblage and breeding Golden Plover. The site is therefore within foraging distance of the qualifying bird species of this SSSI.

Protected and Notable Species Records

Records of flights by golden plover were recorded during the surveys. Golden plover were largely not recorded on the site during their main breeding season of between May and September (no records were made after 29 May 2017 and after 7 May 2018). Similar numbers of individual flight records were recorded in each non-breeding season (October 2017 to March 2018: 48 flights comprising a total of 1,524 individual flight records and October 2018 to March 2019: 39 flights comprising a total of 1,564 individual flight records). There was a significant drop in activity between March and May periods in 2017 (47 flights comprising a total of 2,739 individual flight records) and 2018 (11 flights comprising a total of 376 individual flight records).

Additionally, species of note included sightings of goshawk, hen harrier, red kite, merlin and peregrine, none of which were breeding on site. Breeding records of lapwing, curlew, redshank, snipe and oystercatcher were recorded from flight and walkover surveys.

Flight Activity Surveys

The following target species were recorded during vantage point surveys: black headed gull (247 flights); common gull (30 flights); curlew (375 flights) ; greater black-backed gull (6 flights); goshawk (21 flights); grey heron (1 flight); greylag goose (11 flights); golden plover (145 flights), herring gull (143 flights); hen harrier (3 flights); kestrel (82 flights); red kite (5 flights); lapwing (119 flights); lesser black-backed gull (104 flights); mallard (6 flights); merlin (9 flights); oystercatcher (38 flights); peregrine (5 flights); pink-footed goose (18 flights); redshank (2 flights); short-eared owl (41 flights); snipe (35 flights) and teal (1 flight).

During the breeding season, lapwing and curlew were occasionally observed displaying constantly during the vantage point survey, and to comply with the requirement to monitor

[5] Scottish Natural Heritage (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance Note.

[6] Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust/ Scottish Natural Heritage Report, Slimbridge.

the whole viewshed, these areas were marked on maps as constant activity by these species. Where flights of these species were observed to enter potential collision risk height then flights were recorded.

Moorland Breeding Bird Survey

Across the 2017 and 2018 survey periods, a total of 63 species were recorded in the project area during the moorland breeding bird walkover survey. The following target species were recorded in the project area. Not all species observed were considered to be breeding on the site.

Table 3.2: Summary of 2017 and 2018 bird surveys

Species	2017 (observed = Y, Breeding = B)	2018 (observed = Y, Breeding = B)
Black-headed gull	Y	Y
Curlew	Y/B	Y/B
Common gull		Y
Crossbill		Y/B
Greylag goose	Y	
Golden plover	Y	Y
Herring gull	Y	Y
Kestrel	Y/B	Y
Red kite	Y	
Lapwing	Y/B	Y/B
Lesser black-backed gull	Y	Y
Mallard	Y	
Merlin	Y	
Oystercatcher	Y/B	Y/B
Short-eared owl	Y/B	
Snipe	Y/B	Y/B
Teal	Y	

Breeding Raptor and Owl Searches

Two pairs of short-eared owl were recorded breeding off-site, but within the buffer in 2017. One pair was recorded breeding off site, but within the buffer in 2018. At least two pairs of buzzard were recorded breeding on the site and a single pair of kestrels was recorded breeding on site in 2017.

Black Grouse Searches

No leks were recorded within the project area or its 1.5 km buffer.

3.2.5.6 Potential Impacts

The main potential risks to birds presented by wind farms are:

- Direct habitat loss through construction of wind farm infrastructure.
- Displacement (indirect habitat loss) of birds avoiding the wind farm and its surrounding area due to turbine construction and operation, including barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds; and
- Collision with turbine blades and other infrastructure.

Construction

Direct habitat loss and displacement impacts may affect birds during the construction phase of the proposed wind farm.

Operation

Collision, displacement and barrier impacts may affect birds during the operational phase or the proposed wind farm.

Decommissioning

Displacement through disturbance may affect birds during the decommissioning phase, and habitat creation and removal of turbines would remove potential collision, displacement and barrier impacts following the completion of the decommissioning phase.

3.2.5.7 Method of Assessment

A full assessment will be conducted on the potential impacts of the proposed wind farm to ornithological interests at the site. The assessment will follow the Institute of Ecology and Environmental Management Guidelines (2016) and SNH guidance[7]. It will include the following sections:

- Summary, providing an overview of the assessment findings.
- Baseline evaluation including desk study and survey methods and results.
- Assessment of impacts arising from the proposed project:
    - The magnitude of the predicted impacts of the proposed wind farm on ornithology will be assessed. Direct and indirect impacts will be

[7] SNH (2018) Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas

considered for the three phases of the proposed project (construction, operation and decommissioning). Impacts such as habitat loss and disturbance or collision mortality will be assessed for the proposed project and as a cumulative impact with other consented and operational developments.

  - The significance of the effects of the proposed project on ornithology will be assessed. The significance will take account of the magnitude and duration of the predicted impacts in combination with the conservation status of affected species on a local, regional, national and international scale.

- Mitigation will be proposed where any impact from the proposed wind farm results in a significant effect on ornithological interests at or nearby the site.
- Figures showing the survey results will be presented, overlaying the proposed project infrastructure.

Important Ornithological Features

The assessment of value of ornithological receptors will be assessed from international (individuals of species cited on RAMSAR or SPA sites that are linked to the proposed wind farm site), National (individuals of species for which a SSSI is notified that are linked to the proposed wind farm site; a local population of more than 1% of the national population of a species; Any sensitive species with fewer than 300 breeding pairs in the UK; EU Birds Directive Annex 1 or species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)), Regional (regionally important population of a species because of population size; UK BAP or Scottish Biodiversity List species) Local (any other species of conservation interest e.g. birds listed on the Birds of Conservation Concern).

Significant Effects

Significant effects will be determined by taking account of the value of the ornithological receptor on an international to local scale, and the magnitude of the impact. The CIEEM guidelines do not support the use of a matrix to determine significance levels. Generally, internationally important receptors will be more likely to be significantly affected by lower magnitude impacts than locally important receptors.

Cumulative Impacts

The cumulative assessment will be undertaken in line with SNH guidelines[8]. Additive cumulative impacts will be identified for the species identified at the site (see above) within the Natural Heritage Zone (NHZ).

Habitats Regulations Assessment

Due to the low number of pink-footed geese overflying the site, it is considered that there will not be a requirement for a Habitats Regulation Assessment (HRA) in association with the two SPAs listed above.

[8] SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments

Consultation

Consultation was conducted with SNH at an early stage to agree the survey methodology for ornithological interests.

Matters Scoped Out

No species were scoped out during the initial consultation with SNH. We propose scoping out the need for consideration of black grouse.

3.2.5.8 Mitigation

Mitigation will be recommended where it is considered necessary to reduce or eliminate significant adverse impacts. The effect of the mitigation will be incorporated into the assessment process to demonstrate the predicted post-mitigation impacts

3.2.5.9 Enhancement

Where significant adverse impacts cannot be mitigated, compensation and enhancement measures may be recommended to offset the adverse impacts. This may include habitat enhancement, for example the reduction in grazing pressure or other measures to increase the value of areas of the site in terms of foraging or breeding habitat. To avoid conflicting aims of mitigation (see above) habitat enhancement may be required away from areas of high risk.

3.2.5.10 Presentation of Sensitive Information

Records showing the breeding locations of schedule 1 species will be presented within a confidential annex. This will ensure that sensitive information on protected species is protected, but other information on these species that are considered non-sensitive will be provided in the chapter.

3.2.6 Hydrology

3.2.6.1 Introduction

The hydrology assessment will involve a baseline study of the hydrological setting of 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 a site walkover and preliminary in situ water quality testing of site watercourses and relevant private water supply sources. The assessment will take into account current legislation and relevant statutory and general guidance.

3.2.6.2 Preliminary Environmental Baseline

The proposed project area is located in an area of dissected upland comprising areas of plateau divided by often deeply incised watercourse valleys. The land consists of mixed heather moorland, rough grazing and pasture with shelter-belts of woodland in places.

Surface Waterbodies

Gala Water – Armet Water confluence to River Tweed

Most of the project area is located within the Gala Water catchment. The Brockhouse Burn, Howliston Burn, Comely Burn and Still Burn are all tributaries to the Gala Water and provide the main drainage from the project area. The Gala Water is located east of the project area and flows mainly south-east in this area, to join the River Tweed at Galashiels.

The Gala Water has been designated as a heavily modified water body on account of physical alterations that cannot be addressed without a significant impact from an increased risk of subsidence or flooding. The Gala Water was classified by SEPA in 2014[9] as having 'moderate ecological potential' with respect to its physical condition resulting from modification to bed, banks and shores, but has 'high' status for fish migration access, water flows and levels and for freedom from invasive species, and 'good' status for water quality. During construction activities, best practice methods would be employed to minimise the impact of site works on the watercourse.

A review of SEPA's 'Indicative River & Coastal Flood Map'[10] indicates that flooding from a 1-in-10 year event (classed as high risk) is largely confined to the floodplain for the Gala Water, with minor flooding potential confined to the lower channels of the main tributaries near the project area.

Heriot Water/Blackhope Water

The Heriot Water and Blackhope Water catchment covers the northernmost part of the project area. Drainage from the project area is provided by the Corsehope Burn and Dead Burn, which join the Heriot Water shortly before its confluence with the Gala Water. These watercourses mainly flow east or north-east.

The Heriot Water/Blackhope Water was classified by SEPA in 2014[9] as having 'good' overall status, with 'good' physical condition and water quality, and 'high' status access for fish migration, water flows and levels and freedom from invasive species. During construction activities, best practice methods would be employed to minimise the impact of site works on the watercourse.

A review of SEPA's 'Indicative River & Coastal Flood Map'[10] indicates that flooding from a 1-in-10 year event is largely confined to the floodplain for the Heriot Water with minor flooding potential confined to the lower part of the Corsehope Burn below Corsehope Farm.

Lugate Water

The Lugate Water catchment covers the southernmost part of the project area. Drainage from the project area is provided by the Heathery Burn, Fearnie Grain Sit Burn and Thrashie Burn, which drain south to meet the Lugate Water mainstem. The Lugate Water flows east then south-east to join the Gala Water.

The Lugate Water was classified by SEPA in 2014[9] as having 'good' overall status, with 'good' physical condition and 'high' water quality, access for fish migration, water flows and levels and freedom from invasive species. During construction activities, best practice methods would be employed to minimise the impact of site works on the watercourse.

[9] SEPA: Water Environment Hub, https://www.sepa.org.uk/data-visualisation/water-environment-hub/

[10] SEPA: Flood Map, http://map.sepa.org.uk/floodmap/map.htm

A review of SEPA's 'Indicative River & Coastal Flood Map'[10] indicates that flooding from a 1-in-10 year event is largely confined to the floodplain for the Lugate Water. None of the tributaries within the project area show any flood risk.

Private Water Supply

Several springs and wells are indicated on Ordnance Survey mapping for the project area and its immediate surroundings and the Drinking Water Quality Regulator's online mapping[11] indicates that there are around 10 private water supply sources within and near to the project area. Given the rural nature of the area, it is likely that some of the farms and isolated houses are reliant on private water supplies from springs, wells or surface water sources.

Information on private water supplies (PWS) will be sought from the Scottish Borders Council's Environmental Health Department, SEPA and Scottish Water, and from local landowners where possible, to identify any confirmed or potential PWS within the immediate vicinity of the site. Locations will be confirmed where possible during the site survey.

Site Conditions

Previous site surveys have confirmed that the site is characterised by dissected moorland plateau, mainly used for upland grazing and seasonal shooting, with small areas of plantation forestry.

3.2.6.3 Potential Impacts

Potential impacts on hydrology and flooding from all phases of the proposed development will be assessed. Particular emphasis will be given to potential impacts on water quality and to PWS sources.

Potential impacts that will be considered include:

- Changes to water quality, including sediment release and accidental spillage of contaminants such as fuel or oils;
- Changes to water quantity and flow paths, including installation of watercourse crossing structures;
- Temporary and long-term drainage infrastructure;
- Changes to private water supplies, either quality or quantity; and
- Changes to flood risk.

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.

3.2.6.4 Method of Assessment

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

[11] DWQR: Private Water Supplies mapping, https://dwqr.scot/private-supply/pws-location-map/

- Topographical mapping, including vector datasets available from the Ordnance Survey, to identify hydrological catchment areas;
- High-resolution aerial or satellite imagery of the project area and its immediate surroundings;
- The Flood Estimation Handbook webservice;
- Private water supply data held by the Drinking Water Quality Regulator for Scotland;
- Water quality information held by SEPA;
- Any drinking water borehole data that might be available. These will be sourced from records held by the British Geological Survey (BGS) and other sources as available;
- Overview flood risk information held by SEPA; and
- Data gathered from site visits, including details of proposed watercourse crossing locations, any evidence of past flooding and PWS details.

Consultation will be held with the following organisations:

- Scottish Environment Protection Agency (SEPA);
- Scottish Borders Council;
- Nature.Scot (previously Scottish Natural Heritage);
- Scottish Water;
- Local landowners and, where relevant, estate tenants; and
- 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 buffers around all watercourses and waterbodies within the development area, buffers around well and spring sources and any PWS sources that are identified, areas of flood risk and areas where watercourse channels are identified as incised and are less suitable for planned crossing structures.

Following the desk study and data gathering exercise, a site reconnaissance and walkover survey will be undertaken by a hydrology specialist. The reconnaissance and walkover will visit all areas identified as potentially at risk from the proposed development, such as watercourse crossing locations and any PWS sources. Attempts will also be made to identify or trace PWS pipework and associated infrastructure where this may interact with the proposed development.

An impact assessment exercise will be undertaken once a frozen layout is provided, to identify any potential impacts to hydrology and flood risk arising from the proposed development, taking into account the findings from the desk study, consultation and reconnaissance survey. Where relevant, mitigation and control measures will be put forward to manage or mitigate any potential impacts to sensitive receptors that may arise from the proposed development.

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 geological, hydrogeological and peatland setting of 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 and relevant statutory and general guidance.

3.2.7.2 Preliminary Environmental Baseline

Bedrock Geology[12]

The project area is underlain by bedrock belonging to the Gala Group, of Silurian age. The bedrock is described as massive grits with greywacke, siltstone, shales and flaggy sandstones in varying proportions. The northernmost part of the area, near Brockhouse Burn, is underlain by older Ordovician age bedrock. This is similar to the Gala Group strata, consisting of greywacke, grits, shales and conglomerates.

Occasional dykes are noted across the project area. These are mainly microgranites and follow a north-east to south-west trend.

There are several regional compression (thrust) faults in the vicinity of the site, although none directly within the project area. These are all oriented north-east to south-west and are associated with the regional movement on the Southern Uplands Fault system, which forms the northern boundary of the Southern Uplands region of south Scotland.

Superficial Geology[12]

The project area is largely without superficial deposits. The watercourse valleys have glacial deposits of diamicton till on the side slopes and narrow ribbon deposits of alluvium along the watercourse channels. The diamicton is a very heterogeneous mix of sediment ranging from cobbles through sand to clay size particles. The alluvium is mainly a mix of silt, sand and gravel.

The Gala Water valley is shown to have more significant deposits of alluvium, located across the main valley floor.

Soils and Peat

The project area soils are mainly humus-iron podzols with brown forest soils at lower levels. A small area of blanket peat is indicated around the summit of Mount Main but is not extensive[13].

There are no nationally important carbon-rich soils identified within the project area[14]. The majority of the area is shown to have mineral soils with no peatland vegetation. Small areas of the site have peat soils with no peatland vegetation; these include the area around the summit of Mount Main.

Initial peat depth surveys of the project area confirm that peat is largely absent from the site, with four small pockets of peat (<1.0 m) identified, each with very limited spatial extents. These isolated peat deposits are shown on Figure 7.1 (Preliminary peat depth survey).

[12] BGS: GeoIndex, http://mapapps2.bgs.ac.uk/geoindex/home.html

[13] Scotland's Soils: National Soil Map of Scotland, https://map.environment.gov.scot/Soil_maps/?layer=10#

[14] Scotland's Soils: Carbon and Peatland 2016, https://map.environment.gov.scot/Soil_maps/?layer=10#

Hydrogeology

The project area is entirely underlain by bedrock classed as having low to very low productivity fracture flow. The superficial deposits are mainly classed as low productivity or unproductive, with some areas of the alluvial deposits within the watercourse channels are identified as having low productivity. There are no moderate or high productivity deposits near the project area.

The groundwater vulnerability is considered to be Class 5[15]. Vulnerability Class 5 is described as 'Highly vulnerable to those pollutants not readily adsorbed or transformed' and indicates that the groundwater present within the project area has a high level of vulnerability to individual events where potentially contaminating substances are involved.

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 marshy area. Although vegetation mapping is not currently available for the project area, potential GWDTE have been identified in similar habitats on other sites and it is assumed that some areas may occur within the project area.

Designated Sites

There is one designated area within 5 km of the project area. The Moorfoot Hills is designated as a Special Area of Conservation and a Site of Special Scientific Interest. Qualifying features of relevance to geology, hydrogeology and soils are blanket bog, European dry heath and upland birch woodland.

The Moorfoot Hills SAC and SSSI is located adjacent to the southern and eastern project area boundaries.

3.2.7.3 Potential Impacts

Potential impacts on geology, groundwater, soils and peat from all phases of the proposed development will be assessed. Particular emphasis will be given to potential impacts on peat and carbon-rich soils, where present, 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;
- Damage to soil and peat from traffic movements and from handling, transport and storage of excavated material; and
- 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.

[15] BGS: Groundwater Vulnerability User Guide, http://nora.nerc.ac.uk/id/eprint/17084/1/OR11064.pdf

3.2.7.4 *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, including carbon and peatland 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; and
- Data gathered from site visits, including existing peat depth and vegetation surveys and any material arising from future site surveys that may be relevant.

Consultation will be held with the following organisations:

- Scottish Environment Protection Agency (SEPA);
- Scottish Borders Council;
- Scottish Natural Heritage;
- Local landowners and, where relevant, estate tenants; and
- 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 any areas of 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 GWDTE and areas identified for aggregate extraction. Any sites indicated to have peat deposits will also be visited. Preliminary peat depth probing will be extended to fully determine the extent of peat soils on the site, in particular in the four areas identified to contain peat.

Given the findings of preliminary peat probing, it is anticipated that the presence of peat soils will be very limited, and that where present, they will be relatively shallow (i.e. less than 1.0 m) and avoidable. The depths and extent of peat soil identified during probing indicate that peat landslide risks are likely to be very low to negligible, particularly if these soils can be avoided through design. Equally, it may be possible to prevent excavation of peat soils through avoidance. In the event that the proposed wind farm layout can be demonstrated not to overlap with peat soils (where defined as >0.5 m in depth), it is recommended that neither a peat landslide hazard and risk assessment nor peat management plan would be required. It is therefore proposed to scope out the peat landslide hazard and risk assessment and the peat management plan.

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

3.2.8 Noise

3.2.8.1 Introduction

Noise can arise from both the construction, operation and the decommissioning of windfarms. The noise assessment will therefore evaluate the effects of the construction and decommission activities and operational noise of the proposed development on nearby noise sensitive receptors. This section of the Scoping Report has been prepared by Hoare Lea, who will also undertake the noise assessment for the EIA.

3.2.8.2 Policy and Guidance

The following policies are of relevance to the noise assessment:

- Scottish Planning Policy;
- Planning Advice Note PAN1/2011
- Onshore Wind Turbines (web-based planning advice note)

Scottish Planning Policy requires consideration of potential noise impacts for developments such as this, but provides no specific advice on noise. Planning Advice Note PAN1/2011 provides general advice on preventing and limiting the adverse effects of noise without prejudicing economic development. It makes reference to noise associated with both construction activities and operational windfarms.

The web-based planning advice note on 'Onshore wind turbines' provides further advice on noise, and confirms that the recommendations of ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms'[16], "should be followed by applicants and consultees, and used by planning authorities to asses and rate noise from wind energy developments".

Good practice in the application of the ETSU-R-97 methodology will be referenced, as set out in Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97[17]. This includes guidance on the assessment of cumulative operational noise impacts from wind farms.

PAN1/2011 and the Technical Advice Note accompanying PAN1/2011 provide further advice on construction noise and make reference in particular to British Standard BS 5228. Furthermore. the Control of Pollution Act 1974 provides different means for local authorities of controlling construction noise and vibration.

3.2.8.3 Preliminary Environmental Baseline

The proposed development Site is located in an area of low population density, with a settlement at Fountainhall to the east and individual farmhouses. The noise environment

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

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

in the surrounding area is expected to be characterised by mainly 'natural' sources, such as: wind disturbed vegetation, birds and farm animals, with a varying influence of noise from local roads and water courses in some cases.

For the EIA, 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-R-97 requires that any baseline noise measurements are not significantly influenced by existing operational turbines, to prevent unreasonable cumulative increases. Care will be needed when selecting suitable locations given the presence of individual small-scale turbines in the area.

The proposed baseline measurement locations will be selected in consultation with the Environmental Health Department of Scottish Borders Council. It is expected that noise monitoring at around two or three properties will be proposed to provide appropriate representative data.

3.2.8.4 Potential Impacts

During construction and decommissioning, noise could arise from both on-site activities, such as the construction of access tracks, turbine foundations, the control building (substation) etc., and quarrying of borrow pits and from the movement of construction related traffic both on site and travelling on public roads to and from the proposed development.

Traffic volumes associated with operation of the proposed development is expected to be relatively low. Similarly, given the nature of works involved in the construction of a windfarm and distances to neighbouring dwellings, the risk of significant effects relating to ground borne vibration during construction is generally very low.

During their operation, windfarms 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.

3.2.8.5 Effects scoped out

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.

With regard to infrasound and low frequency noise, the above-referenced online planning advice note, Onshore wind turbines, refers to a report for the UK Government which concluded that 'there is no evidence of health effects arising from infrasound or low frequency noise generated by the wind turbines that were tested'. The current recommendation is that ETSU-R-97 should continue to be used for the assessment and rating of operational noise from wind farms.

It is therefore not proposed to undertake specific assessments of infrasound and low frequency noise, but the noise chapter of the EIA report will consider the latest supporting information on these subjects and the topic of wind turbine blade swish or Amplitude Modulation (or AM).

Regarding construction impacts, it is considered unlikely that the construction programme for sites considered in the cumulative study, and the location of the works (and/or access tracks) is likely to overlap such that additional significant cumulative impacts would arise. It is therefore proposed to scope out consideration of cumulative construction noise and vibration impacts.

3.2.8.6 Method of Assessment

1.1.1.1.1 Construction and Decommissioning

In assessing the impact of noise and vibration from the construction and decommissioning activities, 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 and decommissioning will be undertaken in accordance with the BS 5228 British Standard guidance 'Code of practice for noise and vibration control on construction and open sites: Noise'. 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[18]. This standard is referenced in Technical Advice Note to PAN 1/2011: Planning and Noise[19]. 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[20] considers construction vibration and this will also be referenced.

Any blasting if used for rock extraction at borrow pits may also create vibration and air overpressure which may require attention.

Consideration will also be given to the potential impact of construction traffic on sensitive receptors in the area. Depending upon the outcome of the assessment of traffic for the Traffic and Transportation chapter of the EIA Report (refer to Section 3.2.9 of this report), the impact of traffic along the Site access route will be assessed on the basis of the methodology within BS 5228-1, and the 'Calculation of Road Traffic Noise'[21] publication, where appropriate.

The assessment of the temporary effects of construction and decommission 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.

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. For construction traffic, the criteria set out in the Design Manual for

[18] BS 5228-1:2009 (amended 2014) 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'

[19] Planning Advice Note (PAN) 1/2011 and associated Technical Advice Note.

[20] BS 5228-2:2009 (amended 2014) 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'

[21] Calculation of Road Traffic Noise, HMSO Department of Transport, 1988.

Roads and Bridges[22] are also likely to be referenced. Construction noise management procedures will also be determined.

1.1.1.1.2 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; and
- Compare the calculated wind farm noise emission levels with the derived noise limits.

The good practice guidance referenced above will be taken into account, including advice on baseline survey, wind shear assessment and noise prediction methodology.

The calculated wind farm noise emission levels will be compared with the noise limits derived in accordance with ETSU-R-97. 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. Specifically, in addition to individual small-scale turbines in the area, the Carcant and Toddleburn wind farms were identified to the north-west and north-east respectively. Other existing or proposed wind farms are located further away and likely to have negligible contribution and so will not be considered in any further detail.

3.2.9 Traffic and Transportation

3.2.9.1 Introduction

This chapter of the EIA Report will consider the potential environmental effects associated with increased road traffic generated during the construction phase of the proposed development, including access routes and measures to minimise disruption to the local road network. Cumulative effects will also be assessed.

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;

[22] Design Manual for Roads and Bridges (LA 111: 2019), Highways England, Transport Scotland, etc., Nov 2019.

- 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);
- Scottish Borders Council Transport Strategy (2007/8); 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. Responses have yet to be received from either the Scottish Borders Council transport planning team or from Transport Scotland.

Further consultation will be undertaken with Transport Scotland and the Scottish Borders 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 Preliminary Environmental Baseline

The proposed development is located within the Scottish Borders, approximately 2 km south of Heriot and 2.5 km west of Fountainhall. The site is also situated upon upland grazing land, with small parcels of plantation forestry.

It is anticipated that the largest volume of traffic would be associated with the construction phase of the project, when vehicles are likely to be journeying south from the port of Rosyth in Fife, as this is the closest port of entry for abnormal loads. Such loads would proceed via Keith Road, before journeying east through a series of roundabouts towards the M90. Loads would then journey south to the Queensferry Crossing Bridge and join the M8 heading east before joining the A720 at Hermiston roundabout. Construction traffic would then proceed to join the A7 at Sheriffhall Roundabout, journeying southbound for approximately 14.5 miles before turning right at Fountainhill and reaching the site access point at Old Stage Road.

These roads are predominantly A classified roads and motorways, with the A roads operating at an urban speed limit of 30/40 mph and a rural speed limit of up to 60 mph. The A7, which is the closest trunk road within the vicinity of the project area, is located 2.5 km east of the site, and forms part of the primary road network. It is designed as a long distance road carrying a wide range of vehicle types, including goods vehicles.

The A7 also runs through several urban areas, including Galashiels, Newtongrange and Gorebridge. It is possible that construction workers may reside within such areas, providing an accessible connection for those that may journey to the site from such areas.

Transport network users

A reasonable pedestrian network exists within the urban areas of Galashiels, Newtongrange and Gorebridge, including along the A7 where this road passes through. Each offer street-lit footways with dropped kerbs at crossing points along the A7 stretch, and several official crossing points in Galashiels, signalised crossing points within Newtongrange and pedestrian islands in Gorebridge. Although there are no pedestrian facilities along the A7 in the vicinity of the site, there is also negligible pedestrian traffic in this area.

There are no bicycle friendly roads/lanes along the A7 in close proximity to the site, however NCN Route 1 (3.5 km west of the site) runs parallel to the A7 from Bonnyrigg before reaching Innerleithen to the south. The route then proceeds east and is accessible from Galashiels via the A7. The route is also accessible from the B704, north of Newtongrange, or via the B6372, south of Gorebridge. The route offers a connection to the site if leaving the route via the B709 towards Heriot, connecting to Old Stage Road to the east, and offering site access to the south.

The X95 bus service runs along the A7 corridor, passing through various towns and villages. The route originates in Edinburgh and travels southbound to Carlisle. The Route offers several services in each direction, roughly every 1 to 2 hours from morning to evening.

3.2.9.4 Potential Impacts

The potential impacts of the proposed development 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. This may include residents within Newtongrange and Gorebridge specifically. For example:
- It is possible that the section of the A7 running through Newtongrange and Gorebridge may have a reasonable level of pedestrian and potentially cyclist activity, due to housing situated along this road. It is possible that pedestrian/cyclist safety along this road may be compromised due to an increase in HGV's during the construction phase of the development. Such an influx in traffic may also increase levels of noise, visual and air pollution, impacting pedestrians/cyclists and those whose homes are situated on the A7 within Newtongrange and Gorebridge.
- Temporary impacts to local road users, including public transport, 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. For example:
    - An increase in traffic due to construction activities may impact the reliability and frequency of the X95 bus service described above. This is due to potential congestion if there are high volumes of unprecedented construction traffic, impacting those that may use the local services.

Indirect impacts as described above (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 would not generate traffic volumes greater than that experienced during the construction stage as it would predominantly reflect reversal of the construction activities.

Once construction of the proposed development is complete, the effect on the local road system would be minimal. There would be no permanent staffing needed at the proposed development, but access would 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.

Investigations have shown that suitable traffic data for the roads within the study area is obtainable from the DfT to establish the baseline volumes, including proportions of goods vehicles. A summary of the relevant Annual Average Daily Flow (AADF) data is provided in Table 9.1.

Table 9.3.3: Summary of AADF Counts

Location	Year	AADF Counts	
		All vehicles	All vehicles
A7 – north of A768	2018	22,462	22,462
A7 – south of A768	2018	23,014	23,014
A7 – north of site	2018	5,585	5,585
A7 – south of site	2018	5,670	5,670
A7 – Galashiels, north of A72	2018	5,327	5,327
A7 – Galashiels, south of A72	2018	8,814	8,814

Injury accident data for the roads within the study area will be obtained from the DfT to ensure that any road safety issues are identified.

The EIA chapter will include a brief construction works programme, a description of the type of vehicles used during the construction phase and an estimate of the number of trips anticipated to be generated by HGVs, LGVs and other vehicles. Once the likely volume of traffic has been identified, the traffic will be assigned to the road network using broad assumptions based on likely origins of materials and personnel.

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. The environmental effects that may be assessed are namely:

- severance;
- driver delay;
- pedestrian delay and amenity; and
- accidents and safety.

'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*

Once the proposed development is operational, there would be little traffic associated with the development apart from occasional maintenance vehicles which would 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 Socio-economic, Land-use and Tourism

3.2.10.1 *Introduction*

This section will consider the socio-economic, tourism and recreation effects potentially arising from the proposed development. It will involve: identifying the baseline socio-economic, tourism and recreation conditions and potential receptors; how these may be impacted by the proposed development; proposed mitigation; and residual effects arising once mitigation is taken into account.

3.2.10.2 *Guidance*

There are no UK regulations or standards to guide a socio-economic, tourism and recreation impact assessment and therefore the assessment would be informed by professional experience and knowledge. Nevertheless, the predicted impacts will refer to guidance provided within 'Handbook for EIA' published by Scottish Natural Heritage in 2013. Reference to other technical assessments, where relevant to the proposed development will be made, e.g. landscape and visual assessment, noise, cultural heritage, and traffic and transportation assessment.

3.2.10.3 *Baseline Description*

Socio-economics

The project area is located in the Scottish Borders, 2 km south of Heriot and 2.5 km west of Fountainhall. It is located within the Stow and Fountainhall local community council area. Current land uses include upland rough grazing, improved pasture and small blocks of plantation forestry, primarily shelterbelts for grazing animals.

The population of the Scottish Borders was 115,300 in 2018, of which 59.1% are aged between 16 and 64. At 78.8%, the proportion of the population that is economically active is very similar to the Scottish and UK averages (77.8% and 78.9% respectively).[23]

In comparison to the rest of Scotland, the population of Scottish Borders has increased by 8.7% over the period 1998 – 2018, similar to an overall population increase in Scotland of 7.1% over the same period[24]. The National Records of Scotland anticipate the population will continue to increase by 1.0% between 2016 and 2026, in contrast to an overall population increase for Scotland of 3.2%.

[23] NOMIS Web reports: https://www.nomisweb.co.uk/reports/lmp/la/1946157430/report.aspx [accessed April 2020]

[24] National Records of Scotland: https://www.nrscotland.gov.uk/files//statistics/council-area-data-sheets/scottish-borders-council-profile.html [accessed April 2020]

As of 2017, onshore wind supported around 7,500 jobs in Scotland (or 58% of total onshore wind employment across the UK). avoid the impact of shadow flicker on any receptors identified.

To identify and model receptors, OS base-maps, Address Base Plus, Google Streetview and aerial photography would initially be used to identify all buildings within the assessment area that are residential, commercial (shops, offices etc.) or other non-residential buildings (schools, hotels etc). For each building, RSK would assess which have façades that could be affected by passing shadows from the blades of the proposed turbine(s). Note that windows in façades at slightly oblique angles may also be affected in addition to those windows that directly face the turbines. Consequently, it is not unusual for buildings to have several façades that need to be included in the analysis.

Each identified building would be modelled in appropriate software, such as WindFarm. Once set, the flicker analysis based on the turbine(s), receptors and established parameters would be run. Once analysis has run, a shadow flicker contour file (.kgm) would be generated and exported to a JPEG image that depicts the shadow flicker contours out to a distance of 10 rotor diameters from all the turbines used in the analysis. The anticipated impacts, proposed mitigation and residual effects will be presented within the EMI, Shadow Flicker and Aviation chapter of the EIA report.

3.2.10.4 Aviation

Introduction

This section considers the issues and potential concerns associated with aviation and radar, resulting from the proposed development during the construction, operation and decommissioning phases.

Guidance

CAA guidance, within CAP 764 (CAA Policy and Guidance on Wind Turbines), sets out recommended consultation and assessment criteria for the impacts of wind turbines on all aspects of civil aviation.

The CAA involvement in the Wind Farm Pre-Planning Consultation Process has ceased; CAP 764 now states that “developers are required to undertake their own pre- planning assessment of potential civil aviation related issues” and that “it is incumbent upon the developer to liaise with the appropriate aviation stakeholder to discuss – and hopefully resolve or mitigate – aviation related concerns without requiring further CAA input.”

As a statutory consultee, the MOD will be consulted through the Section 36 scoping application. They publish a guidance document on www.gov.uk called ‘Wind farms: MOD safeguarding’, Updated 9 February 2018. The MOD wind energy team liaises with a broad range of experts to formulate a comprehensive MOD response. Where the MOD has concerns about a development the team will work with the developer to look for ways to mitigate them.

Baseline Description

The proposed development site lies within the MOD safeguarding zone for the Eskdalemuir seismological array. This is a 100 km diameter circular area centred within the Eskdalemuir Forest. Because wind turbines generate noise at the low frequencies

detected by the array, the MOD manage the total noise generated by wind turbines within this safeguarded area and object if the noise budget is exceeded.

The turbines are not visible to any civil aviation radar, hence no objection is expected from NATS or Edinburgh Airport.

Because the proposed turbines would be over 150 m tall, there would be a requirement for aviation obstacle lighting.

Method of Assessment

The acceptability of the proposed development, in terms of net effects on aviation related interests, is established through direct consultation with all relevant stakeholders within the consenting process. The initial task is to independently assess the potential effects and where significant effects may occur, to enter a dialogue with the affected stakeholders. Where impacts are of concern additional analysis may be required and where impacts are deemed unacceptable, mitigation solutions identified and explored with the goal of reducing impacts to acceptable levels. While the aim of this dialogue is to enable the approval of all stakeholders before full submission, this is not always possible. In the case of impacts, typically solutions are identified but do not reach full maturity in terms of the assessment by the stakeholders and the contracting of mitigation (where required) until formal consent applications have been submitted.

The initial impact assessment aims to exhaustively identify all stakeholders potentially affected by the proposed development. This involves considering all military and civil aerodromes in the wider area out to circa 60 km, all radar installations out to the limit of their range, all navigational aids, air-ground-air communications stations and low flying activities. A provisional lighting design will be generated to inform the LVI assessment. This will need to be finalised post consent, through agreement with the CAA before construction.

3.2.11 Climate Change

3.2.11.1 Introduction

A key benefit of renewable energy 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, renewable energy developments 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.

3.2.11.2 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 (CO_2) 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.

3.2.11.3 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 a Climate Change 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 (as amended), 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;
- Risk of turbine failure and consideration of in built emergency procedures and best practice; and
- Risk of transmission or spread of Covid-19 as a result of construction or operation activities.

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.

Consideration of the risk of transmission or spread of Covid-19 will be necessary within the project description section of the EIA report. The applicant commits to working in accordance with the relevant UK and Scottish Government advice and regulations on minimising the spread of Covid-19 applicable at the time of construction of the proposed development.

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 UKCP09 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

4 CONSULTATION

4.1 Public Consultation

In accordance with established good practice, the applicant is currently planning to arrange 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. Standard practice would be to host these public consultation events in a public space to exhibit the display boards and for members of the project team to answer questions from the public. This is the preferred approach of the applicant. However, in light of the restrictions on public meetings coming from UK Government advisers as a result of COVID-19, both the applicant and RSK are considering contingency approaches for delivering inclusive and effective public consultation events.

The alternative approaches will be based on remote and/or virtual methods of consultation so the public can participate from the safety of their own homes. It is key that that the consultation methods adopted allow for proper engagement with local communities. The applicant respects that not all members of the public will have access to the same level of technology so it is likely that a multifaceted approach will be taken to ensure consultation is fully inclusive.

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 is 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

Associate Director

RSK Environment Ltd

65 Sussex St

Glasgow

G41 1DX

Tel: 0141 418 0471

Email: jsomerville@rsk.co.uk

5 REFERENCES

5.1 Publications

[Guidance Note] BS 5228-1:2009 (amended 2014), 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'.

[Guidance Note] BS 5228-2:2009 (amended 2014), 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'.

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

[Report] Department of Energy and Climate Change, 'Update of UK Shadow Flicker Evidence Base'.

[Report] Design Manual for Roads and Bridges (LA 111: 2019), 'Highways England, Transport Scotland, etc., Nov 2019'.

[Report] HMSO Department of Transport (1988), 'Calculation of Road Traffic Noise, HMSO Department of Transport'.

[Report] Mitchell, C. (2012). 'Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland', Wildfowl & Wetlands Trust/ Scottish Natural Heritage Report, Slimbridge.

[Guidance Note] Planning Advice Note (PAN) '1/2011 and associated Technical Advice Note'.

[Report] Scottish Borders Council (2011), 'Wind Energy', Supplementary Guidance.

[Guidance Note] SNH (2016), 'Assessing Connectivity with Special Protection Areas (SPAs)'.

[Guidance Note] SNH (2018), 'Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas'.

[Guidance Note] SNH (2012), 'Assessing the Cumulative Impact of Onshore Wind Energy Developments'.

[Guidance Note] SNH (2017), 'Recommended bird survey methods to inform impact assessment of onshore wind farms'. Version 2.

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

5.2 Websites

BGS: GeoIndex:

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

BGS: Groundwater Vulnerability User Guide:

http://nora.nerc.ac.uk/id/eprint/17084/1/OR11064.pdf

DWQR: Private Water Supplies mapping:

https://dwqr.scot/private-supply/pws-location-map/

Local Energy Scotland:

https://www.localenergy.scot/projects-and-case-studies/searchable-register-of-community-benefits/ [Accessed May 2020]

National Records of Scotland:

https://www.nrscotland.gov.uk/files//statistics/council-area-data-sheets/scottish-borders-council-profile.html [accessed April 2020]

NOMIS Web reports:

https://www.nomisweb.co.uk/reports/lmp/la/1946157430/report.aspx [accessed April 2020]

Scotland's Soils: Carbon and Peatland 2016:

https://map.environment.gov.scot/Soil_maps/?layer=10#

Scotland's Soils: National Soil Map of Scotland:

https://map.environment.gov.scot/Soil_maps/?layer=10#

Scottish Borders Core Paths Plan:

https://www.scotborders.gov.uk/directory/62/scottish_borders_core_paths [accessed April 2020]

Scottish Government. Onshore wind turbines: Planning advice (2013):

https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/

SEPA: Flood Map:

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

SEPA: Water Environment Hub:

https://www.sepa.org.uk/data-visualisation/water-environment-hub/

SNH Sitelink:

www.sitelink.nature.scot/home

The Wildlife Information Centre:

www.wildlifeinformation.co.uk

Visitscotland data 2019:

https://www.visitscotland.org/research-insights/regions/scottish-borders [accessed April 2020]

Visitscotland website:

https://www.visitscotland.com/see-do/tours/driving-road-trips/routes/planner/borders-historic-route/ [accessed April 2020]

APPENDIX 1 – LIST OF CONSULTEES

List of Statutory Consultees

Energy Consents Unit

The Scottish Borders 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

Transport Scotland

Marine Scotland

Scottish Forestry

List of Non-Statutory Consultees

Parish of Stow Community Council	Joint Radio Company (JRC)
Heriot Community Council	Crown Estate Scotland
West Lothian Council	BT
City of Edinburgh Council	Civil Aviation Authority
Midlothian Council	Ministry of Defence
Royal Society for the Protection of Birds (RSPB)	Defence Infrastructure Organisation
Scottish Wildlife Trust (SWT)	NATS Safeguarding
Tweed Foundation Fisheries Trust	Fisheries Management Scotland
River Tweed Commission District Salmon Fisheries Board	Mountaineering Scotland
Scottish Water	
National Grid	
Visitscotland	
Scottish Ornithologists Club	
Scotways	

APPENDIX 2 – FIGURES

Figure List

Figure
Figure 1.1: Project Layout
Figure 1.2: Proposed Turbine Locations
Figure 2.1: Landscape Context
Figure 2.2: ZTV and Proposed Viewpoints
Figure 2.3: ZTV and Proposed Viewpoints – Detailed
Figure 3.1: Heritage Assets within in the Inner Study Area
Figure 3.2: Heritage Assets within in the Outer Study Area
Figure 4.1: Designated Nature Conservation Sites
Figure 4.2: Phase 1 Habitat Map
Figure 4.3a: National Vegetation Classification Map
Figure 4.3b: National Vegetation Classification Map
Figure 4.3c: National Vegetation Classification Map
Figure 4.4: Protected Species Survey Findings
Figure 7.1: Preliminary Peat Depth Survey

328000 330000 332000 334000 336000 338000 340000 342000 344000 346000 348000 350000 352000

658000 656000 654000 652000 650000 648000 646000 644000 642000 640000

North Middleton
Temple
A7
Heriot
A68
Oxton
Fountainhall
Killochyett
Stow
Lauc

Legend:

Project Area

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

Rev	Date	Description	Drn	Chk	App
00	30/04/2020	First Draft	AJ	RB	RB

Greystone Knowe Wind Farm

RSK

TITLE: Figure 1.1:
Project Layout

ID:P662711_INF001_ProjectLayout_A3_L

0 1.5 3
Kilometres

Scale: 1:75,000 @ A3

N W E S

REV 00

Path: P:\600000 - Glasgow\662711 Greystone Knowe\01 - GIS\P662711.aprx\INF001_ProjectLayout

338000
340000
342000
652000
650000
648000
B709
A7
T15
T14
T12
T13
T11
T07
T06
T10
T03
T09
T02
T05
T04
T08
T01
Fountainhall

Legend:
- Project Area
- Proposed Turbine Locations

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

Rev	Date	Description	Drn	Chk	App
00	30/04/2020	First Draft	AJ	RB	RB

Greystone Knowe Wind Farm

RSK

TITLE: Figure 1.2:
Proposed Turbine Locations

ID:P662711_INF002_TurbineLocations_A3_L

0 0.4 0.8
Kilometres

Scale: 1:20,000 @ A3

N W E S

REV 00

Path: P:\600000 - Glasgow\662711 Greystone Knowe\01 - GIS\P662711 aprxINF002_TurbineLocations

290000 300000 310000 320000 330000 340000 350000 360000 370000 380000 390000

690000 680000 670000 660000 650000 640000 630000 620000 610000

28 Upper Tweeddale

29 Eildon and Leaderfoot

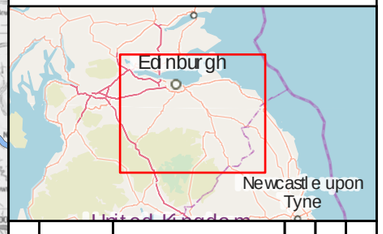
02. Talla-Hart Fell

EDINBURGH

Legend:

- Proposed Greystone Knowe Wind Turbines
- Distance Radii from Outermost Turbine (15, 30, 45 km)
- World Heritage Sites
  - WH2 Edinburgh World Heritage Site Boundary
  - WH6 Forth Bridge World Heritage Site Boundary
- National Scenic Areas
- Wild Land Areas
- Gardens and Designed Landscapes
- National Cycle Network
- Southern Upland Way

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



Rev	Date	Description	Drn	Chk	App
00	15/05/2020	First Draft	MP	ME	

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE: Figure 2.1: Landscape Context

ID:arcgis_SH001_CONTEXT-45KM_A3_L

0 5 10 15
Kilometres
Scale: 1:350,000 @ A3

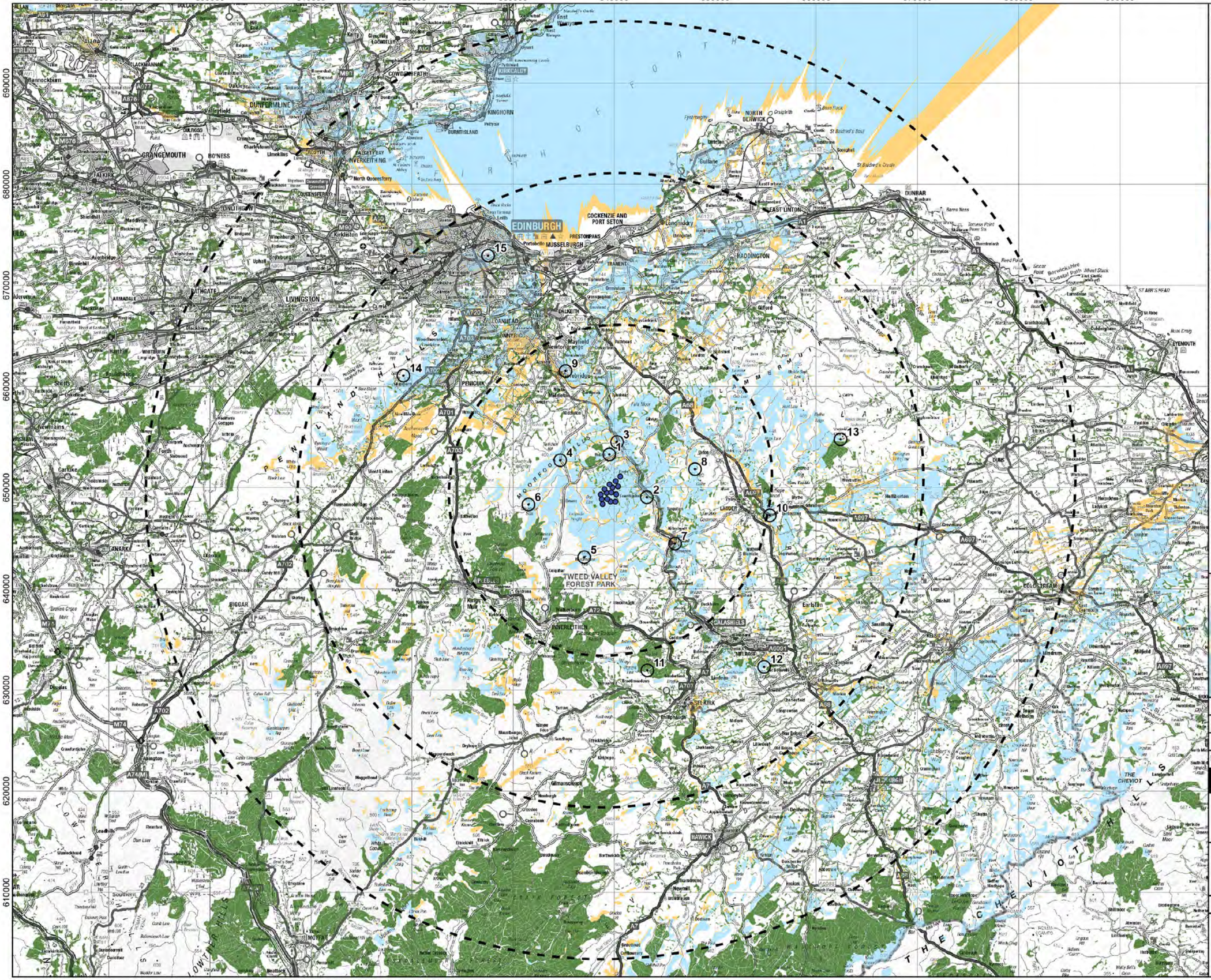
2

REV 00

Path: W:\5 User Area\Mo\export-settings\arcgis.aprx\

290000 300000 310000 320000 330000 340000 350000 360000 370000 380000 390000

690000 680000 670000 660000 650000 640000 630000 620000 610000



Legend:

- Proposed Greystone Knowe Wind Turbines
- Distance Radii from Outermost Turbine (15, 30, 45km)
- Viewpoints
- Woodland (modelled at 15m)

Zone of Theoretical Visibility

- Blade Tips (180m) may be visible
- Blade Tips and Hubs (110m) may be visible

NOTES:

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.

The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.

A digital surface model (DSM) has been derived from OS Terrain 50 height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7m and woodland an assumed height of 15m, representing a conservative estimate of average heights within the study area.

The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 50m^2 resolution.

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

Rev	Date	Description	Drn	Chk	App
01	20/05/2020	Tip Height Changed	MP	ME	
00	15/05/2020	First Draft	RF	ME	

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE: Figure 2.2: ZTV and Proposed Viewpoints

ID:P662711_SH_LAN_SH002_ZTV-45KM_A3_L

0 5 10 15
Kilometres

Scale: 1:350,000 @ A3

REV 01

Path: V:\GRS-LI\Graphics\P662711_SH_LAN.aprx\

Legend:

- Proposed Greystone Knowe Wind Turbines
- Distance Radii from Outermost Turbine (5, 10, 15km)
- Viewpoints
- Woodland (modelled at 15m)
- Blade Tips (180m) may be visible
- Blade Tips and Hubs (110m) may be visible

NOTES:

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.

The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.

A digital surface model (DSM) has been derived from OS Terrain 5 height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7m and woodland an assumed height of 15m, representing a conservative estimate of average heights within the study area.

The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $10m^2$ resolution.

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

Rev	Date	Description	Drn	Chk	App
01	20/05/2020	Tip Height Changed	MP	ME	
00	15/05/2020	First Draft	RF	ME	

Greystone Knowe Wind Farm

RSK

Coriolis Energy

TITLE: Figure 2.3: ZTV and Proposed Viewpoints

ID:P662711_SH_LAN_SH003_ZTV-15KM_A3_L

0 2.5 5
Kilometres
Scale: 1:120,000 @ A3

REV 01

Path: V:\GRS-L\Graphics\P662711_SH_LAN.aprx\

339000 340000 341000 342000 343000

651000 650000 649000 648000

Legend:

- Heritage Asset
- Turbine
- Inner Study Area

Notes:
This map contains data from the following sources:
HES Pastmap/Canmore Database (April 2020)

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

Rev	Date	Description	Drn	Chk	App
00	14/05/2020	First Draft	TJ	TJ	XX

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE:
Figure 3.1:
Heritage Assets within the Inner Study Area

0 0.3 0.6
Kilometres
SCALE: 1:15,000 @ A3

N W E S

REV 00

Document Path: N:\1projects\GKWF20 - Greystones Knowe WF, Scot Borders (TJ)\ProjectArchive\GIS\GKWF_CH_ScopingFig1.mxd

311000 313000 315000 317000 319000 321000 323000 325000 327000 329000 331000 333000 335000 337000 339000 341000 343000 345000 347000 349000 351000 353000 355000 357000 359000 361000 363000 365000 367000

673000 671000 669000 667000 665000 663000 661000 659000 657000 655000 653000 651000 649000 647000 645000 643000 641000 639000 637000 635000 633000 631000 629000 627000

5 km

20 km

Bowland

Legend:

- Category A Listed Building
- Category B Listed Building
- Category C Listed Building
- Property in Care
- Scheduled Monument
- Inventory Garden and Designed Landscape
- Inventory Historic Battlefield
- Conservation Area
- Distance from Turbines
- Inner Study Area

Notes:
This map contains data from the following sources:
HES Pastmap/Canmore Database (April 2020)

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

Rev	Date	Description	Drn	Chk	App
00	04/05/2020	First Draft	TJ	TJ	XX

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE:
Figure 3.2:
Heritage Assets within the Outer Study Area

0 3.5 7
Kilometres
SCALE: 1:170,000 @ A3

N W E S

REV 00

Document Path: N:\1projects\GKWF20 - Greystones Knowe WF, Scot Borders (TJ)\ProjectArchive\GIS\GKWF20_ScopingFig2.mxd

338000 339000 340000 341000 342000 343000 344000

652000 651000 650000 649000 648000 647000

Moorfoot Hills SAC

Moorfoot Hills SSI

River Tweed SAC

Legend:

- Project area
- Project area - 1 km buffer
- Proposed turbine layout
- Ancient woodland
- Important Bird Areas
- Ramsar
- RSPB reserve
- Special Area of Conservation
- Site of Special Scientific Interest
- Special Protection Area

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright
and database right 0100031673 [2020]

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

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE:
Figure 4.1:
Designated Nature Conservation Sites

0 0.4 0.8
Kilometres
SCALE: 1:20,000 @ A3

N W E S

REV 03

Document Path: C:\GIS\Etive_Ecology\Mount_main\MXD\P662711_A3_RSKECO01_Designations.mxd

339000 340000 341000 342000 343000

651000 650000 649000 648000

Legend:

- Project area
- Proposed turbine layout
- Semi-natural broadleaved woodland
- Tree planting - 2019
- Broadleaved plantation woodland
- Coniferous plantation woodland
- Mixed plantation woodland
- Dense scrub
- Felled ground
- Semi-improved acid grassland
- Semi-improved neutral grassland
- Calcareous unimproved grassland
- Calcareous / semi-improved acid grassland
- Semi-improved grassland & blanket bog
- Marshy grassland
- Marshy / semi-improved acid grassland & dense bracken
- Marshy grassland & semi-improved acid grassland
- Improved grassland
- Dense bracken
- Dense bracken & semi-improved acid grassland
- Tall ruderal
- Dry heath
- Dry / wet heath
- Dry heath & semi-improved acid grassland
- Wet heath
- Blanket bog
- Acid flush
- Arable
- Bare ground
- Built ground / railway / road
- Fence
- Wall
- Scattered tree

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright and database right 0100031673 [2020]

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

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE:
Figure 4.2:
Phase I Habitat Map

0 0.25 0.5
Kilometres
SCALE: 1:14,000 @ A3

REV 03

Document Path: C:\GIS\Elve_Ecology\Mount_main\MXD\P662711_A3_RSKECO02_Phase1HabitatSurvey.mxd

339000 340000 341000

651000 650000

Legend:

- Project area
- Proposed turbine layout
- Calcicolous grassland
- Calcifugous grassland & montane communities
- Calcifugous grassland & montane communities - mosaic
- Heath
- Heath - mosaic
- Mesotrophic grassland
- Mesotrophic grassland - mosaic
- Mire
- Mire - mosaic
- Woodland & scrub - including Non-NVC plantation woodland
- Non-NVC

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright and database right 0100031673 [2020]

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

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

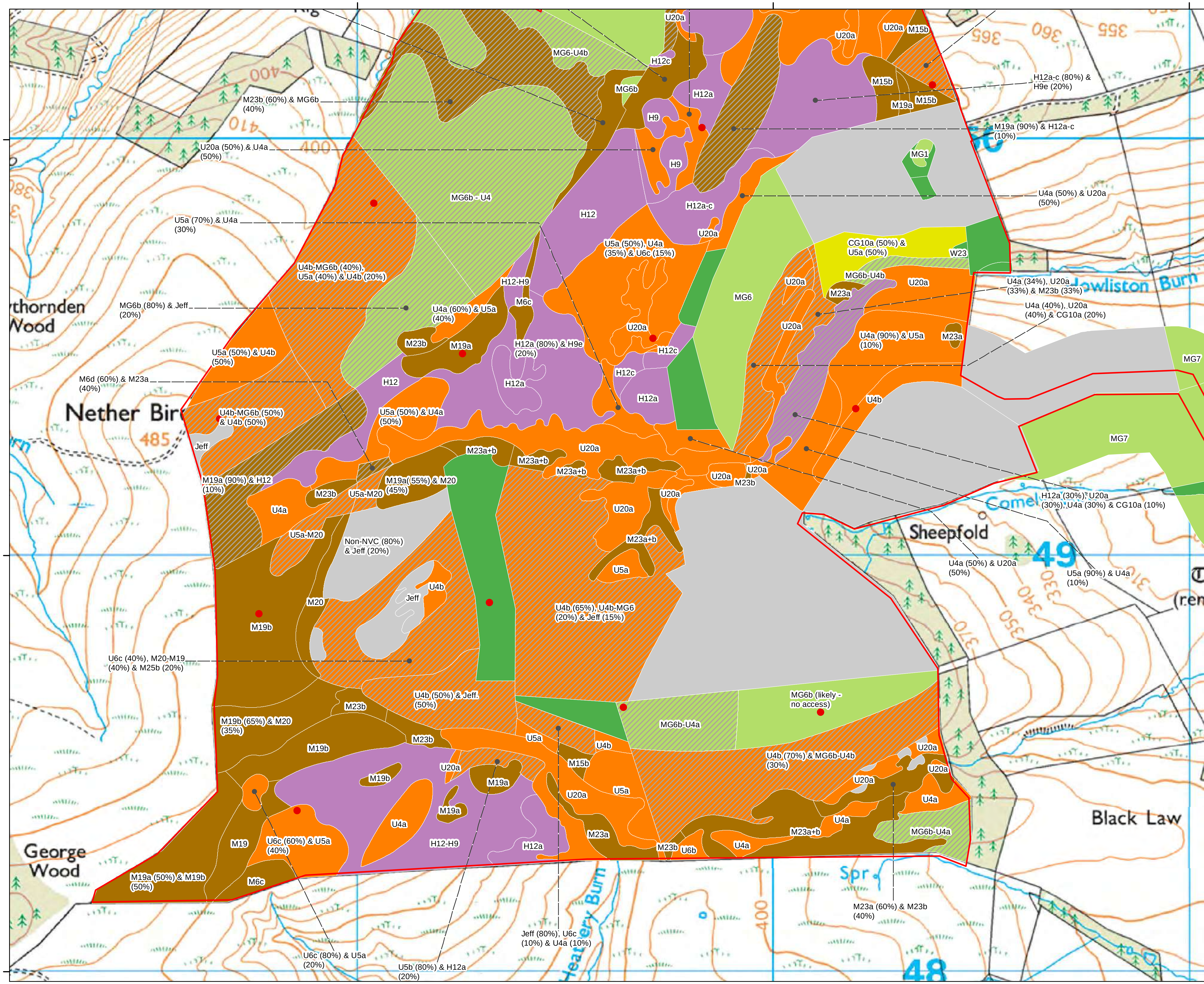
Greystone Knowe Wind Farm

TITLE:
Figure 4.3a:
National Vegetation Classification Map

0 0.15 0.3
Kilometres
SCALE: 1:8,500 @ A3

REV 03

Document Path: C:\GIS\Etive_Ecology\Mount_main\MXD\P662711_A3_RSKECO03_NVCSurvey.mxd


339000
340000
341000
650000
649000
648000
U20a
MG6-U4b
H12c
MG6b
M23b (60%) & MG6b (40%)
H9
H12a
M15b
M19a
M15b
H12a-c (80%) & H9e (20%)
M19a (90%) & H12a-c (10%)
U20a (50%) & U4a (50%)
H9
MG1
MG6b - U4
H12a-c
U4a (50%) & U20a (50%)
U5a (70%) & U4a (30%)
H12
U20a
U5a (50%), U4a (35%) & U6c (15%)
CG10a (50%) & U5a (50%)
W23
U4b-MG6b (40%), U5a (40%) & U4b (20%)
H12-H9
MG6b-U4b
U20a
U20a
Howliston Burn
U4a (34%), U20a (33%) & M23b (33%)
MG6b (80%) & Jeff (20%)
M6c
U4a (60%) & U5a (40%)
MG6
M23a
U4a (40%), U20a (40%) & CG10a (20%)
Hawthornden Wood
U20a
U20a
U4a (90%) & U5a (10%)
M23a
M23b
M19a
H12a (80%) & H9e (20%)
H12c
U5a (50%) & U4b (50%)
MG7
M6d (60%) & M23a (40%)
H12
H12a
H12c
H12a
Nether Birn
U4b-MG6b (50%) & U4b (50%)
U5a (50%) & U4a (50%)
U4b
485
Jeff
M23a+b
M23a+b
U20a
MG7
M23a+b
M23a+b
M19a (90%) & H12 (10%)
M19a(55%) & M20 (45%)
U20a
U20a
M23b
M23b
U5a-M20
U20a
H12a (30%), U20a (30%), U4a (30%) & CG10a (10%)
U4a
U20a
Comel
U5a-M20
M23a+b
Sheepfold
Non-NVC (80%) & Jeff (20%)
49
U5a
U4a (50%) & U20a (50%)
U5a (90%) & U4a (10%)
U4b
Jeff
M20
U4b (65%), U4b-MG6 (20%) & Jeff (15%)
M19b
U6c (40%), M20-M19 (40%) & M25b (20%)
U4b (50%) & Jeff. (50%)
MG6b (likely - no access)
M23b
M19b (65%) & M20 (35%)
MG6b-U4a
M23b
U5a
M19b
U4b
M15b
U4b (70%) & MG6b-U4b (30%)
U20a
U20a
M19b
U20a
M19a
U20a
U20a
U5a
U4a
M19a
U4a
Black Law
U4a
M23a
M23a+b
MG6b-U4a
M19
U6c (60%) & U5a (40%)
H12-H9
H12a
M23b
U6b
U4a
George Wood
M19a (50%) & M19b (50%)
M6c
M23a (60%) & M23b (40%)
Jeff (80%), U6c (10%) & U4a (10%)
U6c (80%) & U5a (20%)
U5b (80%) & H12a (20%)
48

Legend:

- Project area
- Proposed turbine layout
- Calcicolous grassland
- Calcifugous grassland & montane communities
- Calcifugous grassland & montane communities - mosaic
- Heath
- Heath - mosaic
- Mesotrophic grassland
- Mesotrophic grassland - mosaic
- Mire
- Mire - mosaic
- Woodland & scrub - including Non-NVC plantation woodland
- Non-NVC

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright and database right 0100031673 [2020]

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

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

Greystone Knowe Wind Farm

RSK
Coriolis Energy

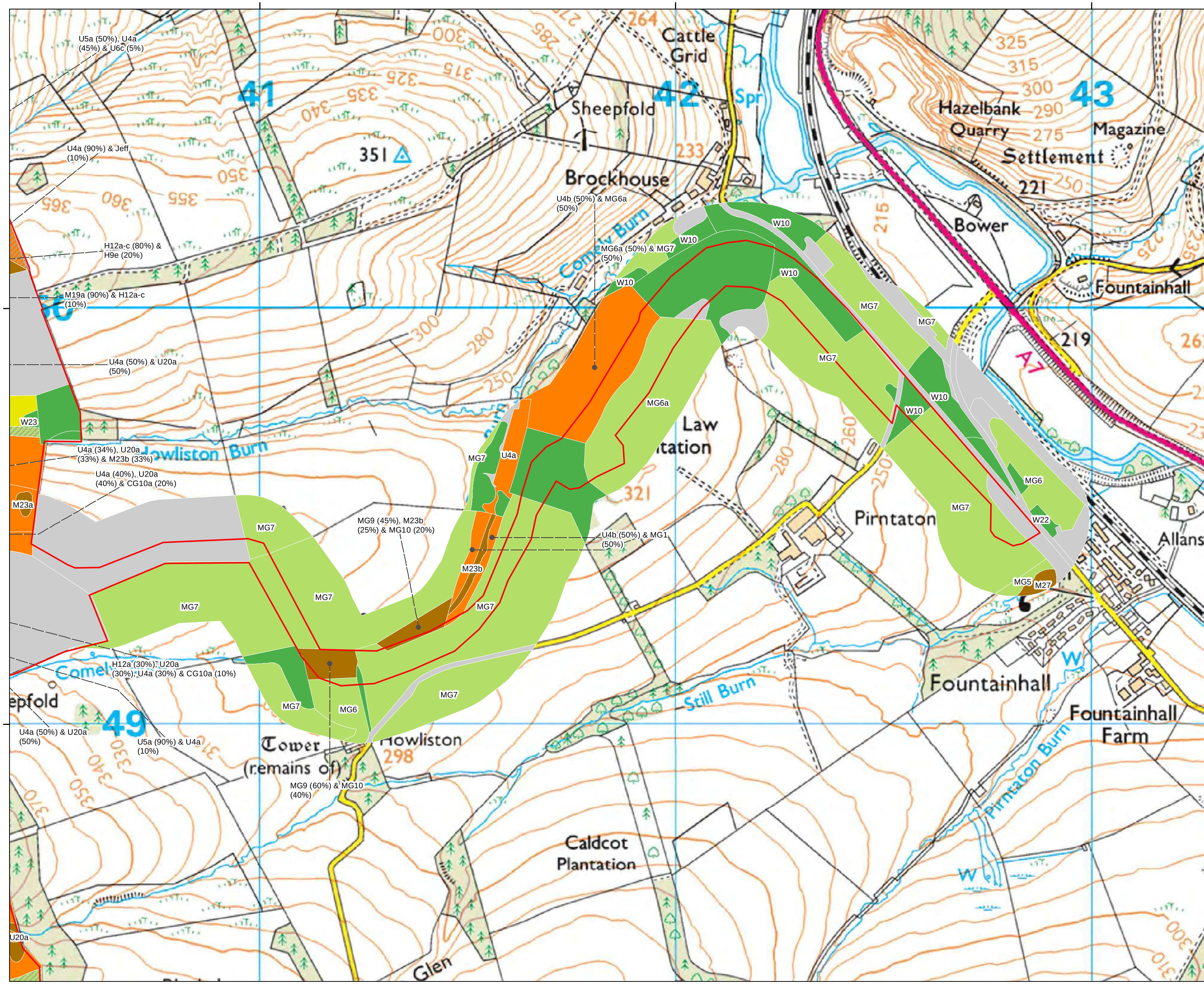
TITLE:
Figure 4.3b:
National Vegetation Classification Map

0 0.15 0.3
Kilometres
SCALE: 1:8,500 @ A3

N W E S

REV 03

Document Path: C:\GIS\Etive_Ecology\Mount_main\MXD\P662711_A3_RSKECO03_NVCSurvey.mxd



Legend:

- Project area
- Proposed turbine layout
- Calcicolous grassland
- Calcifugous grassland & montane communities
- Calcifugous grassland & montane communities - mosaic
- Heath
- Heath - mosaic
- Mesotrophic grassland
- Mesotrophic grassland - mosaic
- Mire
- Mire - mosaic
- Woodland & scrub - including Non-NVC plantation woodland
- Non-NVC

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright and database right 0100031673 [2020]

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

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

Greystone Knowe Wind Farm

RSK Coriolis Energy

TITLE: Figure 4.3c: National Vegetation Classification Map

0 0.15 0.3
Kilometres
SCALE: 1:8,500 @ A3

REV 03

Document Path: C:\GIS\Etive_Ecology\Mount_main\MXD\P662711_A3_RSKECO03_NVCSurvey.mxd

339000 340000 341000 342000 343000

651000 650000 649000 648000

Legend:

- Project area
- Proposed turbine layout

Protected Species Survey Findings

- Bats
- Bird
- Mammal
- Otter
- Squirrel
- Water vole

Notes:
This map contains data from the following sources:
Ordnance Survey data © Crown copyright
and database right 0100031673 [2020]

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

Target Notes:

[1] - Potential water vole habitat
[2] - Tree with bat roost potential
[3] - Tree with bat roost potential
[4] - Tree with bat roost potential
[5] - Trees with bat roost potential
[6] - Squirrel – chewed cones.
[7] - Squirrel – chewed cones.
[8] - Squirrel – chewed cones.
[9] - Squirrel - drey
[10] - Squirrel – chewed cones
[11] - Trees with bat roost potential
[12] - Squirrel – potential drey
[13] - Squirrel – potential drey
[15] - Squirrel – potential drey
[16] - Bird's nest
[18] - Squirrel – chewed cones
[19] - Otter spraint
[20] - Squirrel – chewed cones
[23] - Squirrel – chewed cones
[24] - Mammal hole
[25] - Mammal holes
[26] - Mammal holes
[29] - Bird's nest
[30] - Otter – spraint and prints

Rev	Date	Description	Drn	Chk	App
03	14/05/2020	Base Map Update	MP	MW	MW
01	21/04/2020	First Draft	MP	MW	MW

Greystone Knowe Wind Farm

TITLE:
Figure 4.4:
Protected Species Survey Findings

0 0.25 0.5
Kilometres
SCALE: 1:14,000 @ A3

REV 03

Document Path: C:\GIS\Etive_Ecology\Mount_main\MXD\P662711_A3_RSKECO04_ProtectedSpeciesSurvey.mxd

337000 338000 339000 340000 341000 342000 343000

652000 651000 650000 649000 648000 647000

Legend:

- Turbine Locations
- Peat Probing Locations
- Project Area
- Unsurveyed Area

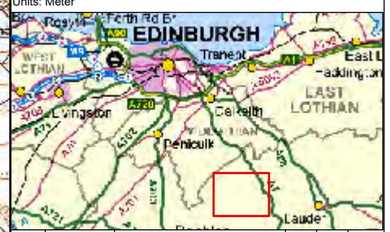
Interpolated Peat Depth (m)

- ≤ 0.25
- 0.25 - 0.49
- 0.50 - 0.99
- ≥ 1.0

Carbon and Peatland 2016

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5

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



Rev	Date	Description	Drn	Chk	App
01					
00	12/05/2020	First Draft	CM		

Greystone Knowe Wind Farm

RSK

TITLE:

Figure 7.1: Preliminary Peat Depth Survey

0 0.25 0.5 0.75
Kilometres
SCALE: 1:20,000 @ A3

N W E S

REV 01

Document Path: C:\Users\Cmcguire\OneDrive - RSK Group PLC\Documents\655061 Greystone\GIS\Greystone Map\Greystone Map.aprx