Harestanes South Windfarm Extension

Scoping Report

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SCOTTISHPOWER RENEWABLES

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Glossary of Terms and Abbreviations

Term or Abbreviation	Explanation
AADF	Annual average daily flow
AOD	Above Ordnance Datum
AWI	Ancient Woodland Inventory
BGS	British Geological Survey
Borrow pit	An area used to excavate to obtain material for use in construction
BPM	Best Practicable Means
CCTV	Close Circuit Television
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecological and Environmental Management
CIRIA	Construction Industry Research and Information Association
ClfA	Chartered Institute for Archaeologists
CLVIA	Cumulative Landscape and Visual Impact Assessment
CMS	Construction Method Statement
CNS	Communication, Navigation and Surveillance
CTMP	Construction Traffic Management Plan
DfT	Department for Transport
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EIA Report	The report which presents the findings of an Environmental Impact Assessment
EM	Electromagnetic
Embedded mitigation	Mitigation which is inherently included into the design of a project
ESDAL	Electronic service delivery for abnormal loads
EU	European Union
FLS	Forestry and Land Scotland
GIS	Geographical Information Systems
GVA	Gross Value Added
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HES	Historic Environment Scotland
HGV	Heavy Goods Vehicle
HSA	Habitat Suitability Assessment
IEA	Institute of Environment Assessment
IEMA	Institute of Environmental Management and Assessment
IOA	Institute of Acoustics
LCT	Landscape Character Type
LGV	Light Goods Vehicle
LMP	Land Management Plan
LNR	Local Nature Reserve

Term or Abbreviation	Explanation
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MOD	Ministry of Defence
NATS	National Air Traffic Services
NNR	National Nature Reserve
NOMIS	National Online Manpower Information System
NVC	National Vegetation Classification
ONS	Office of National Statistics
Operational Harestanes Windfarm	The existing and operational Harestanes Windfarm
POE	Ports of Entry
PPA	Power Performance Assessment
Proposed Development	The aspects of the Harestanes South Windfarm Extension for which permission is sought to construct and operate
ProW	Public Right of Way
PSR	Primary Surveillance Radar
PSRA	Peat Slide Risk Assessment
PWS	Private Water Supply
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SEPA	Scottish Environmental Protection Agency
SF	Scottish Forestry
Site Boundary	The extent of the area relating to the application
SNH	Scottish Natural Heritage
SNRHE	Scottish National Record for the Historic Environment
SPA	Special Protection Areas
SPMP	Soil and Peat Management Plan
SSSI	Site of Special Scientific Interest
Study Area	The area for which the respective assessment or study is concerned
Survey Area	The area relating to the respective survey
The Applicant	ScottishPower Renewables, who is submitting the application for the proposed Harestanes South Windfarm Extension
The Site	The area within the Site Boundary for which the Proposed Development will be contained
TV	Television
VP	Vantage Point
WFD	Water Framework Directive
ZTV	Zone of Theoretical Visibility

Executive Summary

ScottishPower Renewables UK Limited, trading as ScottishPower Renewables, intends to apply to the Scottish Government Energy Consents Unit for consent under Section 36 of the Electricity Act 1989 to develop an extension to the operational Harestanes Windfarm on land immediately adjacent to the south (the Site). The Site is located approximately 13 kilometres north of Dumfries, in Dumfries and Galloway and is shown in Figure 1.1 Site Location. It is likely that a request will also be made for a direction to be issued that Planning Permission be deemed to be granted.

Harestanes South Windfarm Extension (the Proposed Development) is an extension to the operational Harestanes Windfarm which consists of 68 wind turbines and has an electricity generating output of 136 megawatt. It has been operational since 2014.

The Proposed Development is anticipated to comprise of up to 15 turbines with tip heights of up to 200 metres with associated infrastructure, including the potential for co-located technologies. A preliminary layout of the turbine locations are shown on Figure 2.3 Preliminary Turbine Layout

The Development will constitute a Schedule 2 development as provided by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the EIA Regulations), and ScottishPower Renewables will submit an Environmental Impact Assessment Report (EIA Report) along with the application for consent. As per Regulation 12 of the EIA Regulations, ScottishPower Renewables is seeking to confirm, with the Scottish Government Energy Consents Unit and key consultees, the scope of the required assessment which is to be provided in the EIA Report, i.e. a “Scoping Opinion”.

This document has been prepared following a number of preliminary exercises including desk-based data collection and review of the data gathered during field surveys undertaken for the Operational Harestanes Windfarm. This document summarises the preliminary work undertaken to date and, in line with the EIA Regulations, aims to focus the assessment solely on those effects likely to be assessed as significant and identify those topics and / or receptors which can be scoped out as the effects are not likely to be significant.

Section 14 of this report provides a summary of effects that are deemed to be not significant and it is proposed will not be considered further within the EIA Report for the Development. The evidence, on which these decisions have been based, is described within each technical section of this document.

1 Introduction

1.1 The Proposal

1. ScottishPower Renewables UK Limited (the Applicant) is proposing to submit an application to the Scottish Ministers under Section 36 of the Electricity Act 1989[1] to construct and operate an extension to the operational Harestanes Windfarm, located approximately 13 kilometres (km) north of Dumfries, in Dumfries and Galloway (hereafter referred to as 'the Proposed Development'); see Figure 1.1 Site Location. It is likely that a request will also be made for a direction to be issued that Planning Permission be deemed to be granted.

2. The Proposed Development comprises of an extension of up to 15 turbines with a maximum height to blade tip of 200 metres (m) and ancillary infrastructure. Access to the extension site and grid connection will be made via the operational Harestanes Windfarm site.

1.2 Need for EIA

3. The Proposed Development falls within Schedule 2 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[2] (the EIA Regulations) and as such requires the submission of an Environmental Impact Assessment (EIA).

1.3 Purpose of Scoping Report

4. The Applicant is seeking confirmation of the scope of assessments to be included in the EIA from the Scottish Ministers and key consultees by requesting a Scoping Opinion under Schedule 12 of the EIA Regulations. This Scoping Report provides the following information to inform the Scoping Opinion, as stated in the EIA Regulations:

    1. a description of the location of the development, including a plan sufficient to identify the land;
    2. a brief description of the nature and purpose of the development and its likely significant effects on the environment; and
    3. such other information or representations as the developer may wish to provide or make.

5. The aim of the scoping process is to identify key environmental issues at an early stage, to ensure that the scope of the EIA is sufficient to assess the elements which have the potential to cause significant environmental effects. Equally, the scoping process is intended to ensure that the EIA is proportionate and therefore seeks to confirm the aspects that can be scoped out of the assessment.

6. As a key form of early engagement, this Scoping Report also includes questions to consultees to promote positive, focussed early consultation in the EIA process.

1.4 Assumptions and Limitations

7. This Scoping Report is based on environmental and design information available at the point of authorship, including 3rd party data. Assumptions specific to an environmental topic are stated in the relevant section below.

8. Any assumptions or limitations that remain as the EIA concludes will be stated in the EIA Report.

2 Project Description

2.1 Purpose of the Development

9. Onshore windfarm developments are viewed as key contributors to achieving the UK Government's renewable energy targets and the drive to reduce UK carbon emissions in line with current targets. The need for such development is underpinned by the Government's plans to restrict the use of all coal-fired power stations by 2023 and to cease operation by

[1] The Electricity Act, 1989. HM Government. Available at: http://www.legislation.gov.uk/ukpga/1989/29/contents
[2] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. HM Government. Available at: http://www.legislation.gov.uk/ssi/2017/101/contents/made

2025, resulting in the need for over a quarter of the UK's energy generation to be replaced in this period. The UK's climate change ambitions are amongst the highest in Europe and require an 80% reduction in carbon dioxide emissions by 2050.

10. By 2050 we are also likely to use considerably more electricity than we do today. This is driven by trends such as the growth in electric vehicle ownership, which has rapidly increased and is set to continue rising with the abolition of new diesel and petrol cars by 2040. In 2019, the Scottish Government was the first government in the world to formally declare a climate emergency. As part of the plan to address this, the Scottish Government has an ambitious energy strategy and has set targets to generate the equivalent of 100% of Scotland's electricity demand and 11% of non-electrical heat demand to be generated from renewable sources by 2020[3]. Furthermore, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 commits the Scottish Government to achieving 'net zero' emissions by 2045. The interim targets intensify the need to increase the reduction in harmful emissions. This is reflected in the reductions that have to be achieved within the current decade. The UK Energy Roadmap[4] and The UK Low Carbon Transition Plan[5] highlights onshore wind as a key contributor to achieving the UK Government's renewable energy targets and transition to a low carbon energy system. Onshore wind is also the cheapest form of low carbon electricity generation in the UK[6] and is shown to have local and national economic benefits; over the lifetime of SPR's eight operational onshore windfarms commissioned in 2016-2017 in south-west Scotland[7], £1,276 million gross value the UK and £297 million local value will be added[8].

2.2 Site Description

11. The area within the Site Boundary, hereafter referred to as 'the Site', is located in Dumfries and Galloway, within the southern extent of the Forest of Ae; immediately north of Ae and adjacent to the operational Harestanes Windfarm, as illustrated in Figure 1.1 Site Location and Figure 2.1 Environmental Context. The surrounding area is rural with land largely being used for electricity generation, commercial forestry and agriculture. The nearest town is Dumfries, approximately 13km south. The Site is within the administrative area of Dumfries and Galloway Council. Harestanes Windfarm, operational since 2014, consists of 68 turbines with an electricity generating output of 136MW.

12. The Site is an existing commercial forest owned and managed by Forestry and Land Scotland (FLS) and is predominantly covered by Sitka spruce plantations. The topography rises to a high point of 344m at Knockespen with further high points including Wood Hill to the south and Brownmoor to the north of the Site, as illustrated in Figure 2.2 Local Environmental Constraints. The western extent of the Site is characterised by a steep valley through which the Water of Ae runs north to south, whereas the eastern extent of the Site has a gentle sloping relief to a low of approximately 210m. There are several burns throughout the Site, which drain into the Water of Ae.

13. The Forest of Ae hosts one of the 7Stanes mountain biking trail centres and there are two trails which cross into the southwest of the Site. There are multiple other forest tracks throughout the Site, and a section of the Romans and Reivers long-distance walking path.

14. The main transport link in the area of the Site is the A701, which runs north to south approximately 1km to the southeast of the Site and links to the A74(M) at Beattock approximately 11km north of the Site. There are also minor roads from the A701 westwards through to Ae and beyond.

15. Ae is the closest group of properties. Beyond this around the south of the Site are several hamlets, dwellings and farmsteads. Parkgate is approximately 1km southeast of the Site and is the only other group of properties within approximately 2km of the Site, as shown in Figure 1.1 Site Location.

16. In addition to the operational Harestanes Windfarm, there are two other operational windfarms nearby; Minnygap adjacent to the north and Dalswinton approximately 2.7km to the southwest, as shown on Figure 5.4 Cumulative Windfarms.

[3] Annual Energy Statement 2019. Scottish Government. Available at: https://www.gov.scot/publications/annual-energy-statement-2019/pages/3/
[4] The UK Renewable Energy Roadmap, HM Government. 2013. Available at: https://www.gov.uk/government/collections/uk-renewable-energy-roadmap
5 The UK Low Carbon Transition Plan, HM Government. 2009. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228752/9780108508394.pdf
6 The Power of Onshore Wind. BVG Associates. June 2018. Available at: https://bvgassociates.com/the-power-of-onshore-wind/
[7] Black Law Extension (a), Black Law Extension (b), Dersalloch, Ewe Hill 1, Ewe Hill 2, Glen App, Hare Hill Extension, Killgallioch
[8] Economic benefits from onshore wind farms. BVG Associates. 2017.

2.3 Proposed Development

2.3.1 Design Components

17. The Proposed Development will comprise of up to 15 turbines each having a height of up to 200m to blade tip and rotor diameter of around 150m. A preliminary turbine layout is shown in Figure 2.3 Preliminary Turbine Layout to illustrate how this number of wind turbines may be accommodated on the Site and to inform the scoping process. The Site Boundary Figure 1.1 is the boundary within which the Proposed Development is being designed and may change to take account of connection to the operational Harestanes Windfarm to enable grid connection and site access.

18. In addition to the turbines, the Proposed Development is anticipated to also include the following ancillary components and related infrastructure:

- crane hardstandings adjacent to each turbine;
- power cables linking the turbines laid in trenches underground, including cable markers;
- control building including parking and a small storage compound;
- permanent and temporary power performance assessment (PPA) anemometry masts;
- new and upgrade of existing access tracks, passing places and turning circles;
- communication mast(s);
- Health and Safety and other directional signage;
- close circuit television (CCTV) mast(s);
- borrow pits; and
- temporary construction compound.

19. A key-holed approach to siting within the forest is being proposed, thus seeking to retain as much forestry as possible.

2.3.2 Embedded Mitigation

20. Embedded mitigation relates to measures inherent in the design of the Proposed Development. Throughout the iterative design process, environmental constraints will be one of the key factors which shape the design of the Proposed Development. As baseline information is collected and potential impacts identified, these will be factored into design workshops in parallel with other engineering and technical constraints. Therefore, mitigation in the form of design to avoid or reduce environmental impacts will be inherent from the outset.

21. For example, by locating the Proposed Development adjacent to the operational Harestanes Windfarm, existing infrastructure such as access tracks and substation will be utilised, reducing the need to construct new features.

2.3.3 Construction

22. It is expected that the construction period of the Proposed Development will be up to 18 months, planned to commence in 2022. Construction site restoration will be programmed and carried out to allow restoration of disturbed areas progressively and as early as possible during the construction period.

2.3.4 Operation and Maintenance

23. There is no proposal to limit the lifetime of the Proposed Development. Therefore, the assessment of potential effects on all environmental aspects considers the operational phase of the Proposed Development without time limitations. Should decommissioning of any of the Proposed Development be required, e.g. as a result of failure of a wind turbine beyond economic repair, any effects would be of lesser magnitude than those resulting from the construction phase of the Proposed Development and, as such, effects associated with the decommissioning phase have been scoped out of further assessment. Should consent be granted, it is anticipated that there would be a condition which would deal with the requirement to remove turbines if they become non-operational for a defined period of time.

2.3.5 Environmental Management

24. Through the identification of potential impacts, the EIA Report will set out measures to avoid, prevent, reduce or where necessary offset significant adverse effects. Where appropriate, these measures will also be accompanied by monitoring commitments intended to monitor their effectiveness. The EIA Report will be accompanied by an Outline Construction Environment Management Plan (CEMP) which will include a Schedule of Mitigation, which will specify measures that would

be implemented during construction to protect the environment. The guidance document 'Good Practice during Windfarm Construction, 2019[9]' will inform the assessment.

3 Approach to EIA

3.1 General Approach

25. EIA and reporting will be undertaken in line with the EIA Regulations and current best practice guidance including:

- Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guides to Delivering Quality Development (2016), Shaping Quality Development (2015), and Delivering Proportionate EIA (2017)[10].
- Scottish Natural Heritage (SNH), 2018 Environmental Impact Assessment Handbook[11].

26. The results of the EIA will be presented in an EIA Report, which will contain the information specified in Schedule 4 of the EIA Regulations. It will be undertaken by 'competent experts' with evidence of the competence of those responsible for the preparation of the EIA set out in the EIA Report.

27. A detailed overview of the guidance and methodology adopted for each technical study is provided within the respective technical chapters of this EIA Scoping Report (Sections 5-13).

3.2 Consultation Strategy

28. Stakeholder consultation is an important component of the EIA process. To inform the EIA, consultation will be undertaken with statutory and non-statutory consultees to identify relevant baseline information and key issues or concerns that these consultees wish to raise. It is further envisaged that consultation will continue throughout the EIA process, for example to discuss proposed mitigation and/or environmental enhancement measures.

29. Public consultation is an important element of the EIA and the overall planning process and can take many different forms. The Applicant will seek to use the most practical and effective form possible and will consider the following options:

- public information days, held in communities near to the Site;
- mail drops, posting information leaflets to each address near to the Site;
- providing a dedicated webpage for the Proposed Development which would host information;
- providing a mailbox and email address for members of the public to provide comment or ask questions; and
- phone meetings with community councils to get feedback on the proposal.

3.3 Baseline Conditions

30. Environmental effects as a result of the Proposed Development will be described in the EIA Report in relation to the extent of changes to the existing baseline environment. The baseline conditions are the existing environmental characteristics and conditions. This information will be obtained via a combination of desk-top studies and field surveys.

31. In accordance with the EIA Regulations the effects of climate change will be considered, where relevant, in relation to the current baseline, along with future baseline scenarios.

3.4 Assessment of Effects

32. The proposed assessment methodologies for each topic are described in sections 5-13 of this Scoping Report and are based upon the requirements of the EIA Regulations, relevant current industry guidance and professional judgement and experience. However, each assessment will comprise the following key steps:

[9] Good Practice during Wind Farm Construction (2019). Available at: https://www.nature.scot/guidance-good-practice-during-wind-farm-construction
[10] IEMA Environmental Impact Assessment Guide to Shaping Quality Development. IEMA. 2015. Available at: https://www.iema.net/assets/uploads/iema_guidance_documents_eia_guide_to_shaping_quality_development_v7.pdf
[11] Environmental Impact Assessment Handbook. Scottish Natural Heritage (SNH). 2018. Available at: https://www.nature.scot/sites/default/files/2018-05/Publication%202018%20-%20Environmental%20Impact%20Assessment%20Handbook%20V5.pdf

1. Determine the sensitive receptors to be considered and establish their level of sensitivity.
2. Identify the potential effects the Proposed Development and what the magnitude of change would be.
3. Consideration of whether the potential impact could be avoided, reduced, mitigated, or offset.
4. Assessment of the significance of residual effects following consideration of any mitigation, based upon the **sensitivity of receptor** and the **magnitude of impact**. A matrix approach to the assignment of the **level of significance** will be followed and defined in the EIA Report.

3.5 Mitigation Measures

33. Further to the embedded mitigation described in Section 2.3.2, where the EIA identifies likely significant adverse environmental impacts, mitigation measures will be proposed where practicable to avoid, prevent, reduce or offset the associated effects. Such measures would be implemented during construction and/or operation of the Proposed Development. Each technical chapter will detail the measures proposed to mitigate identified significant adverse effects. A schedule of all the mitigation commitments documented in the EIA Report will be provided for ease of reference.

34. In addition, enhancement measures may be incorporated into the design to maximise environmental benefits, where possible.

3.6 Cumulative Effects

35. The EIA Report will include an assessment of cumulative effects in line with the EIA Regulations. It will consider two types of cumulative effects:

- In-combination effects: The combined effect of the Proposed Development together with other reasonably foreseeable developments on a common receptor.
- Effects Interactions: The combined or synergistic effects on a particular receptor which may collectively cause a more significant effect than individually. A theoretical example is the culmination of disturbance from dust, noise, vibration, artificial light, human presence and visual intrusion on sensitive fauna (e.g. certain bat species) adjacent to a construction site.

36. The assessment would be undertaken in line with current guidance including SNH's Guidance on Assessing the cumulative impact of onshore wind energy developments[12] and other applicable current guidance as appropriate.

37. Development proposals that should be included in a cumulative assessment will be agreed with the Energy Consents Unit in conjunction with key stakeholders through the Scoping Opinion and subsequent stakeholder consultation as necessary. The requirements will differ for different technical assessments and may include existing as well as proposed windfarm developments. For other forms of development, it is proposed that they are limited to developments which are classified as EIA development and which have planning applications submitted, approved or are under construction, and are located within a 10km radius of the site.

3.7 Scoping the Assessment

38. Whilst this EIA Scoping Report seeks to establish the overall framework for the EIA in relation to the technical topics and associated effects, iterative re-scoping will be undertaken through the EIA process and consulted on, as required.

3.8 Consideration of Alternatives

39. The EIA Report will present the main alternatives considered relevant to the Proposed Development including aspects such the location, nature, scale and design principles/parameters.

40. Consideration of potential alternatives will be undertaken throughout the iterative design process, with early consideration ensuring that risks and challenges at a later stage are minimised and potential environmental effects avoided where possible.

[12] Guidance-Assessing the cumulative impact of onshore wind energy developments (2012). SNH. Available at: https://www.nature.scot/guidance-assessing-cumulative-impact-onshore-wind-energy-developments

4 Planning Policy Context

41. A Planning Policy section is not required within the EIA Report by the EIA Regulations, as the purpose of an EIA is not to assess compliance with the development plan policy, but to ensure the decision maker, in this case the Scottish Ministers, when deciding to grant consent for a project, does so in the full knowledge of likely significant effects.

42. A Planning and Policy Statement will accompany the Section 36 application and will include an assessment of the Proposed Development's compliance with National Planning and Energy Policy and the Development Plan.

43. Local and national policy, where relevant to the assessment of likely significant effects, will be set out in the technical chapters of the EIA Report. For example, where policy identifies that an environmental aspect, such as a particular habitat or landscape component, is of particular value, this will be taken into account, typically in consideration of its sensitivity to change, when assessing the significance of effects. This is different from assessing the compliance of the Proposed Development with policies that set out how decisions on development consent should be made.

44. The information provided in the EIA Report will demonstrate how the requirements of Schedule 9 of the Electricity Act have been met and this will be reported in the Planning and Policy Statement.

5 Landscape and Visual

5.1 Consultation

45. At this stage, no consultation on Landscape and Visual matters has been undertaken with stakeholders. Through the EIA, consultation will be undertaken with SNH and Dumfries and Galloway Council's Landscape Officers.

5.2 Baseline Conditions

46. The Site is located within the south-eastern section of the Forest of Ae, which forms part of an upland plateau landscape with a series of undulating hills. The Site is located to the east of Green Hill and as shown on Figure 2.1 Local Environmental Constraints, encompasses Brownamoor Hill at 347m Above Ordnance Datum (AOD), Wood Hill at 298m AOD, Pummro Fell at 393m AOD, and Kirkland Hill at 368m AOD. Within the Site there are substantial topographic changes with a steep west-facing slope to the Water of Ae along its western boundary and the small valleys of Glenkiln Burn and Clachanbirnie Burn in the centre of the Site. The Site is largely covered by coniferous forestry with numerous forestry tracks and trails and a communications mast located on the summit of Pumro Fell.

47. The Proposed Development would form an extension to the operational Harestanes Windfarm and lies immediately to the south and southeast of the most southern turbines of the operational Harestanes Windfarm. The operational Dalswinton Windfarm is located to the west and the operational Minnygap Windfarm is located to the northeast.

48. The Site lies largely within the Foothills with Forest landscape character type (LCT) no.176 as illustrated on Figure 5.1 and defined by the SNH National Landscape Character Assessment (2019)[13] which will be used as a baseline character document for the Landscape and Visual Impact Assessment (LVIA). The Site is generally typical of the characteristics of this LCT which include distinctive ridges and landmark summits, blankets of forest over undulating hills, and a changing landscape with areas of large and medium scale forestry operations and windfarm development.

49. There are three other LCTs within the Site Boundary:

- LCT 175 - Foothills (along the eastern side of the Site)
- LCT 172 - Upland Fringe (southwestern and eastern edge of the Site)
- LCT 163 - Middle Dale (Site access area off the A701)

[13] National Landscape Character Types, SNH (2019)

50. There are no international, national or local landscape designations within the Site Boundary. Thornhill Uplands and Torthorwald Regional Scenic Areas lie within 5km to the northwest and south respectively. Talla-Hart Fell Wild Land Area lies 18.5km northeast of the Site. Figure 5.2 illustrates the designations within the Study Area.

51. The Wind Energy Development: Development Management Considerations Appendix 'C' of the Dumfries & Galloway Wind Farm Landscape Capacity Study (adopted 2017 with minor revisions February 2020)[14] examines the landscape character baseline across Dumfries and Galloway with regard to its sensitivity to different sizes of wind turbine development. The site falls within the Ae landscape unit of the Foothills with Forest (18A) character type, which has been assessed as having a medium landscape value and overall high sensitivity for very large turbine typology (identified as turbines of >150m to blade tip).

52. Ae is located approximately 1.75km to the southwest of the nearest proposed turbine. There are several isolated residential properties along the A701 and within 2km of the Site which will be included in the Residential Visual Amenity Assessment where relevant. Residents in the villages of Auldgirth and Thornhill are located circa 7.5km to the west and circa 10.3km to the northwest of the Site Boundary respectively. Dumfries is located circa 12.8km to the south of the Site and Moffat and Sanquhar are located circa 12.4km and 26.6km northeast and northwest respectively. Lockerbie and Annan are located circa 12.6km and 27.7km to the southeast of the Site respectively.

53. Key transport routes within the Study Area include the A701, A76, A75 and A74(M). There are several other roads within the Study Area ranging from small A and B roads to unclassified lanes. The Galloway Tourist Route follows the A75 through Dumfries and merges onto the A711 towards Dalbeattie where it broadly heads north along the A713. The Clyde Valley Tourist Route heads north from Crawford along the A702 towards Biggar, outside of the Study Area.

54. The Ae Forest 7stanes Mountain Bike Trails pass through the Site along its western boundary, and the Romans and Reivers long-distance path runs north to south through the western half of the Site. The Annandale Way is located circa 2.5km to the east of the Site. Views from summits such as Queensberry to the north of the Site and users of the Southern Upland Way which passes through the northern part of the Study Area will also need to be considered.

5.3 Sensitive Receptors

55. On review of the baseline information, the following key sensitivities will be considered in the LVIA and cumulatively:

- Thornhill Uplands Regional Scenic Area;
- Torthorwald Ridge Regional Scenic Area;
- Talla-Hart Fell Wild Land Area;
- Raehills, Drumlanrig, and Cowhill Tower Gardens and Designed Landscapes;
- 7stanes Mountain Bike Trails;
- Romans and Reivers long-distance walking path;
- Southern Upland Way;
- Queensberry summit;
- Ae;
- Residents within 2km of the proposed turbines; and
- Users of the A701.

5.4 Mitigation

56. The primary form of mitigation for landscape and visual effects is through the iterative design of the layout of the turbines and infrastructure. Landscape and visual considerations, including the location and appearance of the Proposed Development in relation to the existing windfarm baseline will play a major role in the design of the Proposed Development. The baseline analysis and initial field surveys will identify key potential sources of landscape and visual effects, which will inform the design process. This will include:

- the particular landform and landscape context of the Site;
- the existing landscape and visual baseline of the Study Area;
- potential effects on landscape and visual receptors;

[14] The Wind Energy Development: Development Management Considerations Appendix 'C' Dumfries & Galloway Wind Farm Landscape Capacity Study (adopted 2017 with minor revisions February 2020), Dumfries and Galloway Council.

- a range of environmental and technical constraints which limit the area within which turbines may be located; and
- national and local planning policy and guidance.

57. The design will be continually reconsidered as it develops, to prevent and reduce potential landscape and visual effects. A set of design objectives will be established based on best practice guidance, including the SNH publication Siting and Designing Windfarms in the Landscape[15]. Design development will be set out in detail in the design strategy that will form part of the EIA Report.

5.5 Likely Significant Effects

58. The construction and operation of the Proposed Development has the potential for significant effects on:

- landscape fabric caused by changes to the physical form of the landscape and its elements;
- landscape character caused by changes in the key characteristics and qualities of the landscape;
- designated landscapes caused by changes to their special qualities; and
- visual amenity which would be caused by changes in the appearance of the landscape.

5.6 Assessment Methodology

59. The LVIA will establish potential significant effects of the Proposed Development on the landscape resource and visual amenity, in accordance with 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' (Landscape Institute and IEMA, (2013) ('GLVIA3')[16]. Other sources of guidance and references, which will be used in the LVIA will be industry standards. The exact documents used will be set out in more detail in the EIA Report. Local planning policy and guidance will also be reviewed in the EIA.

60. A Zone of Theoretical Visibility (ZTV) plan will be used to inform the final Study Area and which landscape and visual receptors require consideration in the assessment, and which can be scoped out because they are unlikely to be significantly affected. While the design of the Proposed Development is subject to change, Figure 5.3 illustrates the ZTV for the preliminary turbine layout with a 200m blade tip height and 125m hub height, based on a 150m rotor diameter.

61. A preliminary Study Area of a 45km radius from the outermost turbines is proposed for the LVIA, as recommended in SNH guidance for turbines over 150m to blade tip[17]. Figure 5.3 illustrates that, due to the topography, potential visibility of the Proposed Development is largely within a 15km radius, becoming more scattered out to 30km, with a wider area of potential visibility over the Solway Firth in the south, beyond 45km. However, it is considered that the visibility in the Solway Firth area is likely to be much less due to the intervening landscape cover and built form such that any views of the Proposed Development will not be significant in this direction and at this distance.

62. As such, it is proposed that the assessment focusses on a Study Area of a 30km radius from the outermost turbines for effects upon landscape character, landscape designations, and visual amenity.

63. The LVIA will be supported by wirelines and photomontages from the agreed viewpoint locations. Key operational, consented and in-planning windfarms visible from each of the viewpoints will be shown on the wireframes (where turbine data is available). All visualisations will be produced in accordance with SNH Visual Representation of Windfarms Version 2.2[18]. Proposed forestry felling and ancillary elements will be illustrated on viewpoints within approximately 5km of the Proposed Development as it is considered that from more distant viewpoints these elements would be largely indiscernible within the wider view.

64. A list of proposed representative viewpoints to be included in the LVIA is presented in Table 5.3 and shown on Figure 5.3. These have been chosen based on knowledge of the area, previous feasibility study information and review of nearby wind farm submissions.

[15] Siting and Designing Wind Farms in the Landscape, Version 3a; SNH (2017)
[16] Guidelines for Landscape and Visual Impact Assessment: Third Edition' (Landscape Institute and IEMA, (2013)
[17] Visual Representation of Windfarms Version 2.2; SNH (2017);
[18] Visual Representation of Windfarms Version 2.2; SNH (2017);

Table 5.3: Proposed Viewpoints

Viewpoint No.	Name	Approximate Grid Reference	Distance from Site Boundary	Reason for Inclusion
1	Ae	298513, 589081	1.75km	Residential Receptors
2	A701 near Kirkland	303069, 589047	3.2km	Residential Receptors and sequential views
3	Windy Hill	296765, 592382	2.7km	Residential Receptors and sequential views
4	St Ann's (A701)	307145, 594034	3.8km	Sequential views and nearby residential receptors
5	A701 near Johnfield	300542, 585894	5.3km	Sequential views and nearby residential receptors
6	Loch Ettrick	294330, 593683	4.5km	Close views from the northwest
7	Queensberry	298905, 599733	4.8km	Popular high point
8	Ridding Wood	298477, 584118	5.0km	Residential views from the south
9	A76 Portrack	292986, 583127	8.5km	Road users and sequential views
10	A74 (M) (north of Lockerbie)	311980, 584860	10.8km	Road users
11	Romans and Reivers Route, Moffat	309453, 603050	10.6km	Footpath users
12	Dumfries Bypass	297925, 578199	11.0km	Road users and nearby residential receptors
13	Near Bishop Forest Hill	284205, 580359	17.1km	Framed valley views from the southwest
14	Devil's Beef Tub	306335, 612107	18.0km	Road users and nearby tourist viewpoint
15	Hart Fell	311375,613607	21.0km	Wild Land

5.6.1 Cumulative LVIA (CLVIA)

65. The assessment of cumulative effects will be an integral part of the LVIA given the Proposed Development is an extension to Harestanes Windfarm and in close proximity to several windfarms. The CLVIA will be carried out in accordance with SNH's Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012)[19]. The LVIA will consider the potential effects of the addition of the Proposed Development to the existing landscape against a baseline that includes existing windfarms and those under construction. The CLVIA will consider the potential additional effects of the Proposed Development against a baseline that includes consented but not yet built windfarms, windfarms that have undetermined planning applications, and any windfarm proposals that have been refused but are being appealed. Windfarm sites that are in scoping will only be included if they are in close proximity to the Site and have potential to create significant cumulative effects with the Proposed Development.

66. The pattern of operational, consented and in-planning windfarms within an initial 45km radius search area of the Proposed Development (as shown on Figure 5.4) illustrates that the Proposed Development would be within an existing small group of windfarms (Harestanes, Minnygap and Dalwinston), with an approximate 10km gap to the closest windfarm group in the north (Clyde Wind Farm), approximately 20km to the closest windfarm in the west (Wether Hill) and approximately 20km to the closest windfarm in the east (Crossdykes). Taking this into account and on review of the ZTV (Figure 5.1) it is proposed that the focus of the cumulative assessment should be on the effects with the immediately adjacent windfarms, and also sequential cumulative effects upon travellers and walkers along the main roads and long-distance paths with windfarms

[19] Assessing the Cumulative Impact of Onshore Wind Energy Developments; SNH (March 2012)

within a 45km Study Area. Table 5.4 provides a list of the cumulative sites within the Study Area that will be considered initially.

67. Following further analysis and based on final project layouts, the 45km radius Cumulative Study Area proposed may be refined further to identify the wind energy developments most likely to lead to cumulative significant effects with the Proposed Development. Turbines with a blade tip height of 50m or less and single turbine developments beyond 5km of the Site will not be considered as it is anticipated that these will be unlikely to contribute to any significant cumulative effects. The precise scope of the CLVIA and final list of wind energy developments to be included in the CLVIA will be agreed with consultees.

Table 5.4: Cumulative Sites within 45km

Wind Farm	Status	Approximate Distance and Direction from Site
Operational and Consented Windfarms		
Harestanes	Operational	0km
Minnygap	Operational	1.6km north
Dalswinton	Operational	2.5km west
Clyde	Operational	6.2km north
Lionhill	Consented	16.0km south
Crookedstane	Consented	19.0km south
Minsca	Operational	19.0km southeast
Crossdykes	Consented	19.8km east
Ewe Hill	Operational	21.0km southeast
Ewe Hill Phase 2	Consented	22.0km southeast
Whitelaw Brae	Consented	23.7km north
Solwaybank	Consented	25.0km southeast
Plascow	Operational	27.7km southwest
Wether Hill	Operational	28.0km west
Blackcraig	Operational	28.0km southwest
Mochrum Fell	Consented	28.5km southwest
Blackhill to Magheuchan	Consented	29.0km northwest
Whiteside Hill	Operational	28.6km northwest
Sanquhar	Consented	30.0km northwest
Middle Muir	Consented	32.0km north
Glenkerie Extension	Operational	32.6km northeast
Glenkerie	Operational	32.7km northeast
Hare Hill Extension	Consented	33.0km northwest
Andershaw	Consented	33.3km north
Hare Hill	Operational	35.0km northwest
Red Moss Hotel and Truck Stop	Consented	35.1km north
Kennoxhead	Consented	35.6km northwest
Glenmuckloch	Consented	35.8km northwest
Afton	Consented	36.0km northwest
Windy Standard Extension	Consented	36.5km northwest
Penbreck/Carmacoup Forest	Consented	36.8km northwest
Windy Standard	Operational	36.8km northwest
Kype Muir	Consented	38.5km northwest

Wind Farm	Status	Approximate Distance and Direction from Site
Hagshaw Hill Extension	Operational	40.0km northwest
Galawhistle	Consented	40.8km northwest
Poniel	Consented	42.2km northwest
Cumberhead	Consented	43.5km northwest
Torrs Hill	Operational	45.0km west
Windfarms in Planning (including at inquiry or appeal)		
Hartwood Hill	Planning	11.3km south
Douglas West Wind Farm	Planning	14.5km northwest
Collieston Hill	Planning	18.0km west
Milldown Wood	Planning	19.4km southwest
Barnbackle	Planning	19.5km southwest
Loch Urr	Planning	20.1km west
North Lowther Energy Initiative	Planning	20.5km northwest
Kissock and Breconside	Planning	22.3km southwest
Hopsrig	Planning	22.6km east
Fell	Planning	23.8km west
Loganhead	Planning	23.8km southeast
Euchanhead	Planning	24.0km northwest
Ulzieside	Planning	25.0km northwest
Doon Hill	Planning	26.3km southwest
Stroanschalloch	Planning	26.5km west
Faw Side	Planning	28.0km east
Margree	Planning	28.0km west
Mochrum Fell	Planning	28.6km southwest
Newbie	Planning	28.6km southeast
Marnnhoul	Planning	28.7km southwest
Barlay Hill	Planning	30.0km west
West scales	Planning	31.0km southeast
Banshinnie	Planning	31.0km southwest
Loch Hill	Planning	31.0km west
Priestgill	Planning	31.2km north
Longburn	Planning	31.7km west
Windy Hill	Planning	34.0km west
Hare Hill Extension	Planning	34.0km northwest
Shepherds Hill	Planning	35.0km west
Gelson	Planning	36.0km southwest
Quantans Hill	Planning	36.4km west
Lethans	Planning	36.4km northwest
Pencloe Wind Farm	Planning	39.0km northwest
Windy Standard III	Planning	40.0km northwest
South Kyle	Planning	41.5km northwest
Enoch Hill Windfarm	Planning	41.8km northwest
Windy Edge	Planning	43.1km east

Wind Farm	Status	Approximate Distance and Direction from Site
Dalquhandy	Planning	43.2km northwest
Barrel Law – new scheme	Planning	43.3km northeast
Broken Cross	Planning	44.5km northwest

5.6.2 Residential Visual Amenity Assessment (RVAA)

68. A detailed assessment of potential visual effects on residential properties within an approximately 2km Study Area (measured from the nearest proposed turbines) will be undertaken in accordance with the Landscape Institutes Residential Visual Amenity Assessment (RVAA) - Technical Guidance Note 2/19[20] and presented as a separate technical appendix. This will include the production of a ZTV for the 2km Study Area to identify properties with theoretical visibility of the Proposed Development, and an assessment based upon professional judgement, supported by fieldwork, photography, aerial imagery and wirelines. The RVAA will consider the primary orientation of the properties, distance and direction to the Proposed Development, intervening topography, proportion of available view occupied by turbines, and the baseline situation at the property.

69. Table 5.5 provides a list of those properties that lie within approximately 2km of the nearest turbine of the Scoping layout. A final list will be confirmed at design freeze.

70. Table 5.5: Residential properties within approximately 2km of the nearest turbine

Property / Group of Properties	Approx. distance and direction from nearest turbine
Lamphitt	1.3km south
Glenfine Farm	1.4km southwest
Glencorse	1.5km southwest
Group of properties north of the Water of Ae	1.6km south
Ae	1.5km south
Burnfoot	1.8km northwest
Larchview	1.9 km northwest
Wood Farm	2.0km south
Glenmaid	2.2km southwest
Grubhill	2.2km northwest

5.6.3 Lighting Assessment

71. As the Proposed Development's turbines are over 150m tall, they will be classed as en-route aviation obstacles and require lighting in accordance with Article 222 of the Air Navigation Order, as modified by the Civil Aviation Authority (CAA) Policy Statement on Lighting of Onshore Wind Turbine Generators in the United Kingdom with a Maximum Blade Tip Height At or In Excess of 150 m Above Ground Level (CAA, June 2017). The EIA will consider the landscape and visual implications of turbine lighting. It is important to note that the assessment will not be a technical lighting assessment based on quantitative measurements of light levels but will rely on the professional judgement of what the naked human eye can reasonably perceive in the context of the baseline situation with regard to existing sources of artificial lighting. This will be informed by the production of ZTVs of the proposed lighting heights and extent of lighting intensity. In addition to this, photomontages from viewpoints with photography taken at dusk or dawn, in line with SNH guidance[21], will be included.

72. To consider the potential effect on visual receptors who would be sensitive to views at night (and also as safe locations to obtain dusk/dawn photography) the following viewpoints are proposed:

[20] Residential Visual Amenity Assessment (RVAA) - Technical Guidance Note 2/19; Landscape Institute (2019)
[21] Visual Representation of Windfarms Version 2.2; SNH (2017);

- Viewpoint 1: Ae;
- Viewpoint 4: St Ann's (A701); and
- Viewpoint 10: A74 (M).

5.7 Issues Scoped Out

5.7.1 Landscape Character

73. All LCTs within the proposed Study Area that do not have any or very minimal potential visibility of the Proposed Development will be scoped out of the assessment. In addition, LCTs with potential visibility will be scoped out if a combination of distance and intervening landscape cover and built form (not included within the ZTV model) reduces the potential for any significant effects. This will be determined through site work and desk study and agreed with the consultees.

5.7.2 Landscape Designations

74. Due to the distance from the Proposed Development, minimal potential visibility illustrated on the ZTV (Figure 5.3) and also qualities which relate to aspects or views unrelated to the Site, the following landscape designations are proposed to be scoped out of the LVIA:

- Solway Coast AONB;
- Solway Coast NSA;
- Galloway Hills NSA;
- Galloway Forest Dark Sky Park;
- Upper Teesdale NSA;
- Nith Estuary NSA;
- East Stewartry NSA; and
- Langholm Hills RSA.

5.7.3 Visual Receptors

75. The following visual receptors will be scoped out of the LVIA due to none or limited potential visibility of the Proposed Development:

- Residents in Sanquhar;
- Residents in Auldgirth;
- Residents in Leadhills; and
- Recreational and Marine Receptors within the Solway Firth

5.8 Limitations and Assumptions

76. The assumptions and limitations set out below have been encountered during the production of this Scoping Report. Any further assumptions and limitations encountered during the assessment process will be set out in the EIA Report.

77. Limitations:

- The turbine layout that the scoping proposals are based on is not final, and therefore there is potential for the type, number, or extent of landscape and visual receptors to change for the EIA Report.
- A detailed site survey has not been carried out to date.
- Proposed viewpoints have not been verified in the field; therefore, viewpoint coordinates are indicative.
- The cumulative sites included above are based on current available information. It is acknowledged that the number and status of the windfarm sites in planning are likely to change prior to the EIA. Therefore, a cut off for the final list of cumulative sites to inform the EIA Report will be set at the date of assessment design freeze.

78. Assumptions:

- It has been assumed that further consultation with the consultees will be undertaken during the LVIA process to confirm any outstanding information following the Scoping Opinion.

Question 1: Are the proposed Study Areas acceptable for the LVIA and CLVIA?

Question 2: Are there any comments on the overall methodology proposed to assess effects on landscape and visual receptors, including cumulative effects?

Question 3: Are the proposed viewpoint locations acceptable, including for lighting assessment?

Question 4: Are there any other scoping or in planning windfarm sites, in addition to those illustrated, to consider as part of the cumulative assessment?

Question 5: Has the consultee identified any further landscape or visual receptors to be considered within the assessment (e.g. where potential significant effects may occur)?

Question 6: Do you agree with the landscape and visual receptors proposed to be scoped out?

Question 7: Are there any other relevant consultees who should be consulted with respect to the LVIA?

6 Ecology

6.1 Consultation

79. To date, no consultation has been undertaken. A preliminary desk-based review of relevant ecological information available for the Site and the surrounding area has been undertaken. As part of the desk study, consultation to obtain additional data on ecological information within the Site and wider surrounding area will be undertaken and is anticipated to include the following organisations:

- SNH;
- South West Scotland Environmental Information Centre;
- Scottish Badgers;
- Dumfries and Galloway Bat Group;
- Galloway Fisheries Trust;
- Forestry and Land Scotland;
- Botanical Society of Britain and Ireland; and
- Any other relevant organisation identified through the course of the EIA.

6.2 Baseline Conditions

80. Freely downloadable corporate datasets were searched for information regarding the presence of statutory designated sites of nature conservation interest within 2km of the Site. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) (collectively referred to as 'nationally designated sites') or locally designated sites (e.g. Local Nature Reserve (LNR), Local Wildlife Site (LWS)) were identified using the SNH Site Link Portal[22]. This search was extended to 10km for Natura 2000 sites (Special Areas of Conservation (SAC)) and internationally designated wetlands of International Importance (Ramsar sites) (collectively referred to as 'internationally designated sites'). Special Protection Areas (SPAs) are discussed in section 7.2 below.

81. No internationally, nationally or locally designated sites for nature conservation are within the Site Boundary. One statutory designated site has been identified within the search which is Black Loch SSSI located 1km south of the Site. Black Loch SSSI is designated for supporting basin fen habitats and shows a transition from a central fen to drier moorland with a variety of vegetation types. Only one non-statutory designated site has been identified which is the Transition Area of the Galloway

[22] https://sitelink.nature.scot/home

and Southern Ayrshire Biosphere Reserve, which is 3km west of the Site. This designation helps promote the integrated and sustainable management of the area, including sustainable development.

82. Ten small pockets of the woodland present within the Proposed Development boundary are listed under the Ancient Woodland Inventory (AWI), which are predominantly restricted to the edges of the Site Boundary. All of the woodland within the Site is listed under the Semi-natural Ancient Woodland Inventory. There is also one pocket at the north of the Site which is listed under Native Woodland Survey of Scotland[23].

83. The desk-based study will also review ecological data and reports associated with nearby surrounding windfarm developments, most notably the operational Harestanes and Dalswinton Windfarms.

84. To further inform the baseline, the following ecological surveys will be undertaken across the Site and within appropriate survey areas for each receptor/species group. This information is summarised in Table 6.1.

Table 6.1 Summary of surveys to inform the baseline

Survey	Purpose	Survey Area
National Vegetation Classification (NVC) survey	To record the detailed botanical composition of habitats of particular conservation interest (e.g. potential Ground Water Dependent Terrestrial Ecosystems (GWDTE) and Annex I habitats of the EU Habitats Directive etc.) in line with standard NVC technique and in accordance with GWDTE guidance[24].	Within 250m of each turbine location, access routes and borrow pits.
Protected species walkover	An initial walk over to search for signs of all protected species to inform the dedicated protected species surveys.	Across the entire Proposed Development.
Otter *Lutra lutra* and water vole *Arvicola amphibius* survey	A search for signs of otters and water voles and their resting places (holts/couches or burrows), in line with Chanin (2003)[25] and Dean et al (2016)[26].	Up to 200m upstream and downstream of watercourse access crossing locations and within 200m from each turbine
Red squirrel *Sciurus vulgaris* and pine marten *Martes martes* survey	A search for signs of red squirrel and pine marten and their breeding sites (dreys and dens). Surveys will follow best practice guidance for red squirrel[27] and pine marten[28] survey guidance.	Within 250m from each turbine location and along the access tracks.
Badger *Meles meles* survey	A search for signs of badger and their setts will be undertaken following published survey guidance[29].	Within 250m of each turbine and along the access tracks.
Bat Habitat Suitability Assessment (HSA) and static bat detector deployment	To identify features (e.g. trees and built structures, etc.) considered to offer suitable roosting habitat for bats and key commuting and foraging routes, in line with Collins (2016)[30] and following Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation Guidance[31].	Within 250m of each turbine location and along the access tracks.

[23] https://open-data-scottishforestry.hub.arcgis.com/
[24] Scottish Environment Protection Area (2017). SEPA Guidance Note 31: Guidance on assessing the impacts of development proposals on groundwater abstractions and groundwater dependant terrestrial ecosystems.
[25] Chanin P (2003). Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough
[26] Dean, M., Strachan, R., Gow, D. and Andrews R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Matthews and Paul Chanin. The Mammal Society, London.
[27] Forestry Commission (2009). Practical techniques for surveying and monitoring squirrels.
[28] The Mammal Society (2012). UK BAP Mammals Interim Guidance for Survey Methodologies, Impact assessment and Mitigation. The Mammal Society. Southampton.
[29] Scottish Badgers (2018). Surveying for Badgers Good Practice Guidelines
[30] Collins J. (ed.) (2016). Bat Surveys for Professional Ecologists, Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.
[31] SNH (2019). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

85. In addition to the above field surveys a habitat suitability assessment for reptiles and amphibians, to be informed by the NVC will be undertaken. This assessment will identify areas most suitable to support these receptors up to 250m from the turbine locations and access tracks. These surveys will determine whether additional surveys are required and will be used to inform the design of Proposed Development.

6.3 Sensitive Receptors

86. Based on the information provided in Section 2.3 Proposed Development and Section 6.2 Baseline Conditions, the following potential sensitive ecological receptors have been identified:

- **Habitats on Site including bog and GWDTE** - the Site includes potentially sensitive habitats;
- **Otters** - the Water of Ae and other burns connected to the Water of Ae are present across the Site and adjacent terrestrial habitat are potentially used by otters;
- **Water vole** – the Site crosses several drains, ditches and burns potentially utilised water vole;
- **Red squirrel** - the Site contains coniferous woodland habitat potentially utilised by red squirrel for shelter and foraging;
- **Pine marten** - the Site contains coniferous woodland habitat potentially utilised by pine marten for shelter and foraging;
- **Badger** – the Site contains potential sett creation habitat within the woodland;
- **Bats** – the Site crosses woodland habitat potentially utilised by bats for foraging, commuting or roosting;
- **Fish** – the Site crosses watercourses connected to the Water of Ae potentially utilised by salmonid species;
- **Reptiles** – the Site potentially provides suitable habitat for protected reptile species including adder *Vipera berus*; and
- **Amphibians** – the wet habitats of the Site provide the potential for breeding and foraging habitat for amphibian species.

6.4 Mitigation

87. Significant effects upon ecological receptors will be avoided or minimised where possible through the conceptual design process. Good practice during construction and operation of the Proposed Development would also be implemented.

88. Where likely significant effects cannot be mitigated against, measures to prevent and reduce these adverse effects will be proposed and will be set out in the EIA Report.

6.5 Issues Scoped Out

89. In light of the characteristics of the Proposed Development the prevailing habitats and geographical location it is considered appropriate to **scope out** the following species/groups of the EIA:

- **Freshwater invertebrates (including freshwater pearl mussel *Margaritifera margaritifera*):** no recent records of freshwater pearl mussel have been recorded within the catchment and the risk of this species being present is expected to be low. SNH will be consulted for any fresh water pearl mussel records they hold for the Site and wider catchment and the fish habitat suitability surveys will seek to assess habitat suitability for pearl mussels as well. Appropriate mitigation measures will be adopted to protected watercourses, which by extension would protect freshwater invertebrates (including freshwater pearl mussels).
- **Great crested newt surveys**: at this time great crested newt surveys have been scoped out due to the habitat present on Site being predominantly coniferous woodland producing an acidic aquatic environment which is considered unsuitable to support the species. Additionally, the only one record of great crested newts was identified in the desk study which is over 5km from the Site. It is therefore considered unlikely that the species will be present within the Site.
- **Terrestrial invertebrates**: no species of interest are known to utilise the Site and there is a vast extent of similar habitat in the surrounding area, compared to the small extent of Site which will be affected by the Proposed Development.

6.6 Likely Significant Effects

90. Potential effect pathways have been identified for both construction and operational phases in relation to the sensitive receptors identified in Section 6.3.

91. Anticipated potential effect pathways for construction of the Proposed Development are:

- **Habitat loss and degradation** – habitat loss and degradation could occur as a result of the felling of woodland, construction of access tracks, pollution and disruption of hydrological pathways, which could also result in temporary and permanent effects to GWDTEs on the Site.

- **Disturbance and displacement** - construction of the Proposed Development has the potential to disturb ecological receptors or displace them from otherwise suitable habitat within and immediately adjacent to the Site. Receptors particularly susceptible to disturbance and displacement are otter, bats, badger, red squirrel, pine marten and water vole.
- **Injury or direct mortality** - construction activity has the potential to injure or kill receptors, particularly slow-moving or cryptic ecological receptors including reptiles and amphibians. In addition, during felling and excavation activities bats, red squirrels and water voles could be killed or injured.

92. Anticipated potential effect pathways and cumulative effects during operation are:

- **Injury and mortality** - the operation of the turbines could pose a collision risk and barotrauma for bats
- **Disturbance and displacement** – the operation of the wind turbines and activities associated with site maintenance has the potential to disturb bats, red squirrels, pine marten, otter, water vole and badger or displace them from otherwise suitable adjacent habitat.

93. It is considered that all the potential effect pathways identified above have the potential to result in significant adverse effects. An assessment of the cumulative effects of the Proposed Development in conjunction with other proposed developments will also be undertaken.

6.7 Assessment Methodology

94. The Ecological Impact Assessment (EcIA) will be completed in accordance with the Chartered Institute of Ecological and Environmental Management's (CIEEM) EcIA guidance[32]. The assessment will use the ecology baseline, as informed by the desk study, consultation and field surveys, to identify the sensitive receptors that could be affected by the construction or operation of the Proposed Development. Each receptor will be assigned a geographic level of importance based on its national and local conservation status and population/assemblage trends and other relevant criteria (including size, naturalness, rarity and diversity). Details of the Proposed Development will then be used to assess what level of impact each receptor is likely to experience and whether or not the effects will be beneficial or adverse, significant or negligible, and temporary or permanent.

6.8 Limitations and Assumptions

95. This Scoping Report was undertaken prior to consultation being undertaken. Therefore, the proposed scope of surveys may change to take on board the responses from consultation and is subsequent to collection of further baseline information.

Question 8

Do you agree with the Ecology proposed approach for baseline collection, prediction of effects and significance assessment?

7 Ornithology

7.1 Consultation

96. No consultation has been undertaken to date to inform this Scoping Report. As part of the desk-based study to inform the Ornithology Chapter of the EIA Report, consultation will be undertaken to obtain recent historical data on ornithological sensitivities associated with the Site and wider surrounding area. This is expected to involve consultation with the following organisations:

- SNH;
- Royal Society for the Protection of Birds (RSPB) Scotland;
- Dumfries and Galloway Raptor Study Group;
- South West Scotland Environmental Information Centre;
- Wildfowl and Wetlands Trust;
- Forestry and Land Scotland; and
- Any other relevant organisations identified through the EIA.

[32] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland. Version 1.1

7.2 Baseline Conditions

97. In addition to the desk study and consultation exercise detailed above, a review of ornithological data and reports associated with nearby surrounding windfarm developments, most notably Harestanes, Minnygap and Dalswinton Windfarms will be undertaken.

98. A preliminary desk-based review of relevant designated sites of nature conservation interest associated with the Site and the surrounding area has been undertaken as well as the collection of data from flight activity surveys over the 2019/20 non-breeding season (September 2019-February 2020).

99. No internationally, nationally or locally designated sites for nature conservation with ornithological interests are located within 2km of the Site. The nearest internationally designated sites to the Site are:

- Castle Loch, Lochmaben SPA which is located approximately 10km to the southeast and is designated for supporting important populations of overwintering Icelandic/Greenlandic pink-footed geese *Anser brachyrhynchus*.
- Upper Solway Firth and Marshes SPA which is located approximately 17km to the south of the Site and is designated for supporting a variety of overwintering wildfowl including Icelandic/Greenlandic pink-footed geese and Svalbard barnacle geese *Branta leucopis*.

100. To date, non-breeding season flight activity surveys to inform the EIA have been undertaken between September 2019 and February 2020 (inclusive). A total of nine Vantage Points (VP) were selected to cover the Site plus a surrounding 500m survey buffer in accordance with standard industry guidance[33]. Survey effort for each VP corresponded to the recommended survey effort of 36 hours per season per VP. The following species were recorded during the wintering non-breeding season flight activity surveys:

- Goshawk *Accipiter gentilis* – 28 flights;
- Greylag goose *Anser anser* – two flights;
- Hen harrier *Circus cyaneus* – seven flights;
- Pink-footed goose –nine flights;
- Red kite *Milvus milvus* – three flights;
- Common snipe *Gallinago gallinago* – three flights;
- Whooper swan *Cygnus cygnus* – one flight.

101. To further inform the ornithological baseline conditions the following surveys will be undertaken over the 2020 breeding season (encompassing March to August 2020 (inclusive)):

- **Flight activity surveys** – undertaken from the same nine VPs as utilised during the non-breeding season surveys. These will be undertaken following industry standard guidance[33] from March to August 2020 (inclusive) and programmed to capture 36 hours of effort per VP over the season. The surveys will include a proportion of dusk VPs to capture owl activity.
- **Black grouse population/lek surveys** – up to two visits between late March to May 2020 comprising a preparatory walkover to locate suitable habitat and evidence of black grouse presence followed by surveys of any leks located to record the maximum number of lekking males and the number of attending females. The survey area will encompass suitable habitat within the Site and a surrounding buffer of 1.5km and be undertaken following industry standard methods[34].
- **Breeding raptor surveys** – undertaken across a survey area including the Site and a surrounding buffer of up to 2km to record breeding activity of target raptor species (e.g. species listed on Annex I of the EU Birds Directive and/or Schedule 1 of the Wildlife and Countryside Act 1981). Four survey visits will be undertaken between April and July 2020 (inclusive) following industry standard guidance[35].

[33] SNH (2017). Recommended bird survey methods to inform impact assessment of onshore windfarms. SNH Guidance. SNH, Battleby.
[34] Gilbert, G., Gibbons D.W., and Evans, J (1998). Bird Monitoring Methods. RSPB, Sandy.
[35] Hardey, J., Crick, H., Wernham, C., Riley, H. & Thompson, D. (2009): Raptors: a field guide to survey and monitoring. 2nd Edition Edinburgh: The Stationery Office.

- **Moorland breeding bird surveys** – involving surveys of open ground and moorland within the Site and a surrounding buffer of 500m. The survey will be undertaken following SNH guidance[33] and based on a method adapted from industry standard methods[36]. A total of four survey visits will be undertaken between April and July 2020 (inclusive).
- **Nightjar surveys** – involving surveys of suitable habitat within the Site and a surrounding buffer of 500m. Surveys will comprise two rounds of surveys between June and mid-July. Surveys will be undertaken around dawn and/or dusk following industry standard guidance[34].

7.3 Sensitive Receptors

102. Based on the information provided in Section 7.2 Baseline Conditions, the following potential sensitive ornithological receptors have been identified:

- **Breeding raptors** – based on observations recorded during the non-breeding season flight activity surveys and knowledge of the surrounding area, breeding raptors are anticipated to be present on and immediately adjacent to the Site. Breeding raptors could potentially include, but are not limited to goshawk, red kite and possibly hen harrier.
- **Breeding waders** – based on the open farmland and moorland habitats immediately surrounding the Site breeding waders such as common snipe, curlew *Numenius arquata* and lapwing *Vanellus vanellus*, may be present.
- **Black grouse** – based on the geographical location and habitat conditions lekking and breeding black grouse have the potential to be present on or adjacent to Site.
- **Nightjar -** based on the geographical location and habitat conditions breeding nightjar have the potential to be present on or adjacent to Site.

7.4 Mitigation

103. The requirement for ornithological mitigation will be confirmed through the EIA once the design of the Proposed Development is fixed and definitive ornithological sensitivities have been identified. However, if ornithological receptors are identified which pose a significant constraint to the Proposed Development, suitable mitigation measures will be explored and identified to avoid or minimise any significant impacts which may be predicted. Any proposed mitigation measures will be dependent on the nature and scale of the associated impacts but might include sensitive design and positioning of turbines and sensitive timing of construction works. Any identified mitigation will be described in full in the EIA Report.

7.5 Issues Scoped Out

104. In light of the prevailing habitats and geographical location it is considered appropriate to scope out further assessment of the following designated sites and species/groups:

7.5.1 Migratory waterfowl

105. Additional flight activity and field use survey effort for migratory waterfowl is not considered to be necessary based on:

- comparatively low levels of flight activity by such species recorded during the non-breeding season flight activity surveys, particularly during the autumn passage months, which is anticipated to be reflected during spring passage; and,
- absence of suitable foraging habitat within the Site and limited expectation that fields within 500m of the Site (to the south and east) would be used by substantial numbers of locally occurring species. This is supported by Mitchell (2012)[37] which demonstrates that pink-footed geese associated with the relatively nearby Castle Loch, Lochmaben and Upper Solway Marshes and Flats SPAs foraging in fields around the Solway Estuary, with smaller proportions heading due north and northwest (towards Forest of Ae) to forage around the lower Water of Ae valley. Only a very small proportion of birds are reported to forage in fields in proximity to Forest of Ae in recent years. Such flocks are however, not anticipated to pose any constraint to the Proposed Development, based on their distribution relative to the Site as presented in Mitchell (2012)[37]. Incidental observations of foraging geese would nonetheless be recorded during ongoing flight activity and other surveys.

7.5.2 Castle Loch, Lochmaben SPA and Upper Solway Firth and Marshes SPA

106. Of the qualifying species listed for these SPAs only pink-footed geese were recorded over the Site during the non-breeding season flight activity surveys. All nine flights of pink-footed geese were recorded in September and October which suggests records are associated with a limited number of (predominantly omni-directional, southward) migratory flights and not diurnal

[36] Brown, A.F. and Shepherd, K, B. (1993). A method for censusing upland breeding waders. Bird Study, 40: 189-195.
[37] Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / SNH Report, Slimbridge. 108pp.

foraging movements. As described for 'migratory waterfowl' above there is only a low potential for small numbers of pink-footed goose associated with these SPAs to forage in the vicinity of the Site.

7.6 Likely Significant Effects

107. Impacts associated with the Proposed Development on ornithological receptors include habitat loss and degradation during construction, and disturbance and displacement and injury and direct mortality of individuals during both construction and operation.

108. The potential effects of these impacts on ornithological receptors during the construction and operation of the Proposed Development include:

- changes in the distribution and abundance of locally occurring bird populations due to construction related disturbance, potentially affecting breeding success and survivorship;
- changes in the distribution and abundance of locally occurring bird populations due to direct habitat loss during construction, or through displacement during operation;
- changes in the distribution and abundance of locally occurring bird populations as a result of injury and mortality of active nests and young during construction, and through collision with the operational turbines; and
- cumulative effects associated with other projects which influence the same local or biogeographic population.

7.7 Assessment Methodology

109. The ornithological aspect of the EcIA will be completed in accordance with the Chartered Institute of Ecological and Environmental Management's (CIEEM) EcIA guidance[38]. The assessment will use the ornithology baseline, as informed by the desk study, consultation and field surveys, to identify the sensitive receptors that could be affected by the construction or operation of the Proposed Development. Each receptor will be assigned a geographic level of importance based on its national and local conservation status and population/assemblage trends and other relevant criteria (including size, naturalness, rarity and diversity). Details of the Proposed Development will then be used to assess what level of impact each receptor is likely to experience and whether or not the effects will be beneficial or adverse, significant or negligible, and temporary or permanent.

7.8 Limitations and Assumptions

110. It is assumed that recent ornithological data will be available from other windfarm developments in the nearby surrounding area and will be provided by other relevant stakeholders, including FLS. With consideration of this supplementary data, it is expected that a single years' worth of novel Site-specific ornithological survey data will be sufficient to inform a robust EIA.

Question 9
Do you agree with the Ornithology proposed approach for baseline collection, prediction of effects and significance assessment?

8 Cultural Heritage

8.1 Consultation

111. No consultation has taken place to date. This report will form the basis for the initial consultation with Historic Environment Scotland (HES) and the Dumfries and Galloway Council Archaeologist in relation to the Proposed Development.

112. Consultation will be undertaken to determine and identify which assets should be assessed for Setting effects, as informed by the blade tip ZTV. The requirement for visualisations (in the form of wirelines or photomontages) will also be agreed through consultation and produced from the key Cultural Heritage assets assessed.

[38] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland. Version 1.1

8.2 Baseline Conditions

113. The Cultural Heritage assets within the Site and in a 10km buffer surrounding it are listed in Table 8.1 and illustrated on Figure 2.1 Environmental Context. A 10km preliminary assessment buffer was applied to take into consideration potential Setting effects on Cultural Heritage assets.

Table 8.1 Cultural Heritage Designations

Designation/sensitivity	Assets within Proposed Development and assessment buffer
Within Site	• 1 Scheduled Monument • 28 Undesignated Assets – Predominantly post-Medieval, with Prehistoric findspots – Likely to be further assets identified through Site survey work and through HER data requests from D&G Council.
Within 5km buffer of Site there are a further:	• 18 Scheduled Monuments • 47 Listed Buildings – 2 Category A Listed – 31 Category B Listed – 14 Category C Listed • 3 Archaeologically Sensitive Areas • 7 Non Inventory Garden and Designed Landscapes • Likely to be further assets identified through HER data requests from Dumfries and Galloway Council
Within 10km buffer of Site there are a further:	• 55 Scheduled Monuments • 234 Listed Buildings – 28 Category A Listed – 152 Category B Listed – 54 Category C Listed • 3 Inventory Garden and Designed Landscapes • 2 Conservation Areas

8.3 Sensitive Receptors

114. It is considered only those assets within a relative proximity to the Proposed Development may potentially receive a significant effect on their settings. As such, detailed assessments would be undertaken for designated sites which are within the ZTV, as well as for heritage assets up to 10km identified during consultation or with a larger presence in the landscape such as Parks and Gardens.

115. The assessment will also focus on the undesignated assets noted within the Site that have been recorded as archaeological sites of local importance. Furthermore, the potential for unknown archaeological sites within and adjacent to the Site will be considered and assessed.

8.4 Mitigation

116. The Applicant is committed to implementing accepted good practice during the design, construction and operation of the Proposed Development, thereby ensuring that many potential effects on Cultural Heritage can be avoided or reduced. Measures will be embedded into the design to ensure that infrastructure avoids all statutory designated assets. Setting effects will be avoided or reduced where possible through design.

117. The results of the assessment will determine the requirement for any appropriate mitigation measures for the protection of the Cultural Heritage resource or, where necessary, the investigation and recording of any sites likely to be affected by the Proposed Development where preservation in situ cannot be achieved.

8.5 Issues Scoped Out

118. The following elements are proposed to be scoped out of the Cultural Heritage assessment as none fall within 10km of the Proposed Development:

- World Heritage Sites;
- Inventory Battlefields; and

- Marine Protected Areas.

119. Once operational, the potential for direct effects upon known and unknown undesignated assets will be removed. Therefore, assessment of direct impacts during operation of the Proposed Development will also be scoped out of the Cultural Heritage assessment.

8.6 Likely Significant Effects

8.6.1 Construction

120. The potential direct effects related to the construction of the Proposed Development include:

- permanent, complete or partial loss of an archaeological feature or deposit as a result of ground excavation;
- permanent or temporary loss of the physical and/or visual integrity of a feature, monument, building, or group of monuments;
- damage to resources as a result of ground excavation;
- damage to resources due to compaction, desiccation or waterlogging; and
- damage to resources as a result of ground vibration caused by construction.

121. There is one Scheduled Monument contained within the Site Boundary and a number of undesignated assets that have the potential to be directly impacted upon during construction. The embedded mitigation will ensure that statutory designated assets are not directly impacted upon, and undesignated assets will be avoided where possible through the design process.

122. The potential indirect effects related to the construction of the Proposed Development include:

- the movement and activity of large construction machinery, usually with flashing hazard lights;
- views of cranes or lifting equipment impacting on key sensitive ridgelines;
- temporary spoil heaps and disposal areas; and
- flood lighting of areas for evening and morning working during the winter.

123. These effects will be temporary and it is considered only those assets within, or within relatively close proximity to the Proposed Development may potentially receive an effect on their Setting during construction, with these effects unlikely to be significant.

8.6.2 Operation

124. The potential indirect effects related to the operation of the Proposed Development include:

- the increased visual presence of the windfarm and the intervisibility between the windfarm and archaeological or Historic sites or features which may affect their setting, depending on a number of additional considerations;
- the introduction of new lighting changing the night-time view; and
- cumulative effects with other existing or proposed developments.

125. It is considered only those assets within, or within relatively close proximity to the Proposed Development (circa. 5km) may potentially receive a significant effect on their settings during construction and operation. The designated assets out with the 5km buffer can be scoped out of full assessment where the distances from the Proposed Development, or the presence of intervening topography, or other screening significantly reduces the likelihood of indirect impacts from the Proposed Development. This will be confirmed and reported in the EIA Report.

8.7 Assessment Methodology

126. The Cultural Heritage assessment will be supported through the production of a fully illustrated archaeological desk-based assessment. This will include a detailed baseline compiled through a broad and standard range of data sources, including the Historic Environment Record (HER), the Historic Environment Scotland's National Heritage List and National Record for the Historic Environment (SNRHE), local authority data sources along with published works and cartographic sources, and topographic, geology and geotechnical data, where available.

127. A site walkover will be undertaken to assess the visible archaeological and built heritage resource and archaeological potential of the Proposed Development, with the results included within the assessment. This will allow for the determination

of whether previously unrecorded historic features are present on-site. The results of any new archaeological sites will be discussed with the Dumfries and Galloway Archaeologist and HES.

128. The significance of an effect is assessed by looking at what the changes will be against the existing, or predicted, baseline as a result of the Proposed Development. The method for assessing the significance of effect will be based on the environmental value (or sensitivity) of a receptor and the magnitude (degree of change) of the impact. Sensitivity will be assessed as high, medium, low, or negligible, and magnitude will be assessed as substantial, moderate, slight, or negligible in line with the Environmental Impact Assessment Handbook[39]. The work will be undertaken in accordance with the standards set by the Chartered Institute for Archaeologists (CIfA), as well as the HES's Guidance on Managing Change in the Historic Environment. All elements of the assessment will also be undertaken in accordance with the following policies and guidelines:

- By-laws: Code of Conduct, CIfA[40];
- Standards and Guidance for Historic Environment Desk Based Assessment, CIfA [41]; and
- Standards and Guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment, CIfA [42].

8.8 Limitations and Assumptions

129. The scoping assessment related to Cultural Heritage is based on the Site Boundary set out within Figure 1.1 Site Location. Furthermore, the information related to the designated heritage assets was derived from publicly available datasets provided by HES through the Historic Environment Scotland Portal[43].

Question 10
Do you agree with the Cultural Heritage proposed approach for baseline collection, prediction of effects and significance assessment?

9 Hydrology, Hydrogeology, Geology and Peat

9.1 Consultation

130. There has been no consultation undertaken to date for Hydrology, Hydrogeology, Geology and Peat. The following consultees will be approached for information to inform the EIA:

- Scottish Environment Protection Agency (SEPA) – regarding licenced abstractions, supplies and engineering activities in the water environment;
- SNH – regarding designated sites;
- Dumfries and Galloway Council – regarding private water supplies; and
- Scottish Water – regarding public water supplies.

9.2 Baseline Conditions

131. British Geological Survey (BGS) Geoindex[44] indicates the Site is underlain, from west to east, by the Queensberry Formation (sandstone, typically medium to coarse-grained, but ranging from fine to very coarse-grained, locally pebbly), Selcoth Formation (sandstone, typically fine to medium-grained but ranging from very fine to coarse-grained), Hartfield Formation (red, laminated and cross-laminated silty sandstone interbedded with pebbly sandstone and lenses of breccio-conglomerate), Carghidown Formation (greywacke beds dominantly less than 0.5m thick) with interbedded mudstones including some red

[39] SNH, 2018 Environmental Impact Assessment Handbook
[40] Chartered Institute for Archaeologists, 2014, By-laws: Code of Conduct
[41] Chartered Institute for Archaeologists, 2017, Standards and guidance for desk-based assessment.
[42] Chartered Institute for Archaeologists, 2014, Standards and guidance for archaeological advice by historic environment services
[43] Historic Environment Scotland. Spatial Downloads. Available at: http://portal.historicenvironment.scot/spatialdownloads
[44] BGS (2019). BGS Geoindex Onshore. [online]. Available at: http://mapapps2.bgs.ac.uk/geoindex/home.html [Accessed 6th March 2020]

mudstone beds) and the Corncockle Sandstone Formation (fine to medium-grained, well sorted, red quartz sandstone with large scale aeolian cross-bedding). Small patches of Carron Basalt Formation (olivine basalt lava flows interbedded with thin breccias and sandstones), Moffat Shale Group (black shale, grey shale, bentonite, tuff) and Locherben Breccia Formation (well sorted sandy breccia with clasts of bladed greywacke, argillite and purple amygdaloidal basalt) are noted across the Site. There is one fault noted, running from northeast to southwest, which influences the underlying bedrock geology.

132. Superficial geology mapping (BGS, 2019) indicates that the majority of the Site is underlain by Langholm Till Formation (diamicton), with small pockets of peat and alluvium (silt and clay). River terrace deposits are noted adjacent to the larger watercourses, such as the Water of Ae.

133. The SNH Carbon and Peatland Map (2016)[45] indicates that Class 5 (peaty soil; no peatland vegetation) is predominant across the Site, with Class 3 (predominantly peaty soil with some peat soil; peatland with some heath) present at the northeast Site Boundary and a small area in the southwest of the Site at the summit of Knockespen. Soil Mapping[46] identified that there are four soil units present within the Site; peaty gleys, brown earths, non-calcareous gleys and peaty gleyed podzols. Of the four units, three of them include peat or peaty soils in their composition.

134. The majority of the Site spans across the Water of Ae Catchment, from the southwest to the northeast to Hareshaw Rig. There are a number of watercourses which are situated within or border the Site. These include the Water of Ae, Glenkiln Burn, Clachanbirnie Burn, Clatterstanes Burn, Wreaths Burn, Davie's Burn and Kirkland Burn.

135. A small area to the northeast of the Site is located within the Kinnel Water Catchment, comprising the Kinnel Water, Broadshaw Water and Mollin Burn.

136. Water of Ae (upstream of Goukstane Burn) (ID: 10661), Glenkiln Burn (ID: 10662) and Kirkland Burn (ID: 10660) have been classified by SEPA under the Water Framework Directive (WFD) (2018) as having an overall status of Moderate. These watercourses have a Poor ecological status and Good chemical status.

137. SEPA Flood Risk Management mapping[47] suggests that there is a high risk of river flooding locally within the Site, with this limited to areas immediately adjacent to Glenkiln Burn. Small areas at risk of surface water flooding are limited to isolated discrete locations within the Site. There are also extensive areas at risk of flooding downstream where the Glenkiln Burn converges with the Water of Ae, which is also at high risk.

138. The Drinking Water Quality Regulator for Scotland[48] mapping shows one private water supply (PWS) within 1km of the Site Boundary, Burrance. No public water supplies are known within the Site. Further information will be sought from Dumfries and Galloway Council, Scottish Water and SEPA to inform the assessment of effects on water supplies.

139. There are no nationally or internationally designated sites hydrologically linked to the Site.

140. Potential GWDTEs may be present within the Site. This will be confirmed by ecological surveys and hydrological assessments.

9.3 Sensitive Receptors

141. Sensitive receptors within the Study area include surface water features, PWS and peat. GWDTE may be present and specific NVC communities may be considered sensitive to the Proposed Development.

9.4 Mitigation

142. The majority of the assessed effects are likely to be mitigated through the iterative design process by considering environmental constraints relating to hydrology, hydrogeology, geology and peat. Further embedded measures include using existing track routes deemed to be acceptable and locating all development features out with 50m buffers of OS mapped watercourses as far as possible, for example minimising foundations or tracks in these zones. New watercourse crossings shall be minimised. Peat surveys and peat stability assessment data shall be used within the design process to minimise

[45] SNH (2016) Carbon and Peatland Map [online] Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ [Accessed 6th March 2020]
[46] MLURI (2013) Soil Mapping [online] Available at: http://map.environment.gov.scot/Soil_maps/?layer=1 [accessed December 2019]
[47] SEPA (2018) Flood Maps [online] Available at: http://map.sepa.org.uk/floodmap/map.htm [Accessed 6th March 2020]
[48] DWQR (2019). Private Water Supplies mapping [online]. Available from: https://dwqr.scot/private-supply/ [Accessed 6th March 2020]

incursion on these receptors. Specific mitigation measures shall also be identified to reduce potential impact from construction and operation of the Proposed Development.

143. During construction, industry good practice principles will be adopted and stated in the CEMP to limit the likelihood of an incident occurring and reduce the magnitude of any incident which does occur. This will be considered as embedded mitigation and may include:

- Fuel and chemical pollution prevention, including good practice storage and refuelling techniques;
- Erosion control and sediment management techniques;
- Appropriately designed, located and sized watercourse crossing structures;
- Appropriate mitigation shall be detailed for infrastructure within or adjacent to sensitive peat and GWDTE features, such as application of floating track and careful drainage design;
- Sustainable drainage techniques; and
- Site supervision and staff training.

9.5 Issues Scoped Out

144. The following effects are considered to be scoped out of further assessment as with the adoption of good design and implementation of standard good practice construction measures significant effects are considered unlikely:

- Reductions in natural flows arising from any temporary or permanent abstractions. This can be managed via the Construction Site Licence application process: and
- All watercourse structures would be designed and constructed following good practice techniques and would be of sufficient capacity to receive storm flows with an allowance for increased flows due to climate change. Therefore, it is considered that the Proposed Development will not increase local flood risk.

9.6 Likely Significant Effects

145. Adopting a precautionary approach at this preliminary stage, potential construction and operational (including cumulative) effects to be assessed in the EIA include:

- direct effects during construction from chemical or hydrocarbon pollution to surface water, groundwater, private water supplies, or soil reducing quality and resource value;
- direct effects during construction from sedimentation upon surface water quality;
- direct effects during construction that modify surface water drainage patterns, altering hydrological regime, hydromorphology, and private water supply yield;
- indirect effects during construction on surface water quality or surface water drainage patterns due to peat instability;
- direct effects during construction on groundwater flows and levels, including private water supply yield and groundwater dependent terrestrial ecosystems;
- direct effects during construction on soils, including soil erosion, excavation losses and compaction of soil; and
- direct effects during construction on soil loss due to peat instability.

9.7 Assessment Methodology

146. The assessment of effects will be carried out in accordance with the principles contained within a range of standard guidance documents from CIRIA, FLS, SEPA, SNH, the Scottish Government, and Scottish Renewables relating to water pollution, abstractions, watercourse crossings, sustainable drainage, peat management and landslide and hazard risk assessment, and forestry.

9.7.1 Desk Study

147. The desk-based study will be designed to assist in determining the characteristics of the Site and will collate baseline information from available sources to inform the subsequent field survey. The desk-based study will typically involve the following elements:

- Collation of geological, geomorphological and hydrogeological information;
- Use of topographical maps to identify watercourse catchments, water bodies, springs and boreholes within the study area;
- Identification of any designated or protected sites with a hydrological, hydrogeological, geological or geomorphological interest within a 5km buffer of the site;

- Estimation of low and peak stream flows;
- Collation of historical hydrological and flooding information (where available) for the immediate area and the main downstream watercourses;
- Collation of preliminary data on public and private water supplies;
- Collation of available meteorological data for the region; and
- Collation of available surface and groundwater quality data for the region.

9.7.2 Field Surveys

148. The field survey will take the form of a reconnaissance level walkover with three objectives: ground-truthing of desk study data; identification of topographical and other features not shown on mapping; and placing the Site and surrounding landscape in context, including determining the general hydrological conditions of the Site.

149. Specific field survey tasks will gather site information on peat depth (based on phase 1 and phase 2 probing), peat stability, watercourse crossings and geology.

150. Data collected during the field survey will, therefore, provide a profile of the characteristics of the area, highlighting sensitive areas and constraints to the design of the Proposed Development.

9.7.3 Assessment

151. Following the baseline studies and the confirmation of final layout design, the potential effects on the hydrology, hydrogeology, geology and peat will be assessed based on guidance noted above. The effect of turbines, access tracks, cable trenches, construction compounds and any other temporary and permanent infrastructure associated with the Proposed Development will be considered. Activities to be considered may include watercourse crossings, excavation, drainage, importation of material and the site storage of materials, including soil, fuel and chemicals.

152. Central to the assessment will be the assumption that good practice regulatory construction and operational measures will be implemented (see 'Mitigation' section above).

153. The significance of likely effects will be categorised using professional judgement against a matrix, considering three key factors: the sensitivity of the receiving environment, the likelihood of that effect occurring (or probability) and potential magnitude of any effect that does occur. Major and moderate effects will be considered as significant in the context of the EIA Regulations.

154. The sensitivity of receptors will be based on factors that include designated status, water quality, aquatic ecology, fluvial geomorphology and groundwater vulnerability, with sensitivity ranging from low-medium-high. Magnitude will be evaluated based on the change that occurs to the baseline condition, considering temporal issues and ranging from negligible-minor-moderate-major. The probability of an effect occurring will be evaluated as ranging from low-medium-high.

155. The assessment will draw largely from the following supporting technical appendices:

- Watercourse crossings - locations identified following design freeze shall be visited, with photographs taken, dimensions and channel characteristics noted.
- GWDTE – in accordance with SEPA guidance[49]; relevant NVC communities within 100m and 250m buffer zones around the proposed infrastructure will be identified and assessed considering the change in groundwater contribution areas pre and post-development.
- Peat stability risk assessment (PSRA) - shall include characterisation of the peatland features, description of observed peat instability, interpretation of aerial imagery, analysis of peat depth and factor of safety stability data to highlight any areas of specific initial concern (high or moderate risk) in line with current guidance[50].
- Soil and peat management plan (SPMP) - estimation of the excavated peat volume will be based on site-specific data relating to infrastructure dimensions, measured peat depths and threshold values for floating track. The plan will utilise

[49] SEPA (2017) Land Use Planning System SEPA Guidance Note 31, Guidance on assessing the impacts of development proposals on groundwater abstractions and groundwater dependent terrestrial ecosystems, Version 3;
[50] Scottish Executive (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments, 2nd Edition

peat depth data gathered during the peat stability risk assessment to identify quantities of soil and/or peat that will require excavation in order to construct the Proposed Development, in line with current guidance[51].

156. Residual effects, post-mitigation, shall be identified and assessed as either significant or non-significant.

9.8 Limitations and Assumptions

157. The fieldwork will follow standard 'reconnaissance' field methods in which watercourses will be visited close to planned access routes and peat probing will be undertaken on a 100m grid across the region of the Site which the potential for infrastructure to be located; SEPA will be consulted should an alternative method be proposed. Following the provision of the infrastructure design, specific infrastructure locations will be visited for peat probe survey and stability assessment.

158. It is recognised that the equipment employed to determine peat depth will also pass through other soil types before 'refusal depth', thus peat depth results incorporate all soil through which probing rods pass, such as gleys, podzols and brown earth soils, as indicated on soil mapping within this Site. This is a conservative approach to ensure soil depths are accurately gauged but is anticipated to provide an overestimate of peat depths, given that mapping indicates peat overlying other soil types.

159. Private water supply information will be requested from Dumfries and Galloway Council; however, it is recognised that information provided may be incomplete. Additionally, information on supplies serving abandoned properties and livestock welfare may not be available.

Question 11

Do you agree with the Hydrology, Hydrogeology, Geology and Peat proposed approach for baseline collection, prediction of effects and significance assessment?

10 Noise

10.1 Consultation

160. At this stage, no consultation has been undertaken.

161. The baseline information and proposed methodology contained within this Scoping Report will form the basis of consultation to be undertaken with the Environmental Health Department of Dumfries and Galloway Council as part of the EIA.

10.2 Baseline Conditions

162. Initial desk-based review and assessment work has been undertaken to assist in determining the scope and approach of the noise and vibration assessment to be undertaken. This has included a review of national and local planning policies, the identification of existing noise and vibration sensitive receptors close to the Site, and the identification of other existing and proposed windfarm developments that have the potential to give rise to cumulative effects.

10.2.1 Study Area

163. For the assessment of construction noise and vibration, a 300m Study Area will be adopted. It is considered that beyond this distance, construction noise and vibration levels would be sufficiently low that significant effects would not arise.

164. For operational noise, a 5km Study Area will be adopted. This is considered sufficient to ensure that all potentially significant cumulative noise effects will be addressed. The operational noise assessment will extend to include a representative sample of the receptors within this radius in closest proximity to both the Proposed Development and the other identified windfarms such that all locations of potential cumulative effects are fully accounted for.

[51] Scottish Renewables / SEPA (2012) Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste

165. No proposed turbines are located within 1km of any of the receptors identified, and other construction works such as track upgrades/construction and borrow pit construction would be at least 300m from residential receptors.

166. The study areas are therefore measured from the vicinity of the proposed turbine locations, rather than the Site Boundary.

10.2.2 Prevailing Local Noise Sources

167. Local noise sources can broadly be split into two categories: those which occur naturally, and those which are man-made. Local man-made sources in proximity to the site and the receptors identified below are likely to include existing windfarms and road traffic. Natural sources of noise are likely to include bird song, the wind, rustling vegetation, rainfall, animals and watercourses.

10.2.3 Cumulative Developments

168. A review of other identified windfarms in the vicinity of the Site has been undertaken. The following developments within an approximate 5km radius of the Site Boundary have been identified as having the potential to give rise to a cumulative noise impact:

- Harestanes Windfarm (adjacent to the north) – operational;
- Dalswinton Windfarm (2.7km southwest) – operational; and
- Minnygap Windfarm (adjacent to the north) – operational.

169. The environmental statements for Dalswinton and Minnygap Windfarms are not available through the Dumfries and Galloway Council planning portal, so there is limited information available about their noise outputs. This information will be sought via consultation to inform the EIA Report.

170. Other potential cumulative windfarms have been considered but are scoped out for the following reasons:

- Blackwood windfarm (5km southwest) – refused planning permission;
- Auchencairn windfarm (3.3km west) – planning application withdrawn; and
- Duncow Common windfarm (2km south) – at scoping but not submitted for planning permission.

171. As Duncow Common windfarm is currently at scoping stage, the progress of this scheme will be tracked and may be included if an application is submitted during the assessment work. A cut-off date will be agreed during consultation with Dumfries and Galloway Council beyond which no new cumulative schemes will be included for cumulative assessment.

10.2.4 Baseline Noise Levels

172. A key requirement of the assessment methodology[52] is that noise limits for windfarms are set based on noise levels measured in the absence of any wind turbine noise. The presence of the windfarms identified above is likely to prevent a background noise survey being practical, as any noise measurements would unavoidably measure noise associated with the existing windfarms.

173. Therefore, it is proposed that in the first instance, accurate background noise level data in the absence of wind turbine noise will be determined by means of a detailed review of the noise assessment and survey work undertaken and submitted in support of the planning applications for the now operational developments.

174. If it is identified that insufficient data is available, or that the data available is otherwise not suitable for the assessment purposes, then alternative approaches will be agreed during consultation. These may include basing the assessment on seeking compliance with the noise level limits already imposed on the operational windfarms or carrying out a new baseline noise survey and filtering the measurement data for upwind conditions only or correcting for the contribution of wind turbine noise following a recognised methodology.

10.3 Sensitive Receptors

175. The following noise and vibration sensitive receptors have been identified around the Site, at the following distances from the areas of the Site where turbines and associated infrastructure are to be built:

[52] *"Assessment and rating of noise from windfarms"* (ETSU-R-97), Energy Technical Support Unit

- Grubhill – isolated dwelling 1.7km to the west;
- Burnfoot – three dwellings 1.8km to the west;
- Glencorse – isolated dwelling 1.3km to the southwest;
- Ae – group of properties 1.5km to the southwest;
- Wood Farm – isolated dwelling 1.6km to the south;
- Lamphitt – isolated dwelling 980m to the south;
- Kirkland – isolated dwelling 880m to the southeast;
- Parkgate –group of properties 1km to the southeast
- Burrance and Blackacre – dwellings 680m to the southeast; and
  Carrick – isolated dwelling at 940m to the east.

176. These receptors have been identified from publicly available Ordnance Survey mapping. Postal address data will be obtained from the AddressBase Plus database and will be used to update the receptors to be assessed.

177. The AddressBase Plus data will also be used to identify any other receptors (e.g. those in closest proximity to other local windfarms) where a potential for cumulative effect is identified. Although Glenkiln is a property adjacent to the Site Boundary, it is owned by the Applicant and is derelict and so is therefore scoped out of assessment.

10.4 Mitigation

10.4.1 Construction Stage

178. There may be some upgrade works to the access road junction where it meets the A701. This junction is approximately 300m southwest from the Burrance dwelling identified above.

179. Should any onsite blasting be required for the winning of stone from on-site borrow pits, residents would be kept informed of the timescales and Best Practicable Means (BPM) would be employed.

180. For other construction works, including groundworks, turbine foundations, and installation of the turbines themselves, BPM would be employed at all times, and the distance would provide significant attenuation of any construction-related noise.

10.4.2 Operational

181. There is flexibility in the selection of the final proposed turbine locations, allowing substantial attenuation due to distance. Furthermore, other design approaches are available for use to reduce potential operational noise impacts to within appropriate limits if required.

10.5 Issues Scoped Out

10.5.1 Construction Phase Aspects

182. No new access routes are to be constructed as the Site will be accessed via the existing Harestanes access road. Any improvement works to existing tracks are likely to be minor and would be at least 300 m from the identified residential receptors. Assessment of construction noise and vibration from access road works is therefore scoped-out of the assessment.

183. Road junction improvement works would be limited to the junction between the existing Harestanes access road and the A701. The distance from this location to the nearest houses is at least 300m. Assessment of construction noise and vibration from off-site junction improvements is therefore scoped-out of the assessment.

184. The area where windfarm infrastructure is to be installed is well removed from local dwellings, significantly greater than 300m. As such, noise and vibration from construction works associated with the turbine foundation and installation works etc. will be significantly attenuated by distance alone. Assessment of construction noise and vibration from turbine construction is therefore scoped-out of the assessment.

185. With regards to construction traffic noise, the Site is anticipated to be accessed from the existing operational Harestanes Windfarm access road which is at least 300m from any residential receptors and is accessed directly from a main road (A701) which avoids the need to use local roads where baseline traffic flows might otherwise be relatively low. Construction-related vehicles would therefore not increase traffic flows on the A701 sufficiently to give rise to a significant noise level increase. Assessment of construction traffic noise is therefore scoped-out of the assessment.

10.5.2 Operational Phase

186. Once operational, development generated road traffic will be extremely low and unlikely to cause significant noise impact. Assessment of operational phase traffic noise is therefore scoped-out of the assessment.

187. The Proposed Development will connect to the operational Harestanes substation and therefore no new fixed plant is proposed. Assessment of fixed plant noise is therefore scoped-out of the assessment.

10.6 Likely Significant Effects

The Proposed Development could give rise to the following impacts with the potential to cause significant effects:

- Noise, vibration and air overpressure from blast work at the proposed borrow pit(s) (if required), on existing local receptors; and
- Operational turbine noise on local receptors.

10.7 Assessment Methodology

10.7.1 Noise, Vibration and Air Overpressure from Blasting at Borrow Pits

188. The locations or means of excavation for borrow pits have not yet been determined, so the potential for noise, vibration and overpressure effects remains open at this stage.

189. The potential for blast-induced noise, vibration and air overpressures will be considered using the guidance in BS 5228-2:2009+A1:2014[53]. This assessment will consider the likelihood of impacts arising with reference to the location of any proposed onsite borrow pits, and the mitigation measures that would be available for incorporation into the working methods.

190. Where required, appropriate noise and vibration mitigation measures will be presented, and residual effects will be determined.

10.7.2 Operational Turbine Noise

191. The assessment of operational turbine noise will follow the guidance in ETSU-R-97 and the IOA Good Practice Guide[54], as required by Dumfries and Galloway Council[55] and the Scottish Government[56], and will include the cumulative noise impacts of existing nearby windfarm developments.

10.8 Limitations and Assumptions

192. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The turbine to be installed would be the subject of a tender process which will not commence until after consent. The operational noise assessment will therefore be based on the noise emission data for a candidate turbine type that fits within the proposed physical parameters (e.g. max tip height, site conditions etc.).
- The operational cumulative noise assessment shall draw upon the latest information available for each of the identified windfarm developments, but it should be noted that this could be subject to change up to the cut-off date for including further cumulative developments, which will be agreed with Dumfries and Galloway Council during consultation.

Question 12

Do you agree with the Noise proposed approach for baseline collection, prediction of effects and significance assessment?

[53] BS 5228-2:2009+A1:2014 "*Code of practice for noise and vibration control on construction and open sites. Vibration" and Planning Advice Note 50 "Controlling the environmental effects of surface mineral workings*".
[54] *A good practice guide to the application of ETSU-R-97,* Institute of Acoustics
[55] *"Local Development Plan 2 Wind Energy Development: Development Management Considerations"* (adopted February 2020).
[56] *Assessment of noise: technical advice note (*3 March 2011), Scottish Government

11 Traffic and Transport

11.1 Consultation

193. No consultation pertaining to Traffic and Transport has been undertaken to date. The following local authorities and statutory bodies will be consulted to provide opinion on the scope and method of assessment proposed for the Traffic and Transport chapter:

- Dumfries and Galloway Council; and
- Transport Scotland.

194. The following additional stakeholders will be consulted as a minimum, with regards to the suitability of the proposed access routes for both general construction traffic and abnormal load vehicles:

- Scotland Transerv (South West);
- Amey (South East);
- Police Scotland; and
- Network Rail.

11.2 Baseline Conditions

195. To establish baseline traffic flows, data will be obtained from the Department for Transport (DfT) and/or Dumfries and Galloway Council for the most recently available period (2018). Annual average daily flow (AADF) information will be obtained for the agreed study network, which will confirm the traffic levels including light goods vehicles (LGV) and heavy goods vehicles (HGV) along the routes. These figures will be combined with the forecast levels of construction traffic, in order to identify the impact of the Proposed Development on the study network.

196. It is requested that Dumfries and Galloway Council provide information on any 'committed' developments deemed relevant to be included within the base traffic flow data, for inclusion within the study.

197. The Study Area for the purposes of the Traffic and Transport chapter has been defined as the public road network in the vicinity of the Proposed Development, which will be used by vehicles to access the Site for construction activities. It is proposed that the following road sections will form the Study Area:

- A75(T) – between the junction with the A76 and the A709; and
- A701(T) – between the junctions with the A75(T) and the A74(M).

198. Effects associated with traffic generated by the Proposed Development will be most pronounced in close proximity to the site access. As vehicles travel away from the Proposed Development, they will disperse across the wider road network, thus diluting any potential effects. It is therefore expected that the effects relating to Traffic and Transport are unlikely to be significant beyond the study area identified above.

199. In relation to abnormal loads associated with the construction of the Proposed Development, access could be taken from a number of Ports of Entry (POE), such as Glasgow KGV Docks. Existing studies have already been undertaken by the Applicant in this regard, with a detailed route assessment being undertaken from Glasgow KGV Docks. The proposed access route currently under consideration based on these studies and proposed for inclusion within the Traffic and Transport chapter is as follows:

- Glasgow KGV Docks
- Kings Inch Drive
- M8
- M74/M6
- A75
- A701
- Site Road

200. A secondary port option using the port of Cairnryan is also considered. This port is significantly smaller and improvement works to the road network from the port gate to the A714 access junction will be required. In addition, the Port of Cairnryan

has some restrictions including limited water depth and port handling facilities/component storage and may limit the use of this facility.

201. Access from Cairnryan would be via the A77, A751, A75 and A714.

11.3 Sensitive Receptors

202. The following sensitive receptors have been identified along the proposed access routes:

- A75 / A709 roundabout – Tarff Town and Country shop and stand-alone properties (farms); and
- A701 – Visitor attractions, recreational attractions, residential properties (developments and stand-alone), medical centre, churches, local primary schools (Locharbriggs Primary School and Amisfield Primary School), village hall, nursery, local library, care home and Regional Cycle Network Route 10.

203. The sensitivity of the receptors identified on the proposed access routes will be evaluated in relation to potential impacts of both general construction traffic and abnormal load traffic, with mitigation measures proposed, where appropriate.

11.4 Mitigation

204. The results of the assessment will determine the appropriate mitigation measures for the protection of any sensitive receptors identified that are likely to be significantly affected by the construction of the Proposed Development. Mitigation, where appropriate, will be identified and embedded into the design of the Proposed Development, in particular, tasks associated with moving large quantities of materials to the Site. Measures proposed will be incorporated into the outline Construction Traffic Management Plan (CTMP) which will be included within the EIA Report.

11.5 Issues Scoped Out

205. When compared to the construction phase, the traffic impacts associated with the operational phase will be very low with one or two small service vehicles regularly accessing the site to carry out routine maintenance on the turbines. As this is an extension to an existing windfarm it is not considered that the operational movements would be much greater than already taking place for operational Harestanes Windfarm. Therefore, further assessment of the traffic impacts of the Proposed Development during the operational phase is not considered necessary.

11.6 Likely Significant Effects

206. Any effects are expected to occur only during the construction phase and be temporary in nature. Notwithstanding this however, a number of mitigation measures will be proposed and included in the CTMP to help reduce the effects of both abnormal load movements and general construction traffic on the surrounding road network during the construction phase.

11.7 Assessment Methodology

207. In line with the Environmental Assessment guidance (IEA,1993)[57], the following criteria will be adopted to identify whether links on a network should be subject to detailed assessment:

- Include traffic links where either traffic flows would increase by more than 30% or the number of HGV movements would increase by more than 30% as a result of the development; and
- Include any other specifically sensitive location affected by traffic increases of at least 10%.

208. The following groups and special interests will be assessed for each link on the agreed study network in line with the IEA guidance, to determine the sensitivity of receptors:

- people at home;
- people at work;
- sensitive locations – including hospitals, schools, places of worship and historical buildings;
- people walking;
- people cycling;
- recreational and shopping areas;
- ecological / nature conservation sites; and

[57] *Institute of Environmental Assessment (IEA), The Guidelines for the Environmental Assessment of Road Traffic (1993).*

- tourist / visitor attractions.

209. In addition to the traffic impact on the study network, the following effects will be assessed in accordance with the IEA guidance methodology:

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

210. The significance of the effects on receptors will be evaluated against the IEA guidance and where possible, in line with the criteria used for the other environmental topic areas covered in the EIA. These criteria are subjective but consider the number of receptors affected, their sensitivity and the length of the period for which they will be impacted.

211. A number of the traffic-related effects set out in the IEA guidance such as noise, vibration and ecological effects are out with the scope of this assessment and will be assessed in the respective chapter of the EIA Report.

212. With regards to general construction traffic, in order to assess the traffic impacts during the construction phase, estimated vehicle movements for all major construction vehicle trip generators will be calculated. Where information is available these will be based on site-specific information and the turbine manufacturer's construction guidelines.

213. The daily vehicle movements during the peak period of the construction phase will be assessed against the baseline traffic conditions. Any changes in traffic levels on each of the study network links during the construction phase will be assessed in terms of percentage change and compared against the maximum vehicle capacity of each link.

214. As part of the assessment, we will carry out an electronic service delivery for abnormal loads (ESDAL) review and consult with all relevant roads authorities and asset managers to confirm the suitability of the structures on the proposed turbine component delivery routes to accommodate the proposed abnormal loads.

215. The assessment will consider Transport Scotland's Transport Assessment Guidance (2012) as appropriate.

11.8 Limitations and Assumptions

216. The scoping exercise in relation to identifying sensitive receptors has been based on a desk-based exercise only. Should the Local Authority be aware of any specific sensitive receptors not included, we would be grateful if these could be advised accordingly. With regard to the sourcing of materials in relation to the construction of the Proposed Development, the contractors and suppliers are unlikely to be known at the EIA stage and so it is not possible to confirm with certainty which routes will be used by development traffic, and how much traffic will utilise each route. Therefore, worst-case assumptions of assigning all construction traffic to each route will be made (unless agreed otherwise with the Local Authority).

217. Any other limitations or assumptions made in the preparation of the Traffic and Transport chapter will be clearly stated in the EIA Report.

Question 13

Do you agree with the Traffic and Transport proposed approach for baseline collection, prediction of effects and significance assessment?

12 Socio-Economics, Recreation, and Tourism

12.1 Consultation

218. At this stage of the project, no consultation has been undertaken in relation to the socio-economic, recreation and tourism assessment. It is anticipated that ScotWays will be contacted to confirm the number and location of any Public Rights of Way (PRoW) as part of the EIA. British Horse Society, Mountaineering Scotland, Visit Scotland and the community councils will be consulted as part of the wider consultation.

12.2 Baseline Conditions

12.2.1 Socio-economic

219. The 'local level' Study Area for the socio-economic assessment comprises the administrative boundary of Dumfries and Galloway Council. Scotland comprises the 'regional level' Study Area for the assessment of socio-economic impacts.

220. The 2018 Office of National Statistics (ONS) population estimate for Dumfries and Galloway[58] was 148,800 and 5,438,100 for Scotland. The working population with people aged 16 to 64 in Dumfries and Galloway is 87,500 (58.8%), which is lower than Scotland (64.2%) and National (62.7%) averages. Overall, the data shows that the proportion of total employees across industry sectors in the Study Area are broadly in line the national average.

221. There are scattered properties and three small-scale settlements located in proximity to the Site Boundary. These include:

- Ae located immediately to the southwest;
- Parkgate located approximately 1km to the southeast; and
- Amisfield located approximately 5km to the southeast.

222. The Forest of Ae is a commercial forestry with Adrenalin Uplift providing paid mountain bike uplift and private bike hire services.

12.2.2 Recreation

223. The recreation assessment will focus on a 5km Study Area, in order to capture the receptors most likely to be affected by the Proposed Development.

224. There are existing formal and informal recreation facilities and activities within Forest of Ae including:

- Core paths
  - Ae Forest Large Circular (within the Site Boundary);
  - Dalswinton to Ae (approximately 800m west of the Site Boundary); and
  - Closeburn to Moffat (approximately 1.8km north of the Site Boundary).
- Forestry and Land Scotland Trails
  - Ae Naze Trail (within the Site Boundary);
  - Water of Ae Riverside Trail (approximately 350m west of the Site Boundary);
  - Green Hill Trail (approximately 350m west of the Site Boundary).
- Romans and Reivers Long Distance Route (within the Site Boundary)
- Ae 7Stanes Mountain Bike Trails;
- Forest Road – Roads within Forest of Ae (within the Site Boundary);
- Ae Bike Shop and Café (approximately 560m southwest of the Site Boundary);
- Forest of Ae car park (approximately 560m southwest of the Site Boundary);
- Beattock Drove Roads, Forest of Ae heritage path (approximately 500m west of the Site Boundary);
- Sustrans Regional Cycle Route No.10 (within the Site Boundary);
- Locharbriggs-Beattock local cycle route (within the Site Boundary); and
- It is understood that deer stalking is undertaken within the Site Boundary.

[58] NOMIS (2018), Local Authority Profile - Dumfries and Galloway. Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157410/report.aspx (Accessed: 27 February 2020)

225. There are other paths located within the wider Recreation Study Area including:

- Daer Water to Kirkpatrick heritage path (approximately 3.4km northwest of the Site Boundary);
- The Annandale Way Long Distance Route (approximately 3km east of the Site Boundary);
- Core paths
  - Barony to Parkgate (approximately 1.8km southeast of the Site Boundary); and
  - Annandale Way (approximately 3km east of the Site Boundary).

226. No PRoW have been identified during this stage of the project, however ScotWays will be consulted as part of the EIA to gain an understanding of PRoW within the Study Area.

12.2.3 Tourism

227. The tourism assessment will focus on a 15km Study Area, in order to capture the receptors most likely to be affected by the Proposed Development.

228. Tourist facilities and attractions identified at this stage of the project include:

- Drumlanrig Castle (approximately 15km northwest);
- Dumfries and Galloway Aviation Museum (approximately 10.5km south);
- Morton Castel (approximately 11.6km northwest);
- Closeburn Castle (approximately 7.9km west); and
- Dalscone Farm Fun (approximately 11km south).

229. Tourist accommodation has been identified within:

- Ae (immediately to the southwest of the Site Boundary);
- Thornhill (approximately 11km northwest);
- Closeburn (approximately 8.5km west);
- Auldgrith (approximately 7.7km southwest);
- Dumfries (approximately 13km south); and
- Moffat (approximately 12km northeast).

12.3 Sensitive Receptors

230. The sensitive receptors identified for socio-economics comprise Dumfries and Galloway economy; Scotland economy; the UK economy; and Forest of Ae as a commercial forestry.

231. Recreation sensitive receptors are as detailed in the baseline section above.

232. Tourism sensitive receptors comprise tourist attractions and tourist accommodation.

12.4 Mitigation

12.4.1 Socio-economics

233. It is anticipated that a Construction Method Statement (CMS) would be prepared by the construction contractors and agreed with Dumfries and Galloway Council prior to the commencement of the construction works. The CMS would include measures for the construction contractor to provide employment opportunities in the local area. The EIA Report will also identify, if required, mitigation with respect to mountain bike business within the Study Area. Mitigation relating to commercial forestry operations would be informed by the Forestry assessment as part of the EIA.

12.4.2 Recreation and Tourism

234. The CMS would also include public notices that would be issued prior to the construction and maintenance works to inform local residents, recreational users and businesses of dates and durations of the works. During construction and maintenance, it is anticipated that access would be temporarily restricted for areas surrounding works and that alternative paths or access routes would be provided where possible.

12.4.3 Community Benefits

235. The Applicant has made substantial investment in southwest Scotland and currently owns and operates four windfarms in the D&GC region (Wether Hill, Harestanes, Ewe Hill, Glen App and Kilgallioch Windfarms). Through their established presence in Dumfries and Galloway, they have to-date, contributed over £7,000,000 in community benefits, with in the region of £30,000,000 committed during the operational lifetime of these existing assets. These funds contribute to a variety of groups and organisations to assist them in delivering projects which they have identified as having benefit to those living, working or visiting the surrounding area. It is expected that the Proposed Scheme would establish a community benefit arrangement with local communities which may include an opportunity for the community to invest in the operational windfarm.

12.5 Issues Scoped Out

236. No aspects of the socio-economic, recreation and tourism assessment are proposed to be scoped out of the EIA.

12.6 Likely Significant Effects

237. The development has the potential to have both beneficial and adverse effects on socio-economics, recreation and tourism.

12.6.1 Socio-economics

238. The Proposed Scheme would have beneficial effects on socio-economics. These beneficial effects would be direct (i.e. generation of direct employment opportunities), indirect (e.g. employment opportunities generated down the supply chain) and induced (e.g. employment created additional spend of wages). The Proposed Scheme would generate jobs in the local community and a regional scale during the construction and operation of the Proposed Development. It should be noted that the jobs generated would be green jobs and the Proposed Scheme would contribute towards low cost energy generation.

239. There is the potential for temporary direct adverse impacts on commercial businesses located within the Forest of Ae, including services provided by Adrenalin Uplift and Ae Café and Bike Shop, if recreational trails are temporarily closed during construction and maintenance.

240. The Proposed Scheme could have direct and indirect adverse impacts on commercial forestry operations at the Forest of Ae due to the loss of or reduced viability of the forestry.

12.6.2 Recreation

241. There is the potential for temporary adverse effects on access to recreational facilities and activities during the construction and operation (during maintenance works) of the Proposed Development. This is because the areas surrounding construction and maintenance activities could be temporarily restricted, and access to recreational facilities and activities may be adversely affected by construction traffic and activities. The Proposed Development could also have an adverse effect on amenity experienced by users of the recreational facilities and activities. For the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of the recreational facilities and activities. Improved access arrangements for recreation purposes will be considered as part of the Proposed Development, which could result in a beneficial effect.

12.6.3 Tourism

242. There is the potential for temporary adverse effects on tourism during the construction and operation (during maintenance works) of the Proposed Development. The construction and operation of the Proposed Development could affect accessibility and amenity of the tourist attractions (e.g. Forest of Ae recreational activities) and tourist accommodation. Improved access arrangements for tourist attractions will be considered as part of the Proposed Development, which could result in a beneficial effect.

12.7 Assessment Methodology

243. There is no established guidance for conducting a socio-economic, recreation and tourism assessment as part of the EIA process. It is proposed that the assessment methodology is assessed upon professional judgement from experience on similar projects and uses desk-based information and field notes/photographs taken during surveys at the Site.

244. A review of local, regional and national socio-economic, recreation and tourism planning policies, legislations and strategies will be undertaken and considered as part of the EIA.

245. Socio-economic, recreation and tourism effects will be assessed for both the construction and operational phases of the Proposed Development.

246. The level of significance of an effect will take into consideration the sensitivity of the receptor and the magnitude of an impact. Specific values in terms of sensitivity will not be attributed to the resources/receptors due to their diversity in nature and scale, however the assessment instead takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, on their ability to respond to change. The magnitude of impact will consider the size of the impact on receptors in the context of the area in which the effects will be experienced. The effects will be described as either beneficial, negligible or adverse.

247. The Landscape and Visual, Noise, Traffic and Transport and Forestry assessments will inform the assessment of effects for recreational facilities and activities as well as tourist attractions in the Study Area.

12.7.1 Socio-economics

248. Regional employment statistics will be reviewed, and settlements will be identified and described using sources such as the National Online Manpower Information System (NOMIS) and the Scottish Index of Multiple Deprivation. A quantitative assessment of the generation of employment opportunities, spend per annum and GVA during construction and operation will be calculated based on the RenewableUK research[59] assumptions and the scale and size of the Proposed Development. Consideration will be given to the fact that the Proposed Development is an extension of an existing windfarm and there will already be workers employed to maintain the existing windfarm.

249. The RenewableUK research assumptions include:

- on average, the construction value would be £1.32 million per MW installation capacity;
- on average, there is one employee per £137,942 in turnover and a Gross Value Added (GVA) or turnover rate of 0.432;
- on average, the operation and maintenance value would be £59,867 per MW installed per annum; and
- on average, the turnover per employee is £121,935 and the GVA / Turnover rate is 0.430.

250. The assessment will also take into consideration the 'Economic benefits from onshore windfarms' research undertaken by BVG Associates[60].

251. A qualitative assessment will be undertaken to consider the potential effects of any required temporary closures to recreational trails in the Forest of Ae on commercial businesses.

252. A qualitative assessment considering the potential effects of the loss or reduced viability of the Forest of Ae commercial forestry operations will be undertaken and will be informed by the Forestry assessment undertaken as part of the EIA.

12.7.2 Recreation

253. The EIA will include a qualitative assessment of the effect of the Proposed Development on informal and formal recreation facilities and activities, including designated routes, within 5km of the Site Boundary. The assessment will be undertaken based on the changes in accessibility (worsened or improved), severance and amenity, on the recreational receptors during construction and operation of the Proposed Development. As outlined above, for the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of the recreational facilities and activities.

12.7.3 Tourism

254. A review of national and regional tourism strategies and visitor statistics will be undertaken for the Study Area. Key visitor attractions and facilities within 15km of the Site Boundary will be identified using publicly available sources, such as the VisitScotland website[61]. A qualitative assessment will be undertaken based on the changes in accessibility, severance and amenity on tourist receptors (tourist attractions and tourist accommodation) during the construction and operation of the Proposed Development. For the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of the tourist attractions. A qualitative assessment of the impacts of the

[59] RenewableUK (2015) Onshore Wind: Economic Impacts in 2014
[60] BVG Associates (2017) Economic benefits from onshore wind farms
[61] Visit Scotland. Available at: https://www.visitscotland.com/

Proposed Development on visitors' decisions to holiday in the Study Area will be undertaken based on Scotland specific research, such as the Visit Scotland Position Statement[62].

12.8 Limitations and Assumptions

255. Baseline data will be collected through a desk-based study using publicly available sources and field notes and photos.

Question 14

Do you agree with the Socio-Economics, Recreation, Tourism proposed approach for baseline collection, prediction of effects and significance assessment?

13 Other Issues

13.1 Introduction

256. An 'Other Issues' chapter will be included in the EIA Report and will contain the assessments of the potential impacts of the Proposed Development from other issues which are not covered in other technical disciplines.

257. This section of the document sets out the proposed approach in respect to the 'other issues' assessments that are required in order to provide a comprehensive assessment of the likely environmental impacts of the Proposed Development. Other issues which are considered and subsequently discussed in this section include:

- Forestry and Land Use;
- Aviation and Radar;
- Eskdalemuir Seismic Array;
- Telecommunications;
- Air, Climate and Carbon Balance;
- Shadow Flicker;
- Population and Human Health;
- Major Accidents and Disasters; and
- Material Assets.

13.2 Forestry and Land Use

13.2.1 Consultation

258. At this stage, it is anticipated that the main consultee will be Scottish Forestry (SF), South Scotland Conservancy. SF will be consulted to ensure that the proposed changes to the woodlands address the requirements of the Scottish Government's Control of Woodland Removal Policy[63] and other guidance. In addition, there may be interrelated issues raised by other consultees and this will be set out in the EIA Report.

13.2.2 Baseline Conditions

259. The Proposed Development is located within the Forest of Ae which is owned by the Scottish Ministers and managed by FLS. The Forest of Ae is a long-established commercial forest created over an extended period of time which is into the production phase with ongoing felling and replanting. The Forest of Ae Composite Land Management Plan (LMP)[64] incorporates the forest blocks of Kirkland, Old Forest, Queensberry and Stiddriggs. The principal objective of the plan is continued timber production and maintaining the principle species as Sitka spruce. In addition, there are areas identified as "treasured" throughout the forest and these are of higher importance for landscape, habitat and biodiversity where timber production will be of lower importance. The current LMP expires in 2027.

260. A desk-based assessment reveals there are sections within the Site Boundary identified as core areas of the Native Woodland Integrated Habitat Network, though these areas are generally small and fragmented. The Native Woodland

[62] Visit Scotland (2014), Position Statement – Wind Farms. Available at: https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/policies/visitscotland-position-statement---wind-farms---oct-2014.pdf (Accessed: 06 March 2020)
[63] Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal. Edinburgh.
[64] Forestry and Land Scotland, Dumfries and Borders FD: Ae Composite Land Management Plan 2017 – 2027. Available at https://forestryandland.gov.scot/what-we-do/planning/active/forest-of-ae accessed on 24th February 2020.

Survey of Scotland (NWSS)[65] identifies these woodlands as ancient, of semi-natural origin, or as 'other' on the Roy Military Survey of Scotland map[66]. Further parts of the woodlands are classed as Primary and Secondary Zones under the Native Woodland Integrated Habitat Network, as potential areas for native woodland expansion.

261. A forestry baseline will be prepared which will detail the crops existing at the time of preparation of the EIA Report. This will include current species; planting year; felling and restocking plans contained within the existing LMP; and other relevant woodland information. It will be prepared from existing forest records; desk-based assessments; consultations with FLS; and field surveys.

13.2.3 Sensitive Receptors

262. The forestry assessment will be a factual assessment describing the changes to the forest structure resulting from the incorporation of the Proposed Development into the forest. The forestry report will be presented in a Technical Appendix. The effects of the Proposed Development related forest felling and restocking will be assessed in the relevant Chapters of the EIA Report, including Chapter 5: Landscape and Visual; Chapter 6: Ecology; Chapter 7: Ornithology; and Chapter 9: Hydrology, Hydrogeology, Geology and Peat.

13.2.4 Mitigation

263. Measures to avoid or mitigate potential impacts upon the forest will, as far as practicable, sought to be embedded in the design of the Proposed Development through consideration of the siting of the turbines and by using existing access tracks.

264. Potential forms of mitigation may include a redesign of the existing forest in consultation with FLS including, for example, changes to the felling programme; the use of designed open space; alternative species and woodland types; changing the management intensity; or the provision of compensation planting on or offsite.

13.2.5 Issues Scoped Out

265. The changes to the forest for a particular development are regarded as site-specific and it is considered that there are no cumulative onsite forestry issues to be addressed.

13.2.6 Likely Significant Effects

266. There is potential for changes to the forest structure resulting from the Proposed Development, with consequential implications for the wider felling and restocking plans across the forest area. Areas of woodland are anticipated to be required to be felled for the construction and operation of the Proposed Development including for access tracks, turbine locations and other infrastructure. The potential effects will be changes to the structure of the woodlands, which may result in a loss of woodland area.

13.2.7 Assessment Methodology

267. The forestry assessment will be limited to the forest area contained within the approved Forest of Ae Composite LMP. A Windfarm Forest Plan will be prepared, which will detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the Proposed Development. This will include a felling plan to show which woodlands are to be felled and when for the construction and operation of the Proposed Development. It will further include a restocking plan showing which woodlands are to be replanted and with which species.

268. The changes to the woodland structure will be analysed and described including changes to the woodland composition, timber production, traffic movements and the felling and restocking plans. The resulting changes to the woodland structure will be assessed for compliance with the UK Forestry Standard[67] and the requirement for compensation planting to mitigate against any woodland loss will be identified. The Windfarm Forest Plan will be assessed against the baseline data in line with the Control of Woodland Removal Guidance[68].

[65] The Native Woodlands Survey of Scotland, available at https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18 accessed on 24th February 2020.
[66] Roy Military Survey of Scotland 1747-1755. National Library of Scotland. Available at: https://maps.nls.uk/roy/
[67] Forestry Commission (2017). The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission, Edinburgh.
[68] Forestry Commission Scotland (2019): Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal. Available at accessed on 24th February 2020.

13.2.8 Limitations and Assumptions

269. This section of the Scoping Report has been prepared from a desk-based assessment only. No consultations or field surveys have been carried out. It has been assumed that there have been no major changes to the approved Forest of Ae Composite LMP.

13.3 Aviation and Radar

270. The development of wind turbines has the potential to cause a variety of adverse effects on aviation during turbine operation. These include physical obstructions, generation of unwanted returns on Primary Surveillance Radar (PSR), and adverse effects on overall performance of CNS (Communication, Navigation and Surveillance) equipment.

271. Lowther Hill PSR is approximately 22km northwest of the site, and this is an en-route radar operated by NATS (En Route). Preliminary online data from NATS shows that some of the Proposed Development's turbines may be visible to this radar. Carlisle Airport is approximately 57km to the southeast, Prestwick Airport is approximately 73km northwest, Glasgow Airport is approximately 92km northwest and Edinburgh Airport is approximately 83km north, although the Proposed Development is not within any of their statutory safeguarding areas. The site is within MOD Tactical Training Area 20, the turbines may be in radar line of sight of MOD PSR at RAF Spadeadam but the Proposed Development is over 35k outside the Spadeadam Range and over 1nm from the A701, the most likely line feature for MOD low flying activities.

272. An assessment of civil and military aviation issues will be undertaken, including radar line-of-sight assessment and detailed airspace analysis by specialist consultants. Should issues be identified that require mitigation, consideration of potential mitigation options shall be included.

13.4 Eskdalemuir Seismic Array

273. The Proposed Development is within the 50km MOD consultation zone for the Eskdalemuir Seismic Monitoring Array, the turbines being between 27-30km from the centre of the Array. At present, the MOD has allocated all extant seismic ground vibration for the Array and can be expected to object to the Proposed Development on Eskdalemuir safeguarding grounds. However, work is ongoing under the auspices of the Scottish Government to review the safeguarding algorithm under which seismic budget is allocated, investigating the opportunity to extend the "no build" zone form 10km to 15km and to determine if new turbines are more seismically quiet than older turbines. An update on this work will be provided in the EIA.

13.5 Telecommunications

274. Telecommunication systems use a variety of electromagnetic (EM) signals, commonly described as radio waves. Uses primarily include television (TV); radio; mobile telephony; microwave communications; and, radar. Interference of EM signals can cause distorted sound, image or data transmission and can potentially occur when existing telecommunication systems are not adequately considered during a windfarm's design and development.

275. The study area will comprise the Site and the wind turbine locations. Only EMI and telecommunications links which travel across the site and close to the wind turbine locations will be impacted by the Proposed Development and therefore there is no need to widen the study area.

276. The assessment of potential telecoms and electromagnetic interference requires consultation through Spectrum, the Ofcom department for managing civilian use of the radio spectrum. Details or links operated in the area will be obtained, the point location details will then be requested from the operator to be mapped in GIS. There is general guidance provided by different link operators on separation distances that need to be maintained. If there is potential for one or more wind turbines to be located within the specified distances we will engage with the operator to discuss any mitigation that may be required.

277. Initial consultation has been undertaken with Ofgem who confirmed that there are two telecommunications links across the site, along with an onsite mast. The locations of these links and masts, and appropriate buffers will be factored into the windfarm design to embed mitigation and avoid potential impacts. Further consultation will be undertaken through the EIA to update this baseline information and inform the assessment.

278. TV interference is now considered to be low risk due to analogue TV signals no longer being in use and so this aspect is proposed to be scoped out of the assessment. In the unlikely instance that TV interference occurs, it is considered that this can be appropriately covered by a suitably worded planning condition and complaints procedure to implement any necessary mitigation.

13.6 Air, Climate and Carbon Balance

279. The Site is not located near an Air Quality Management Area and operational emissions to air, water and soil are anticipated to be negligible given the nature of the Proposed Development. The only appreciable emission to air caused by the Proposed Development would be emissions from construction traffic. However, given the rural nature of the routes to be used and that the levels of pollution in the background air quality are low, construction of the Proposed Development is not considered to lead to sufficient traffic levels to have the potential for air pollution levels approaching any relevant limit values. The CEMP will contain standard industry best practice mitigation regarding emissions during construction and therefore no significant air quality effects are anticipated. It is therefore proposed that an assessment of air quality impacts is scoped out of the EIA.

280. The Proposed Development will reduce demand for fossil fuel electricity generation and will support the transition to a low carbon energy system, as described in Section 2.1 of this report. Although there will be a small amount of greenhouse gas emissions associated with construction activities and embedded in the construction components, operational emissions are anticipated to be negligible.

281. The design of the Proposed Development will comply with guideline flood return periods including climate change allowances and flood risk will be considered in the EIA as discussed in section 9 of this report. Other factors such as extremes of temperature, storms, and drought have been considered as part of Major Accidents and Disasters discussed in Section 13.7 and no significant effects are likely. It is therefore proposed that an assessment of Climate is scoped out of the EIA.

282. The Scottish Government uses an assessment of the carbon impact of windfarm development to support the process of determining windfarm developments in Scotland. This is particularly relevant in peatland areas where there can be substantial carbon losses due to disturbance to peat, which can in part off-set the benefit of wind energy on carbon emissions.

283. The carbon balance assessment is a desktop assessment comparing the carbon losses of windfarm construction with the ongoing savings of green electricity production to estimate the reduction in carbon emissions expressed as a breakeven or “payback” timescale. It is based on the methodology within Calculating Carbon Savings from Wind Farms on Scottish Peatlands, Nayak et al 2008, with subsequent updates. The calculations contain expected values but also upper and lower bound values. Within the parameter set, there are several site-specific options and it is important the appropriate choices are made and can be justified within the supporting report.

284. The Scottish Government has an on-line Carbon Calculator Tool (latest version 1.6.0)[69] for the purpose of carbon balance assessment which will be used for this project in conjunction with the guidance provided in Scottish Government, SNH and SEPA’s Peatland Survey - Guidance on Developments on Peatland – 2017 document[70].

285. The iterative conceptual design will seek to avoid deep peat and minimise peat disturbance, in order to achieve a more favourable carbon balance assessment.

13.7 Shadow Flicker

286. The term “Shadow Flicker” refers to the flickering effect caused when rotating wind turbine blades periodically cast shadows over nearby properties. Shadow flicker can only occur inside a property and under a certain set of conditions including bright sunshine, the wind turbines are operational and that the sun is in a particular location to cast a shadow from the wind turbines across a property.

287. The Scottish Government’s “Onshore wind turbines: planning advice”[71] and industry standard guidelines[72] state that shadow flicker is unlikely to be of a significant impact at distances greater than ten rotor diameters from a turbine. Therefore, for this

[69] Scottish Government (2018) Carbon calculator for wind farms on Scottish peatland: factsheet [online]. Available at: https://www.gov.scot/publications/carbon-calculator-for-wind-farms-on-scottish-peatlands-factsheet/. Accessed 6th March 2020.
[70] Scottish Government, SNH and SEPA (2017) Guidance on developments on peatland: peatland survey [online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf.
[71] https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/
[72] Parsons Brinckerhoff Consultants on behalf of DECC (2010) Update of UK Shadow Flicker Evidence Base

project the study area which will be assessed for potential shadow flicker impact will be an area around each of the wind turbine locations of ten times the rotor diameter of the candidate wind turbine. Once the final turbine layout and candidate wind turbine are fixed, the locations of residential properties which are within this study area will be determined and a shadow flicker model will be run to predict the potential impact on these properties. For this assessment a worst-case scenario based upon the following assumptions will be used to determine the maximum potential impact due to shadow flicker at each of the residential properties:

- There is direct sunlight during all daylight hours;
- All the turbines are visible from each location (no screening);
- The wind turbines are always operating; and
- The wind is always aligned with the sun (the turbine rotor casts the maximum possible shadow).

288. If no properties are located within ten times the rotor diameter from the wind turbine locations then this will be evidenced in the EIA and shadow flicker will be scoped out of the assessment.

289. To date, no consultation has been undertaken regarding shadow flicker and none is expected to be required for the EIA assessment.

290. If the impacts assessed in the EIA require mitigation then there are a number of highly effective mitigation measures available. For example, screening in the form of an appropriate hedge or similar and appropriate wind turbine control modules to inhibit the conditions required for shadow flicker to occur.

13.8 Population and Human Health

291. The Proposed Development will be designed and maintained in accordance with relevant industry guidelines, standards and regulations including those pertaining to safeguarding the risk to human health. This includes siting the turbines with sufficient buffers from sensitive receptors, such as the forestry tracks and mountain bike trails, to minimise the risk of human health impacts during operation. Risks associated with ice build-up, lightning strike and structural failure will be removed or reduced through technology inherent in the turbine mechanisms.

292. The distance to the nearest residential receptors and that construction traffic will use the access route used for the operational Harestanes windfarm, although some alternations to existing or new tracks might be required, these are not considered to present a significant risk to human health.

293. Given the absence of likely significant effects, all assessment of effects on population and human health are proposed to be scoped out of the EIA.

13.9 Major Accidents and Disasters

294. A review was undertaken of the potential effects deriving from the vulnerability of the Proposed Development to risks of major accidents and disasters.

295. An initial list of major accidents and disasters was compiled using a variety of sources including the Cabinet Office National Risk Register of Civil Emergencies 2015 Edition[73] and UK Government Emergency Response & Recovery Guidance[74]. This list was screened in two stages to identify risks which would be applicable to the Proposed Development; firstly based on the location and use/nature of the Proposed Development; and then based on the likelihood of the event and consequence of the outcome. The final screened list was then considered in terms of existing mitigation or prevention measures such as regulations and guidance.

[73] National Risk Register of Civil Emergencies. 2015. Cabinet Office. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/419549/20150331_2015-NRR-WA_Final.pdf
[74] Emergency Response and Recovery, Non statutory guidance accompany the Civil Contingencies Act 2004. 2013. HM Government. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/253488/Emergency_Response_and_Recovery_5th_edition_October_2013.pdf

296. Flood risk and peat slide will be addressed in the Hydrology, Hydrogeology, Geology and Soils assessment of the EIA.

297. This review did not identify potentially significant effects from major accidents or disasters that would require assessment under the EIA Regulations and therefore this topic has been scoped out of the EIA.

13.10 Material Assets

298. Considering the nature and scale of the Proposed Development, significant effects on material assets are not anticipated. The manufacturing or construction of the Proposed Development is not anticipated to result in significant use of primary or secondary materials; existing access tracks will be used as far as practicable and borrow pits, if required, will be sought on-site to avoid the need to import materials. There would be negligible waste generation during construction and this would be minimised through controls to minimise material use and waste generation which will be contained in the CEMP. During operation, material resource use and waste generation are anticipated to also be negligible and concern routine maintenance of the turbines only. As such, it is therefore proposed that this topic be scoped out of the EIA Report.

Question 15

Do you agree with the proposed approach for baseline collection, prediction and significance assessment for the following topics:

- Forestry and Land Use
- Aviation and Radar
- Eskdalemuir Seismic Array
- Telecommunications
- Air, Climate and Carbon Balance
- Shadow Flicker
- Population and Human Health
- Major Accidents and Disasters
- Material Assets

14 Topics "Scoped Out"

299. As explained above, a number of topics, or aspects of topics, are considered to not be applicable or are unlikely to give rise to significant effects and are therefore proposed to be scoped out from further consideration within the EIA.

300. Table 14.1 below lists each topic and the elements to be scoped in and out from the EIA; with a brief justification for doing so.

Table 14.1 Issues Scoped In and Out

Topic	Scoped In	Scoped Out
Landscape and Visual	• **LVIA** - supported by wirelines and photomontages from the agreed viewpoint locations. • **CLVIA** - given the Proposed Development is an extension to Harestanes Windfarm and in close proximity to several windfarms. • **RVAA** – as residential properties are nearby • **Lighting Assessment** - will be over 150m to tip height, they will require aviation lighting	• **Certain LCT will be scoped out -** that do not have any or very minimal potential visibility, or those with potential visibility will be scoped out if a combination of distance and intervening landscape cover and built form (not included within the ZTV model) reduces the potential for any significant effects. • **Landscape Designations -** Due to the distance from the Proposed Development, minimal potential visibility illustrated on the ZTV (Figure 5.3) and also qualities which relate to

Topic	Scoped In	Scoped Out
		aspects or views unrelated to the Site, eight landscape designations are proposed to be scoped out: • **Visual Receptors** The following visual receptors will be scoped out due to none or limited potential visibility: residents in Sanquhar; residents in Auldgirth; residents in Leadhills; and recreational and marine receptors within the Solway Firth
Ecology	• **Habitats on Site including bog and GWDTE** - the Site includes potentially sensitive habitats; • **Otters** - the Water of Ae and other burns connected to the Water of Ae are present across the Site and adjacent terrestrial habitat potentially used by otters; • **Water vole** – the site crosses several drains, ditches and burns potentially utilised water vole; • **Red squirrel** - the Site contains coniferous woodland habitat potentially utilised by red squirrel for shelter and foraging; • **Pine marten** - the Site contains coniferous woodland habitat potentially utilised by pine marten for shelter and foraging; • **Badger** – the Site contains potential sett creation habitat within the woodland; • **Bats** – the Site crosses woodland habitat potentially utilised by bats for foraging, commuting or roosting; • **Fish** – the Site crosses watercourses connected to the Water of Ae potentially utilised by salmonid species; • **Reptiles** – the Site potentially provides suitable habitat for protected reptile species including adder *Vipera berus*; and • **Amphibians** – the wet habitats of the Site provide potential for breeding and foraging habitat for amphibian species.	• **Freshwater invertebrates (including freshwater pearl mussel *Margaritifera margaritifera*):** No recent records of freshwater pearl mussel have been recorded within the catchment. However, fisheries habitat suitability surveys will be used to undertake focused surveys within waterbodies located within the Site. • **Great crested newt surveys**: habitat present on Site is considered unsuitable to support the species. Additionally, the only one record of great crested newts was identified in the desk study which is over 5km from the Site. • **Terrestrial invertebrates**: no species of interest are known to utilise the Site and there is a vast extent of similar habitat in the surrounding area.
Ornithology	• **Flight activity surveys** –The surveys will include a proportion of dusk VPs to capture owl activity. • **Black grouse population/lek surveys** – Survey will comprise a preparatory walkover to locate suitable habitat and evidence of black grouse presence followed by surveys of any leks located to record the maximum number of lekking males and the number of attending females. • **Breeding raptor surveys** – undertaken across the Site and a surrounding buffer of up to 2km to record breeding activity of target raptor species	• **Migratory waterfowl -** Comparatively low levels of flight activity by such species recorded and the absence of suitable foraging habitat within the site and limited expectation that fields within 500m of the Site would be used by substantial numbers of locally occurring species. • **Castle Loch, Lochmaben SPA and Upper Solway Firth and Marshes SPA -** Survey records are associated with a limited number of migratory flights and not diurnal foraging movements and a low potential to forage in the vicinity of the Site.

Topic	Scoped In	Scoped Out
	• **Moorland breeding bird surveys** –surveys of open ground and moorland within the Site and a surrounding buffer of 500m. • **Nightjar surveys** –surveys of suitable habitat within the Site and a surrounding buffer of 500m.	
Cultural Heritage	• **Gardens and Designed Landscapes -** There are three GDL's within 10 km • **Conservation Areas -** There are two Conservation Areas within 10 km • **Scheduled Monuments -** There is one SM within the Proposed Development boundary and a further 73 SM's within 10 km • **Listed Buildings -** There are 281 LB's within 10 km • **Undesignated Assets -** It is likely that known and unknown archaeological assets may be directly impacted by the construction works for the Proposed Development.	• **Battlefields -** No Battlefields within 10 km • **Marine Protected Areas** - No MPA's within 10 km • **Undesignated Assets** - Once the construction is complete, the potential for direct effects upon known and unknown undesignated assets will be removed.
Hydrology, Hydrogeology, Geology and Soils	• **Surface water features –** There are surface water features on and near to the Site • **Private water supplies** – There is one private water supplies within 1km of the Site Boundary • **Peat** - Of the four soil units on Site, three of them include peat or peaty soils in their composition. • **Groundwater dependent terrestrial ecosystems** - may be present within the Site.	• **Reductions in natural flows arising from any temporary or permanent abstractions.** This would be managed via the Construction Site Licence application process: and • **Increase in Local Flood Risk** - All structures would be designed and constructed following good practice techniques and would be of sufficient capacity to receive storm flows with an allowance for increased flows due to climate change.
Noise	• **Noise, Vibration and Air Overpressure from Blasting at Borrow Pit –** Activity may cause significant noise impacts • **Operational Turbine Noise –** potential for noise impacts to nearby receptors. Assessment will include the cumulative noise impacts of existing nearby windfarm developments.	• **Construction Phase Aspects –** Proximity of receptors and likely activities not anticipated to result in significant effects • **Operational groundborne vibration** - Wind turbines are not significant producers of vibration and they would be located at a significant distance from the nearest receptors. •
Traffic and Transport	• **Construction phase** – potential for construction traffic volumes to impact the road network	• **Operational phase –** anticipated traffic volumes are low
Socio-economics, recreation and Tourism	• **Construction and operation assessment –** potential for local and regional impacts during construction and operation	• None
Forestry and Land Use	• **Forestry assessment** – Proposed Development likely impact upon the existing forestry resource and operations	• Cumulative onsite forestry
Aviation and Radar	• **Operational impacts** – Sensitive receptors within proximity that may be impacted during operation	• None

Topic	Scoped In	Scoped Out
Eskdalemuir Seismic Array	**Operational impacts** - The Proposed Development is within the 50km MOD consultation zone for the Eskdalemuir Seismic Monitoring Array. At present, the MOD has allocated all extant seismic ground vibration for the Array and can be expected to object to the Proposed Development on Eskdalemuir safeguarding grounds. However, the Scottish Government are reviewing safeguarding algorithm under which seismic budget is allocated. An update on this work will be provided in the EIA.	• None
Telecommunications	• **Operational impacts –** Telecommunications link across the Site	• **TV interference** - considered to be a low risk due to analogue TV signals no longer being in use
Air, Climate and Carbon Balance	• **Carbon balance** – assessment will estimate the reduction in carbon emissions of the construction and operation	• **Air Quality -** There are not considered to be any likely significant effects on air quality considering the nature and location of the Proposed Development. • **Climate** – Likely low impact during construction and beneficial impact during operation as a result of supporting the reduction of fossil fuel use.
Population and Human Health	• None	• **Construction and operation -** There are not considered to be any likely significant effects on population and human health considering the nature and location of the Proposed Development.
Major Accidents and Disasters	• None	• **Construction and operation -** There are not considered to be any likely significant effects on the environment as a result of the vulnerability of the Proposed Development to major accidents and disasters.
Material Assets	• None	• **Construction and operation -** Considering the nature and scale of this development, significant effects are not anticipated.

Question 10
Do you agree with the list of issues to be scoped out, and the rationale behind the decision?

15 How to Respond to this Scoping Report

302. This Scoping Report has been issued to the Energy Consents Unit (ECU) in support of a request for a scoping opinion under Regulation 12 of the EIA Regulations.

303. Responses to this Scoping Report will inform the detailed methodology for each aspect of the EIA in conjunction with on-going consultation with statutory and non-statutory consultees throughout the development process.

304. The Applicant invites consultees to comment on the following:

Question 1: Are the proposed Study Areas acceptable for the LVIA and CLVIA?

Question 2: Are there any comments on the overall methodology proposed to assess effects on landscape and visual receptors, including cumulative effects?

Question 3: Are the proposed viewpoint locations acceptable, including for lighting assessment?

Question 4: Are there any other scoping or in planning windfarm sites, in addition to those illustrated, to consider as part of the cumulative assessment?

Question 5: Has the consultee identified any further landscape or visual receptors to be considered within the assessment (e.g. where potential significant effects may occur)?

Question 6: Do you agree with the landscape and visual receptors proposed to be scoped out?

Question 7: Are there any other relevant consultees who should be consulted with respect to the LVIA?

Question 8: Do you agree with the Ecology proposed approach for baseline collection, prediction of effects and significance assessment?

Question 9: Do you agree with the Ornithology proposed approach for baseline collection, prediction of effects and significance assessment?

Question 10: Do you agree with the Cultural Heritage proposed approach for baseline collection, prediction of effects and significance assessment?

Question 11: Do you agree with the Hydrology, Hydrology, Geology and Peat proposed approach for baseline collection, prediction of effects and significance assessment?

Question 12: Do you agree with the Noise proposed approach for baseline collection, prediction of effects and significance assessment?

Question 13: Do you agree with the Traffic and Transport proposed approach for baseline collection, prediction of effects and significance assessment?

Question 14: Do you agree with the Socio-Economics, Recreation, and Tourism proposed approach for baseline collection, prediction of effects and significance assessment?

Question 15: Do you agree with the proposed approach for baseline collection, prediction and significance assessment for the following topics:

- Forestry and Land Use
- Aviation and Radar
- Eskdalemuir Seismic Array

- Telecommunications
- Air, Climate and Carbon Balance
- Shadow Flicker
- Population and Human Health
- Major Accidents and Disasters
- Material Assets

Question 16: Are there any key issues or possible effects which have been omitted?

Question 17: Of those issues identified for assessment, which do you consider the most important/material and which the least?

305. All responses should be sent to the following address:

Lee Crosbie
Energy Consents Unit
4th Floor
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU
lee.crosbie@gov.scot

306. All comments received will be included in the EIA Report for reference, unless consultees request otherwise.

Appendix A: Figures

Appendix B: Register of Commitments

307. The following table lists the commitments made through this Scoping Report which have influences the scope of assessments proposed.

308. An outline Environmental Management Plan will be included as part of the EIA Report which will include these commitments and will be submitted with the application for consent.

Ref.	Description	Scoping Report Reference
SC01	No Freshwater invertebrates (including freshwater pearl mussel *Margaritifera margaritifera*) survey is proposed, however, fisheries habitat suitability surveys will be used to undertake focused surveys within waterbodies located within the Site and appropriate mitigation measures will be adopted.	Section 6.5
SC02	Migratory waterfowl survey is scoped out; however, incidental observations of foraging geese would be recorded during ongoing flight activity and other surveys.	Section 7.5.1
SC03	The requirement for visualisations (in the form of wirelines or photomontages) will also be agreed through consultation and produced from the key Cultural Heritage assets assessed.	Section 8.1
SC04	Mitigation embedded into the design will ensure that the Scheduled Monument within the Site Boundary is not directly impacted upon	Section 8.6.1
SC05	Existing track routes will be used where deemed to be acceptable	Section 9.4
SC06	All development features will be located outwith 50m buffers of OS mapped watercourses as far as possible	Section 9.4
SC07	New watercourse crossings will be minimised.	Section 9.4
SC08	Peat surveys and peat stability assessment data will be used within the design process to minimise incursion on these sensitive receptors	Section 9.4
SC9	During construction, industry best practice principles will be adopted and stated in the CEMP to limit the likelihood of a incident occurring and reduce the magnitude of any incident which does occur.	Section 9.4
SC10	Reductions in natural flows arising from any temporary or permanent abstractions. will be managed via the Construction Site Licence application process	Section 9.5
SC11	All watercourse structures will be designed and constructed following good practice techniques and will be of sufficient capacity to receive storm flows with an allowance for increased flows due to climate change.	Section 9.5
SC12	No turbines are proposed within 1km of any of the noise sensitive receptors identified and construction works are only required around the turbines and the existing access road.	Section 10.2.1
SC13	As Duncow Common windfarm is currently at scoping stage, the progress of this scheme will be tracked, and may be included if an application is submitted during the assessment work. A cut-off date will be agreed during consultation with Dumfries and Galloway Council beyond which no new cumulative schemes will be included for cumulative assessment.	Section 10.2.3
SC14	If it is identified that insufficient data is available for the identified cumulative windfarms, or that the data available is otherwise not suitable for the assessment purposes, then alternative approaches will be agreed during consultation. These may include basing the assessment on seeking compliance with the noise level limits already imposed on the operational windfarms or carrying out a new baseline	Section 10.2.4

Ref.	Description	Scoping Report Reference
	noise survey and filtering the measurement data for upwind conditions only or correcting for the contribution of wind turbine noise following a recognised methodology.	
SC15	Mitigation measures relating to Traffic and Transport will be incorporated into the outline Construction Traffic Management Plan (CTMP) which will be included within the EIA Report.	Section 11.4
SC16	It is anticipated that a Construction Method Statement (CMS) will be prepared by the construction contractors and agreed with the Dumfries and Galloway Council prior to the commencement of the construction works. The Construction Method Statement will include measures for the construction contractor to provide employment opportunities in the local area.	Section 12.4.1
SC17	The Construction Method Statement will also include public notices that would be issued prior to the construction and maintenance works to inform local residents, recreational users and businesses of dates and durations of the works.	Section 12.4.2
SC18	During construction and maintenance, it is anticipated that access will be temporarily restricted for areas surrounding works and alternative paths or accesses route be provided where possible.	Section 12.4.2
SC19	Measures to avoid or mitigate potential impacts upon the forest will, as far as practicable, sought to be embedded in the design of the Proposed Development through consideration of the siting of the turbines and by using existing access tracks.	13.2.4
SC20	The CEMP will contain standard industry best practice mitigation regarding emissions during construction and therefore no significant air quality effects are anticipated.	13.5
SC21	The design of the Proposed Development will comply with guideline flood return periods including climate change allowances and flood risk will be considered in the EIA.	13.5
SC22	Best practice construction health and safety measures will be set out in the CEMP to minimise the potential for significant human health effects.	13.7
SC23	The CEMP will contain controls to minimise material use and waste generation	13.9

Appendix C: List of Consultees

The following consultees will be consulted by the ECU to inform the scope of the EIA. These, and other stakeholders, may also be contacted by topic specialists during the EIA process for information to inform topic assessments.

Category	Consultee
Statutory Consultee	Scottish Environmental Protection Agency
	Scottish Natural Heritage
	Historic Environment Scotland
	Dumfries & Galloway Council
Internal Scottish Government Advisors	Transport Scotland
	Marine Scotland
	Marine Scotland
	Scottish Forestry
Non-Statutory Consultees	British Horse Society
	BT
	Civil Aviation Authority - Airspace
	Crown Estate Scotland
	Defence Infrastructure Organisation
	District Salmon Fisheries Board – Annan
	District Salmon Fisheries Board – Nith
	Fisheries Management Scotland
	Galloway and Southern Ayrshire Biosphere
	Glasgow Airport
	Glasgow Prestwick Airport
	Joint Radio Company
	John Muir Trust
	Mountaineering Scotland
	NATS Safeguarding
	RSPB Scotland
	Scottish Rights of Way and Access Society (ScotWays)
	Scottish Water
	Scottish Wildlife Trust
	Scottish Wild Land Group (SWLG)
	South Lanarkshire Council
	The Coal Authority
	Visit Scotland
	West of Scotland Archaeology Service
	Ae Community Council
	Kirkmichael Community Council
	Auldgirth and District Community Council
	Closeburn Community Council
	Johnstone Community Council
	Kirkmahoe Community Council
	Tinwald Parish Community Council

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