

Ravengill Energy Park

Environmental Impact Assessment Report

Volume 1: Non-Technical Summary

June 2026



Introduction

Overview

This document forms the Non-Technical Summary (NTS) of the Environmental Impact Assessment (EIA) Report (EIAR) for the proposed Ravensgill Energy Park (the 'Proposed Development') which is located approximately 1 km north of Leadhills village and 1.5km south of Abington village in South Lanarkshire Council, Scotland.

The Proposed Development comprises an electricity generating station with up to 21 wind turbines with a maximum blade tip height of up to 220 m with a total generating capacity greater than 50 MW, as well as a battery energy storage system (BESS) of approximately 50 MW storage capacity, both supported by ancillary infrastructure. The location of the Site and the Site Boundary is outlined in **Figure 1**.

The EIAR accompanies an application by Ravensgill Energy Park Limited (hereafter referred to as 'the Applicant') to the Scottish Ministers for consent under Section 36 of the Electricity Act 1989 and deemed planning permission under Section 57 of the Town and Country Planning (Scotland) Act 1997. The EIAR provides the environmental information that Scottish Ministers must take into account when considering a decision to grant consent under the Electricity Act and directing that planning permission be deemed granted.

The EIAR comprises the following five volumes:

- Volume 1: Non-Technical Summary (NTS);
- Volume 2: Main Report;
- Volume 3a: Figures;
- Volume 3b: Visualisations;
- Volume 4: Technical Appendices; and
- Volume 5: Confidential Appendices.

The EIAR documents the EIA process that has influenced the design of the project and reports on any predicted likely significant effects of the Proposed Development. Where it has been possible to do so through the design process and/or through commitments made as part of the Proposed Development, the EIAR sets out how these effects have been reduced or mitigated.

Additional documentation that has been submitted with the Section 36 application for consent, that do not form part of the EIAR, includes:

- Cover letter;
- Planning Statement;
- Pre-Application Consultation Report;
- Community Benefit Statement;
- Design Statement; and
- Maximising Socio-Economic Benefits Report.

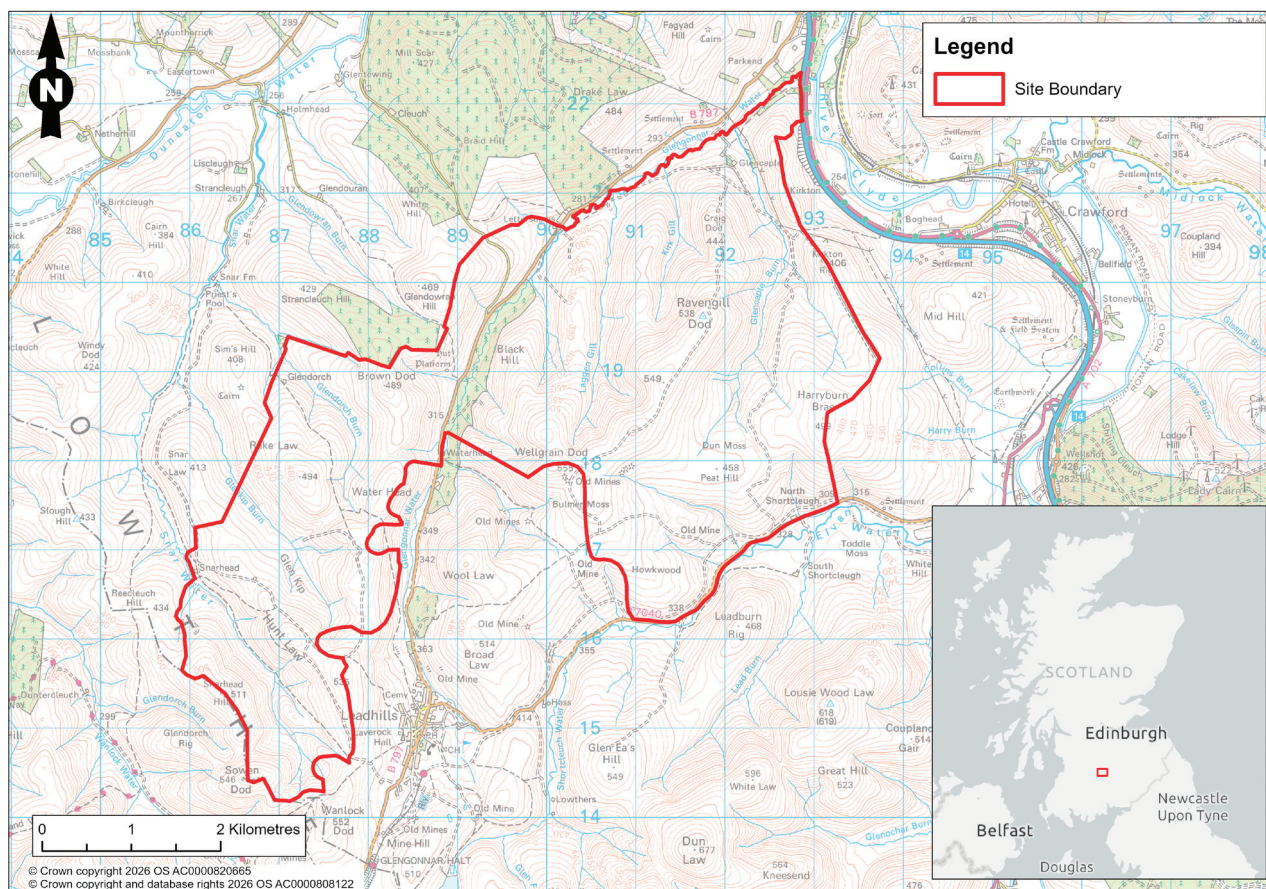


Figure 1: Site Location

Purpose of the Non-Technical Summary

The purpose of the NTS is to:

- Summarise the content and main findings of the EIAR in a clear and concise manner to assist the public in understanding how the Proposed Development has been designed;
- Provide a description of the reasonable alternatives, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;
- Set out what the predicted likely significant environmental effects of the Proposed Development would be; and
- Set out any mitigation measures proposed to reduce these effects.

For a complete understanding of the Proposed Development the NTS should be read alongside the EIAR.

EIA Process

EIA is the process undertaken to present a clear and impartial assessment of the potential environmental effects (both beneficial and adverse) of a proposed development and the potential mitigation measures to avoid, reduce, and offset likely significant adverse effects.

The EIA process adopted for the Proposed Development has followed best practice guidelines as set out by the Institute of Sustainability and Environmental Professionals' Quality Mark Scheme¹. The EIAR has been prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations')².

Copies of the EIAR

Paper copies of this NTS and the other volumes of the EIAR will be made available to view at the following publicly accessible location:

- Crawfordjohn Village Hall, Manse Road, Crawfordjohn, Biggar, ML12 6SR;
- Crawford Hall, 100 Carlisle Road, Crawford, Biggar, ML12 6TW; and
- Leadhills Hall, 35 Ramsay Street, Leadhills, Biggar, ML12 6YA.

Printed copies of this NTS and USB sticks containing the full EIAR will also be available to take away from the above location, while stocks last.

The EIAR, including all figures, technical appendices and accompanying documents are available to view and download on the project website³ free of charge.

The application documents will also be available via the Scottish Government Energy Consents Unit (ECU) portal⁴ under application reference ECU00006172 and on South Lanarkshire Council (SLC) planning portal⁵.

The Applicant will work closely with the Scottish Government's ECU to ensure all relevant statutory consultees receive a physical copy of this EIAR upon request.

In the interests of sustainability and the drive towards Net Zero carbon emissions, reference to the paperless (project website/ECU and SLC online planning portals/USB) version is strongly recommended.

For anyone who has difficulty accessing the documentation online, a USB copy will be made available free of charge by contacting the Project Team:

- By Email: ravengill@renewcopower.com
- By Phone: 0141 3196144
- By post: Ravengill Energy Park Ltd, Renewco Power, 10 Newton Place, Glasgow, G3 7PR.

Hard copies of the EIAR can be printed for purchase on request from the Project Team (details above) at a charge of £2,000 for a hardcopy and £15 on USB storage device. Copies of a short Non-Technical Summary are available free of charge.

1 <https://www.isepglobal.org/corporate-programmes/eia-quality-mark/>

2 <https://www.legislation.gov.uk/ssi/2017/101/contents>

3 [Ravengill Energy Park | Renewco Power](#)

4 <https://www.energyconsents.scot/Default.aspx>

5 <https://publicaccess.southlanarkshire.gov.uk/online-applications/>

Commenting on the Application

The EIAR has been published in accordance with Part 5 of the EIA Regulations and Regulation 4 of the Electricity (Applications for Consent) Regulations 1990⁶. It has been advertised on the project website³ and in the following newspapers upon submission of the application:

- Edinburgh Gazette;
- A national newspaper for one week (The Herald);
- The Carlisle & Lanark Gazette for two successive weeks; and
- The Carlisle and Lanark Advertiser for two successive weeks.

The advertisement provides details of the date by when representations should be made. The Scottish Government invites formal representations on the Proposed Development, which will be taken into account before any decision is reached on the application.

Any representations on the application may be submitted via www.energyconsents.scot, using the relevant Project Name and/or ECU reference number (ECU00006172). Please note that you must be in possession of a working email address to submit a representation online.

Representations can also be submitted by post to Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the Proposed Development and specifying the grounds for representation.

Written representations should be dated and clearly state the relevant Project Name and/or ECU reference number (ECU00006172) in addition to clearly stating the name (in block capitals) and full return postal address of those making representations.

Image: Southern Upland Way, Whing Head



6 <https://www.legislation.gov.uk/uksi/1990/455/contents/made>

Consultation on the Scope of the EIA

Scoping

The Applicant submitted a request for a Scoping Opinion to Scottish Ministers in May 2025, under the provisions of Regulation 12 of the EIA Regulations. This request was accompanied by a Scoping Report, prepared by the Applicant, which set out a summary of the Proposed Development; identified the likely significant environmental effects, and summarised the proposed scope of the EIA. The Scoping Report forms **Technical Appendix 1.4 of EIAR Volume 4**.

A Scoping Opinion was received from the ECU on 10th September 2025. The contents of this and other consultation responses received are summarised in **Technical Appendix 1.2 of EIAR Volume 4**, along with a list of all bodies consulted during the scoping exercise.

The scoping process sought to allow the EIAR to focus on the main areas of interest raised by various consultees, with agreement with consultees that impacts which are not likely to result in significant effects could be scoped out of further assessment.

Public Consultation

In addition to seeking a Scoping Opinion, the Applicant conducted public exhibitions to seek the views of the local community, as follows:

- 20 May 2025, 15:00 to 19:00, Leadhills Hall (35 Ramsay Rd, Leadhills, ML12 6YA);
- 21 May 2025, 15:00 to 19:00, Crawfordjohn Hall (Manse Rd, Crawfordjohn, ML12 6SR);
- 10 February 2026, 15:00 to 20:00, Leadhills Hall (35 Ramsay Rd, Leadhills, ML12 6YA); and
- 11 February 2026, 15:00 to 20:00, Crawfordjohn Hall (Manse Rd, Crawfordjohn, ML12 6SR).

A summary of the representations received during the public exhibitions and associated consultation periods is provided in the **Pre-Application Consultation Report**, which accompanies the application.

Image: B797 South of Leadhills



The Proposed Development

Site Location

The Site covers an area of approximately 2,555 hectares (ha) and is located approximately 1 km north of Leadhills village and 1.5 km south of Abington village, with the A74(M) motorway located to the east, in South Lanarkshire, Scotland. The Site is located within the wider Southern Uplands area.

The majority of the Site consists of open upland moorland, much of which is managed for grouse and sheep grazing, improved grassland and semi improved grassland, with areas of forestry located in the valleys, predominantly to the east of the B797. The Site terrain is undulating with a series of rounded hills, which is typical of the wider Southern Uplands landscape.

The surrounding area is sparsely populated, with settlement largely confined to the valleys. Key settlements within the vicinity of the Site include the villages of Abington, Crawford, Crawfordjohn, Elvanfoot, Leadhills and Wanlockhead. There are three residential properties located within the Site boundary: North Shortcleugh Farm, Lettershaws Farm Cottage and Glencaple Farm Cottage, with other residential properties located sporadically in the surrounding area.

There is one designated heritage asset (a Scheduled Monument) within the Site: Waterhead, platform settlement (SM 4714). There are also three sites recorded in the Historic Environment Record within the Site that are classed as being of potential national importance. A number of Scheduled Monuments are located immediately outside the Site boundary, largely associated with historic mining activity and prehistoric settlement, and there are listed buildings concentrated in the villages of Leadhills and Wanlockhead.

There is one statutory site designated for nature conservation within the Site boundary: the Raven Gill Site of Special Scientific Interest (SSSI), which is designated for geological stratigraphy features (Arenig–Llanvirn). No development is proposed within the SSSI.

Wind farms are an existing feature of the surrounding landscape within this part of southern Scotland and there are several operational, consented, and proposed wind farms within the surrounding landscape of the Site (**Figure 2**) including Priestgill Wind Farm (consented and under construction) to the northeast, Clyde Wind Farm (operational) to the east, Lion Hill Wind Farm (consented) to the southeast, and Andershaw and Middle Muir Wind Farms (operational) to the northwest. Proposed developments in the wider area include the M74 West Renewable Energy Park, Grayside Wind Farm, Clyde South Energy Park, Watchman Energy Park, Glensalloch Wind Farm, and West Andershaw Wind Farm.

Image: Tinto Hill



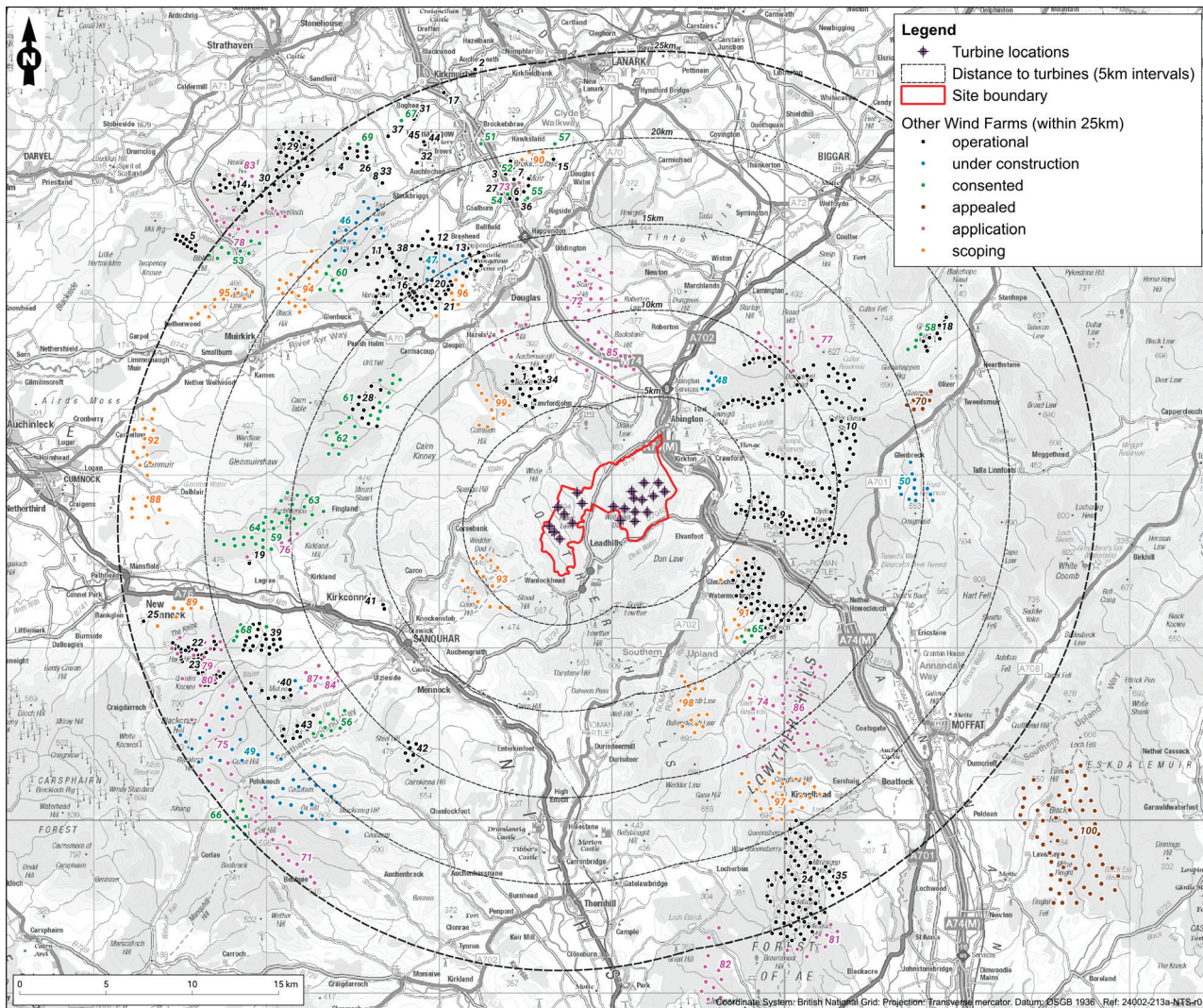


Figure 2: Cumulative Schemes in relation to the Proposed Development

Description of the Proposed Development

The layout of the Proposed Development is shown on **Figure 3** and would comprise a Renewable Energy Park inclusive of wind turbines and a BESS with the following key components:

- Up to 21 wind turbines with a maximum tip height up to 220 m and with a combined generation capacity of greater than 50 MW;
- Permanent turbine foundations and associated permanent and temporary crane hardstanding at each turbine location;
- A temporary construction site entrance from the A74(M) motorway, to allow delivery of only abnormal indivisible loads (AIL) required for turbine component delivery. Empty AIL vehicles would return to the road network via the B797 road, rejoining the M74 at Junction 14;
- Series of new, or upgraded, on-site access tracks with associated watercourse crossings and turning heads;
- Underground power cables within the Site, generally laid in trenches alongside access tracks, connecting the turbines to the on-site substation;
- On-site Substation and control building;
- A BESS of approximately 50 MW capacity⁷ co-located within the on-site substation; and
- Four temporary Construction Compound and laydown areas, the main one located adjacent to the substation and BESS sites and three satellite compounds: two located in the western area of the Site and the other located in the northern area.

In addition, the following ancillary works would be required, including:

- Extraction of rock from borrow pits with four borrow pit search areas located within the Site;
- Temporary on-site concrete batching plant located within the Temporary Compound areas and/or one of the borrow pit search areas; and
- Works on land outside the main development area and immediately adjacent to the A74(M) to facilitate the delivery of AIL (e.g. construction of over-run areas and temporary modifications to street furniture etc), where necessary.

The locations of the proposed turbines and other infrastructure would be subject to 'micrositing' which allows for minor changes in turbine or infrastructure locations to respond to possible variations in ground conditions across the Site, which would only be confirmed following detailed site investigation work carried out prior to construction. This process also provides scope for further mitigation of localised potential environmental effects through the avoidance of sensitive features, where required. It is anticipated that the micrositing distance of 100 m would form a condition accompanying any consent. Any repositioning would be carried out under the supervision of an Ecological Clerk of Works (ECOW) and an appropriately experienced and qualified engineer with the objective to avoid environmentally constrained areas.

⁷ Approximate capacity of the BESS based on current technology.

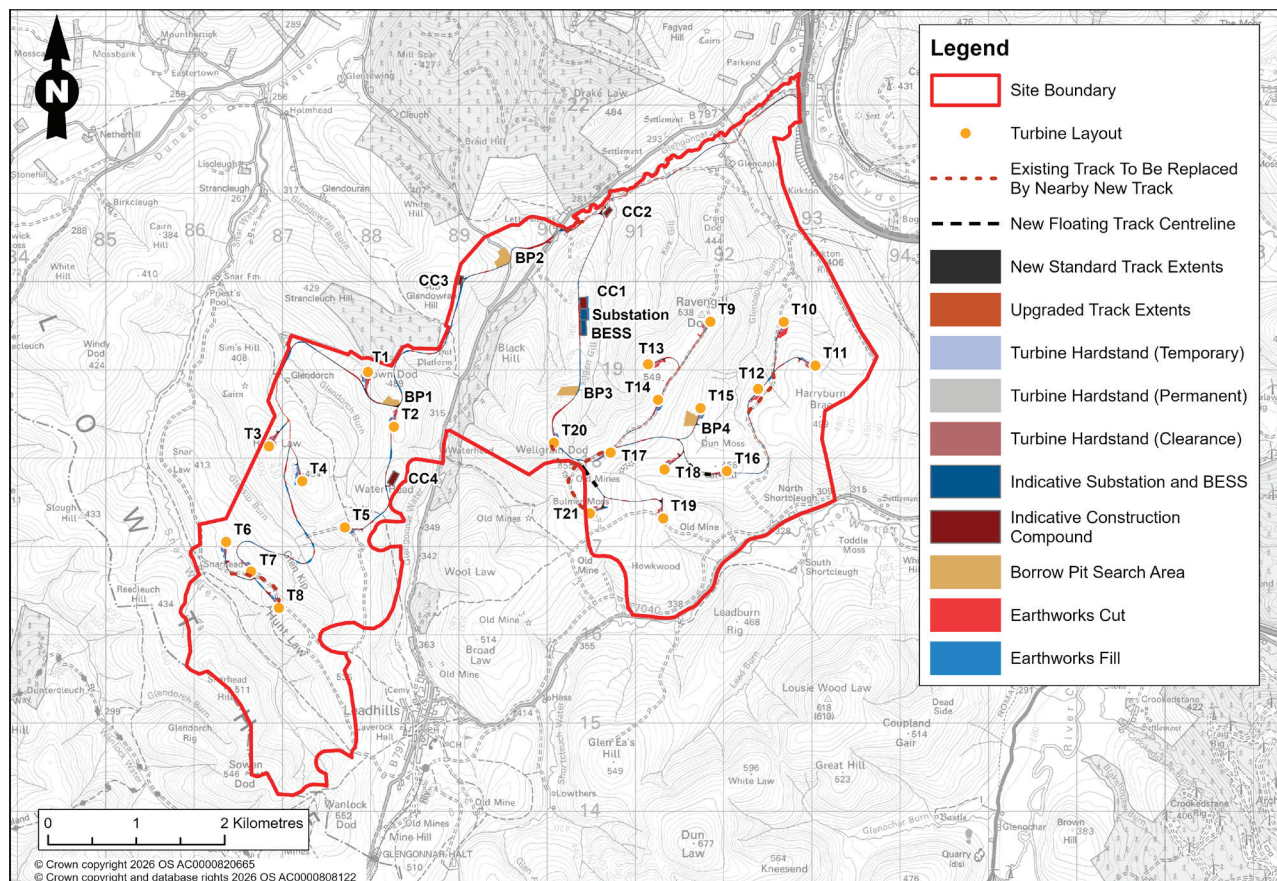
The wind turbines would be fitted with lighting to comply with aviation regulations. In order to mitigate the nighttime visual impact of the Proposed Development on non-aviation receptors, a reduced lighting scheme has been designed and, separate from the planning process, submitted for approval by the Civil Aviation Authority (CAA). The reduced lighting scheme proposes 2000 candela (cd) steady red lights on ten of the 21 turbines and no mid-tower lighting. Furthermore, infra-red lighting (not visible to the naked eye) is proposed on each of the turbines that are to be lit with visible lighting and four further turbines in response to the Ministry of Defence (MoD) requirement for this type of lighting on turbines in low flying areas.

At time of Application the Proposed Development has a signed grid connection agreement (GCA) for 2036 to connect to the Elvanfoot Substation, approximately 4.5 km southeast of the proposed on-site substation. Under ongoing grid reforms the Proposed Development has been confirmed as a Gate 1 project, meaning there is no confirmed location or date for the grid connection

and the existing GCA will be cancelled and replaced with a Gate 1 offer in due course. There is no longer any certainty that the Proposed Development would connect at Elvanfoot or the timing of any connection to the national grid.

On receipt of a section 36 consent the Proposed Development would be able to apply for a Gate 2 offer which would indicate a grid connection date and location. Any grid connection date and location in a Gate 2 offer would remain subject to change as the Proposed Development moves forward in the grid connection queue, with the Proposed Development potentially changing connection location and date depending on availability of capacity that it could fill on the network. Whilst a Gate 2 offer is progressing towards being delivered, it would be the responsibility of Scottish Power Energy Networks (SPEN) to provide the grid connection, including identification of the most suitable route, technology, and any necessary consents.

Figure 3: Proposed Development Layout



Construction Activities

The construction of the Proposed Development would take approximately 18 months.

The typical construction hours of work would be Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00. No works, with the exception of turbine delivery, the completion of turbine erection and commissioning of emergency works, would take place outside of these hours. Other such out-of-hours works would be subject to prior agreement with SLC.

The requirement for out-of-hours work could arise, for example, from delivery and unloading of abnormal loads or health and safety requirements, or to ensure optimal use is made of fair-weather windows for the erection of turbine blades and the erection and dismantling of cranes.

A Construction Traffic Management Plan (TMP) submitted to SLC for approval in consultation with Transport Scotland. This would address the scheduling, routing and overall management of abnormal loads movements along with the programming and management of all other heavy goods vehicle (HGV) movements.

A Construction Environmental Management Plan (CEMP) would be implemented during construction to avoid, reduce or control associated adverse environmental effects. An Outline CEMP is provided in **Technical Appendix 2.1 of EIAR Volume 4**. A detailed CEMP would be submitted to SLC for approval in consultation with relevant statutory consultees prior to construction commencing and this would, as a minimum, include the following measures:

- Construction methodologies;
- Control of contamination / pollution prevention measures;
- Peat slide, erosion and compaction management;
- Drainage management and SuDS;
- Water quality monitoring;

- Management of construction traffic;
- Control of noise and vibration;
- Control of dust and other emissions to air; and
- Public liaison provision.

Operational Management and Maintenance

The expected operational life of the Proposed Development is 40 years from the date of commissioning.

Wind turbines and wind energy projects are designed to operate largely unattended, with operational monitoring often undertaken remotely with regular monthly or weekly maintenance on-site and emergency works as required. Each turbine at the Proposed Development would be fitted with an automatic system designed to supervise and control a number of parameters to ensure proper performance (e.g., start-up, shut-down, rotor direction, blade angles etc.) and to monitor condition (e.g., generator temperature).

The control system would automatically shut the turbine down should the need arise. Sometimes the turbines would re-start automatically (if the shut-down had been for high winds, or if the grid voltage had fluctuated out of range), but other shutdowns (e.g., generator over temperature) would require on-site investigation and manual restart.

During regular operations, the on-site substation would require only occasional visits for routine maintenance, safety inspections, and performance testing carried out by specialist technicians. It would otherwise predominantly be operated remotely, with automated monitoring systems alerting engineers should intervention be necessary.

Operational use of Natural Resources, Residues and Emissions

In line with the EIA Regulations, the EIAR has considered the potential for residues and emissions (such as water; air; soil and subsoil; noise and vibration; light; heat and radiation; and waste) associated with the construction and operation of the Proposed Development.

With the implementation of the CEMP, no significant residues or emissions have been identified during the construction phase.

The EIAR provides further information on the likely emissions of light and noise from the Proposed Development. Under current regulations, an agreed scheme of aviation lighting would be required. Wind turbines emit noise; however, the emissions would be managed in accordance with acceptable noise limits to avoid likely significant effects.

The expected carbon payback time of the Proposed Development is 0.2-1.5 years with an expected value of 1.1 years. This is the period for which a wind farm needs to be in operation before it has avoided as much carbon dioxide that would have been emitted by fossil fuel energy generation, as was released in its lifecycle (i.e. accounting for construction, operation and decommissioning) as determined using the Scottish Government Carbon Calculator⁸.



Decommissioning

At the end of the Proposed Development's operational lifespan, a decision would be made as to whether to refurbish, replace or remove the wind turbines, with relevant consent applications required for refurbishment or replacement of turbines if these options were chosen.

If a decision were to be taken to decommission (i.e., remove) the Proposed Development, this would entail the removal of all the turbine components, the BESS and on-site substation. Access tracks and underground cables would, subject to further appraisal of the best environmental option and regulations in place at the time of decommissioning, be left in place, partially removed or fully removed. It is assumed that the foundations would be removed to a depth of 1.2 m below ground level (exact depth to be confirmed at point of decommissioning) before being covered in topsoil to avoid environmental effects from full removal.

A Decommissioning Environmental Management Plan (DEMP) would set out environmental protection measures and restoration principles which would be implemented by the Contractor appointed to undertake the decommissioning works. This Plan would be submitted to SLC for approval in consultation with other relevant consultees as appropriate prior to the commencement of decommissioning activities.

Image: Glengaber Hill

Design Evolution and Alternatives

Site Selection and Considerations

In 2022, the Applicant identified the Site, and the wider area which includes the nearby sites of the proposed M74 West, Watchman and Clyde South projects, as suitable for renewable energy development.

The Site was identified as suitable for wind farm development for the following reasons:

- The Site is situated amongst a cluster of operational, proposed and consented wind farms, including the operational Clyde Wind Farm to the east, and as such there is similar development existing and proposed in the area;
- The Site has a good anticipated wind resource;
- The Site is considered able to accommodate a renewable energy development whilst avoiding significant direct effects on areas designated for nature conservation;
- The Site has good proximity to the public road network, with scope to deliver suitable access to the Site for both construction traffic and AIL whilst avoiding potential for impacts on local road users; and
- The Site has good access to the electricity transmission network and a grid connection to the Elvanfoot Substation that can be achieved in a reasonable timeframe⁸.

Alternative Layouts

Figure 4 summarises the design evolution of the wind turbine layout from Layout 01 (Initial Landscape Design) to Layout 06 (Design Freeze). The design process was iterative, with the design evolving as environmental constraints were identified through a series of desk-based studies and site surveys, as well as from feedback received from consultees. Layout 06 (Design Freeze) forms the conclusion of the design process and represents the layout taken forward for Section 36 consent; it was taken forward because it:

- Responds to landscape capacity and visual considerations through an iterative design process that refined turbine numbers, spacing and positioning across the Site;
- Takes account of cultural heritage constraints, including avoiding direct and indirect impacts on designated and non-designated heritage assets and their settings;
- Reflects detailed consideration of environmental constraints identified through surveys and desk-based assessments, including peat depth, sensitive ecological habitats and watercourses;
- Incorporates the findings of noise modelling, ornithology surveys, habitat surveys and community feedback received during consultation;
- Accounts for engineering and infrastructure requirements, including optimisation of internal track layout and turbine micro-siting to avoid areas of deeper peat, mining risk areas and unsuitable gradients; and
- Responds to aviation and telecommunications constraints through further turbine removals and repositioning where required.

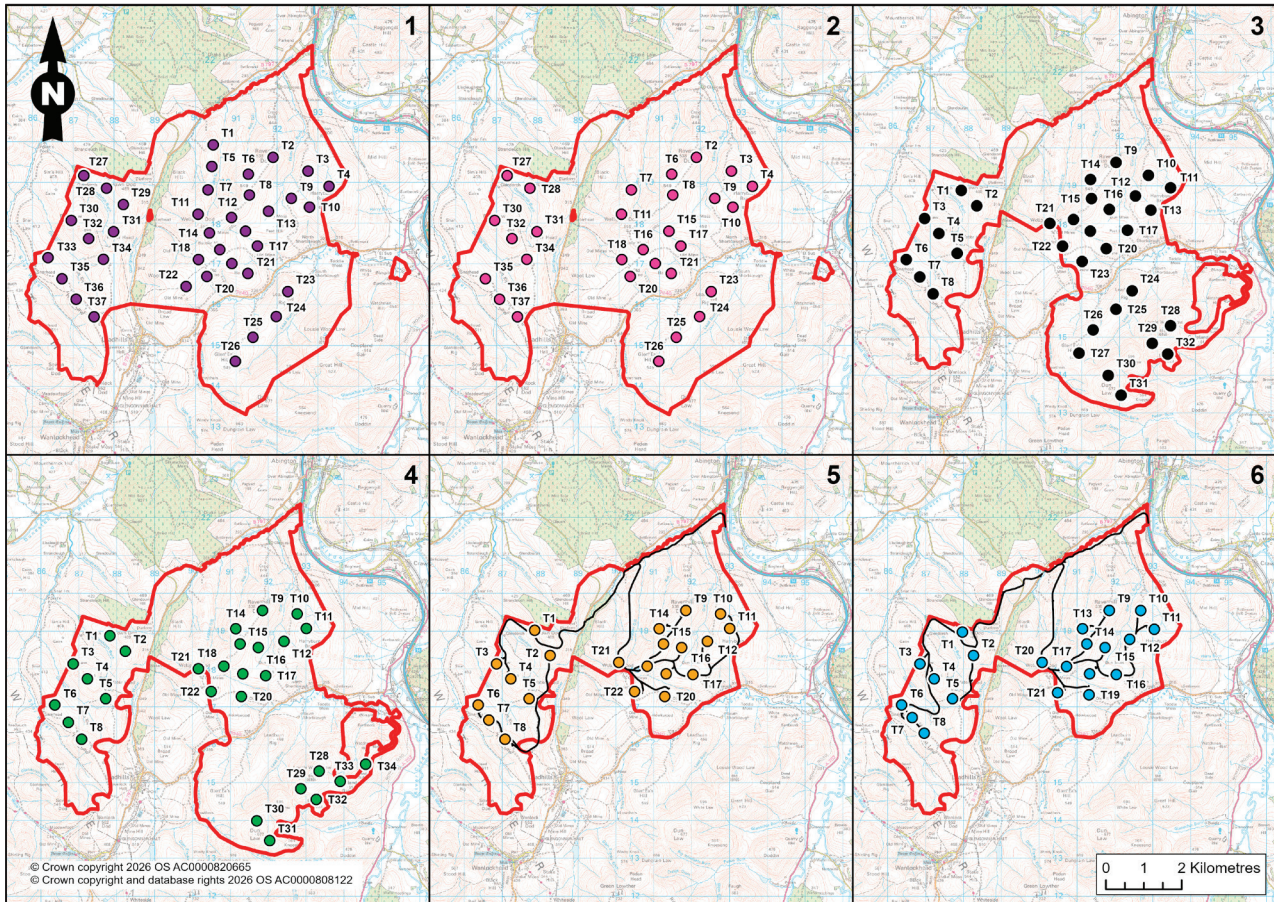


Figure 4: Design Layout Iteration

The final Design Freeze layout comprises 21 turbines and has been informed by detailed review of access and infrastructure layout. Final amendments included changes to access track alignments to avoid cultural heritage assets, areas of deeper peat, blanket bog habitat and historical mining areas, as well as minor turbine relocations to avoid telecommunications link paths and reduce overall track length

Potential Significant Environmental Effects

Introduction

The following environmental topics have been considered as part of the EIAR:

- Landscape and Visual Amenity;
- Cultural Heritage;
- Ecology;
- Ornithology;
- Hydrology, Hydrogeology and Geology;
- Traffic and Transport;
- Noise;
- Aviation; and
- Shadow Flicker.

The conclusions of the EIA are that potential likely significant effects were identified for a number of topics, however for the majority of these, the application of mitigation would reduce these effects to a non-significant level. The only exception to this is for certain effects on Landscape and Visual Amenity and Cultural Heritage receptors, where some significant operational residual effects would remain.

Image: North of Harryburn Brae



Landscape and Visual Amenity

Chapter 4: Landscape and Visual Amenity (EIAR Volume 2) considers the potentially significant effects of the Proposed Development in relation to the landscape and the visual and residential amenity of the local environment.

Desk-based studies, including Zone of Theoretical Visibility (ZTV) mapping, and field survey work were carried out to establish the current landscape and visual baseline context of the Site and area to which it relates, and to identify key sensitive receptors and representative viewpoints for assessment based on those likely to be affected by views of the Proposed Development.

The Site is located across one Landscape Character Type (LCT), the Southern Uplands – Glasgow & Clyde Valley (LCT 217), which is characterised by an extensive, large-scale upland landscape of rounded hills and open moorland, typical of the wider Southern Uplands. The landscape has a strong sense of elevation and openness, with long views and a generally upland character.

The Site is located entirely within the Leadhills and Lowther Hills Special Landscape Area (SLA), which is a locally designated landscape identified for its sense of relative remoteness, upland character and mining heritage.

The M74 Motorway / A74 (M), A73, A702, B797, B7040 and B7078 roads, as well as the West Coast Mainline Railway and National Cycle Route (NCR) 74, are located within visual range of the Site. A section of the B797 road passes through the Site. Other receptors with potential views of the Proposed Development include the Southern Upland Way (SUW), a number of Scottish Hill Tracks, and Core Paths. The Site lies within a predominantly upland landscape that is popular for hill walking, and many surrounding hill summits offer extensive views across the Southern Uplands, including parts of South Lanarkshire, East Ayrshire, Dumfries and Galloway and the Scottish Borders.

The assessment identified potential significant residual effects on the landscape of the Site during the construction and decommissioning phases. These effects would be short-term, temporary and reversible, and associated with activities such as site preparation, the extraction of stone from on-site borrow pits, construction of access tracks and turbine bases, the presence of temporary construction compounds and laydown areas, and crane operations associated with turbine erection.

During the operational phase, the assessment identified potential significant (localised) residual effects on the landscape of the Site, relating to physical changes to the landscape fabric and the introduction of turbines and associated infrastructure. Significant effects were also identified in relation to landscape character, where key characteristics of LCT 217 would be altered within the area closest to the Proposed Development. Effects on the Leadhills and Lowther Hills SLA were identified in relation to a reduction in the 'sense of emptiness' within parts of the designation, particularly in areas closest to the Site. No other special qualities of the SLA, including mining heritage or upland land cover, would be affected and, while some change to the sense of emptiness would occur, this would not affect the overall integrity of the designation.

Significant changes to views were identified from a number of visual receptors, including sections of the B797 and B7040 roads, parts of the M74 Motorway / A74 (M), the A702, National Cycle Route 74, the Southern Upland Way, selected Scottish Hill Tracks, Core Paths within 5 km of the Site, and hill summits within the wider upland area. The extent and strength of visual effects would generally reduce with distance, due to landform and screening by forestry and woodland, with the most pronounced effects occurring within and close to the Site and significant effects generally extending to within approximately 10 km.

The assessment of aviation lighting concluded that there would be significant effects on a limited number of non-aviation receptors, including sections of the Southern Upland Way, selected Scottish Hill Tracks, Core Paths within 5 km, surrounding hill tops and residential properties within approximately 2.5 km of the Proposed Development. These effects would represent an extension of daytime visual effects into hours of darkness and would affect a relatively small number of people.

A residential visual amenity assessment (RVAA), reported in **Technical Appendix 4.8 of EIAR Volume 4**, considered the potential change in views from 19 groups of residential properties within approximately 2.5 km of the Proposed Development. While some properties were assessed as experiencing a high magnitude of visual change, it was concluded that the residential visual amenity threshold would not be reached for any of the properties assessed.

From a cumulative perspective, the assessment concluded that there would be no increase in the landscape character or visual effects identified in the LVIA when the Proposed Development is considered alongside other wind energy developments in the area, for both the consented and in-planning scenarios.

Image: Typical Site Setting



Cultural Heritage

Chapter 5: Cultural Heritage (EIAR Volume 2) considered the likely significant environmental effects arising from the construction, operation, and decommissioning of the Proposed Development on cultural heritage (historic environment sites and features, archaeological remains, and built heritage).

The assessment was informed by desk-based assessment and field surveys to establish the cultural heritage baseline within the Site and within the wider landscape (generally referred to as 10 km from the Site boundary). The assessment has been informed by scoping response provided by Historic Environment Scotland (HES) and further consultation undertaken with HES.

One Scheduled Monument, Waterhead, platform settlement 900 m north of (SM4714), and 92 non-designated heritage assets of varying heritage value and sensitivity are located within the Site. The non-designated heritage assets comprise prehistoric, medieval and modern sites and features, including platform settlements, farmsteads, sheepfolds, field walls, grouse butts and remains associated with mineral prospecting and lead mining. The Site is considered to have a varied archaeological potential, with moderate potential for previously undiscovered buried archaeological remains on lower valley slopes and lower potential on upper slopes.

Within 10 km of the Site there are 64 Scheduled Monuments, two Category A Listed Buildings, 15 Category B Listed Buildings, 12 Category C Listed Buildings, one Inventory Garden and Designed Landscape and two Conservation Areas. Of these, a large number of designated heritage assets are predicted to have theoretical visibility of the Proposed Development, including 53 Scheduled Monuments, one Category A Listed Building, the Inventory Garden and Designed Landscape, nine Category B Listed Buildings, three Category C Listed Buildings and both Conservation Areas.

In addition, within 5 km of the Site there are 36 non-statutory register sites of schedulable quality and ten Dumfries and Galloway Nationally Important Sites. Many of these non-designated heritage assets are considered to be of national importance and a number are predicted to have theoretical visibility of the Proposed Development.

Following the application of embedded and standard mitigation, including construction works being undertaken in line with the Outline CEMP, the appointment of an Archaeological Clerk of Works (ACoW), the implementation of appropriate stand-off buffers and protective fencing for designated heritage assets, and the use of archaeological monitoring, watching briefs and recording where required, the assessment identified no significant residual effects during construction.

Potential operational effects on the settings of designated heritage assets and non-designated assets considered to be of national importance were assessed. One impact of Moderate adverse significance (Significant in EIA terms) was identified on the setting of Leadhills Conservation Area.

No mitigation is available to further reduce the setting impact on Leadhills Conservation Area. However, it is considered that the context and siting of the village as a historic mining settlement within a remote upland landscape would be adequately preserved and that it would remain possible to understand, appreciate and experience its cultural significance, despite the presence of renewable energy infrastructure in the wider landscape.

All other operational effects on the settings of heritage assets within the Site and within 10 km of the Proposed Development were assessed as being of Minor or Negligible significance and not significant in EIA terms.

There are no predicted significant cumulative impacts during construction, operation or decommissioning on heritage assets within the Site and within 10 km of the Proposed Development.

Ecology

Chapter 6: Ecology (EIAR Volume 2)

presents the assessment of the likely significant environmental effects as a result of the Proposed Development in relation to Important Ecological Features (IEFs) and the species that rely on them, some of which are afforded statutory protection.

North Lowther Uplands Site of Special Scientific Interest (SSSI), designated for its assemblage of upland vegetation communities representative of the Southern Uplands, lies 3.2 km to the west of the Site. The latest assessed condition of the SSSI was 'unfavourable recovering' as of 15 January 2019 due to negative pressures associated with burning and overgrazing. The most important habitats included within the upland assemblage are blanket bog, heather moorland and acid grassland.

There are no Local Nature Conservation Sites (LNCS) within 5 km of the Site.

There are several stands of ancient woodland within 5 km of the Site boundary; most lie to the north. The majority of these ancient woodland stands are categorised as Long-Established (of plantation origin), with a few small patches categorised as Ancient (of semi-natural origin) or Other (on Roy map). There is one very small area of ancient woodland within the Site, along Glengonnar Water in the far north of the Site, which is categorised as Long-Established (of plantation origin) and is located approximately 35 m from a section of proposed track which would be an existing track to be upgraded.

A search of the NBN Atlas Scotland covering a 5 km buffer from the Site boundary in the past 15 years (i.e. from 2010 onwards) identified records of the following protected or notable species:

- adder;
- badger;
- brown long-eared bat;
- common lizard;
- common pipistrelle;
- daubenton's bat;
- mountain hare;
- natterer's bat;
- red squirrel; and
- soprano pipistrelle.

A further search covering a 10 km buffer identified records of Leisler's bat. Records of invasive non-native species include grey squirrel and North American signal crayfish.

The Site predominantly supports a mixture of acid dry dwarf shrub heath, marshy grassland, unimproved acid grassland, blanket bog, wet dwarf shrub heath and wet modified bog. Other habitat types distributed across the Site include bracken, recently felled coniferous plantation, semi-improved grassland and acid/neutral flushes. Habitat surveys confirmed that much of the peatland within the study area is in a modified, drained, or actively eroding condition, with no near-natural peatland recorded.

The Proposed Development would result in direct habitat loss due to the construction of infrastructure, such as tracks, turbines, hardstandings, laydown areas, compounds, borrow pits, substation and BESS. Much of this infrastructure would be permanent; however, temporary areas and borrow pits would be restored at the end of construction. There is also potential for indirect changes to wetland habitats near infrastructure due to localised drying effects.

In addition to habitat reinstatement following the completion of construction works, the Proposed Development would also provide for the delivery of long-term beneficial biodiversity enhancement measures through the Biodiversity Enhancement and Management Plan (BEMP). The BEMP includes measures to restore and enhance peatland habitats, including areas with drains, hags/gullies and bare peat, and also includes wider habitat enhancement measures such as native broadleaved woodland and riparian corridor creation/enhancement, bracken management, habitat enhancement for ground nesting raptors, and long-term sustainable grazing management. An Outline BEMP is provided in **Technical Appendix 6.7 of EIAR Volume 4**.

Following the application of mitigation, including construction works being undertaken in line with measures detailed in the CEMP, the appointment of an ECoW, implementation of a Species Protection Plan (SPP), embedded buffers around sensitive habitats and watercourses, and biosecurity measures to ensure no spread or release of signal crayfish, the assessment identified no significant construction, operational or cumulative residual effects on IEFs. The main habitats scoped into the assessment were blanket bog and wet modified bog, for which the predicted effects were assessed as Minor adverse and not significant in EIA terms, with beneficial effects anticipated through the delivery of the BEMP.

Pre-construction surveys would be undertaken to check for any new protected species or features near construction works, and operational phase monitoring of habitats and species would be undertaken as part of the BEMP. An integrated water quality and fish population monitoring programme would also be implemented pre-construction, during construction, and post-construction on relevant watercourses.

Image: Acid Grassland



Image: Peat Hagg Erosion



Ornithology

Chapter 7: Ornithology (EIAR Volume 2)

considers the potential for significant effects on birds associated with the construction, operation and decommissioning of the Proposed Development, relating to disturbance during construction, operational displacement which could impact on breeding success, productivity and/or survival rates, and collision risk mortality.

Baseline conditions to inform the design and assessment of the Proposed Development have been established through desk study, ornithological field surveys and consultation with nature conservation bodies and specialist species recording groups.

The Site does not form part of any statutory designated site for nature conservation with qualifying ornithological interests.

Baseline studies have established that the Site and adjacent habitats are used by Schedule 1 raptors including red kite and golden eagle. The Site has also been recorded to support an assemblage of breeding waders, including curlew, golden plover and lapwing.

Collision mortality risks associated with the proposed turbine locations have been estimated, with risks predicted as not significant for any species. Despite this, a protocol, as approved by SLC in consultation with NatureScot, would be put in place for reporting and removal of all confirmed or suspected bird collision fatalities with the Proposed Development.

Potential construction disturbance effects and displacement effects during operation for golden eagle, red kite, curlew, golden plover and lapwing are also assessed and concluded as not significant. Furthermore, no significant cumulative effects are predicted when considering the Proposed Development in combination with other consented or in planning wind farm developments.

Mitigation, including the appointment of an ECoW, completion of pre-commencement surveys and implementation of a Bird Disturbance Management Plan (BDMP), would enable the protection of birds during construction and operational maintenance works associated with the Proposed Development.

An operational livestock carcass monitoring and recovery protocol is proposed as an additional specific mitigation measure to further reduce the potential risk of collision mortality for red kite and golden eagle during the operational phase.

In addition to habitat reinstatement following construction, the Proposed Development would deliver long-term beneficial habitat enhancement measures through the BEMP (**Technical Appendix 6.7 of EIAR Volume 4**). These measures would serve to improve nesting and foraging opportunities for bird species, their habitats and wider biodiversity and would include enhancement of areas away from operational infrastructure.

During operation, monitoring would be used to ensure that habitat management measures remain effective and meet the aims and objectives of the BEMP over the operational lifetime of the Proposed Development.

Overall, residual effects upon all identified birds are predicted to be not significant as a result of the Proposed Development alone, or in combination, with other wind farm developments.

Hydrology, Hydrogeology and Geology

Chapter 8: Hydrology, Hydrogeology and Geology (EIAR Volume 2) considered the likely significant effects on hydrology, hydrogeology, geology and soils associated with the construction, operation and decommissioning of the Proposed Development.

The assessment considered the effects on water quality, flood risk and flow and geomorphological characteristics of watercourses as a result of watercourse crossings, and the potential for effects on carbon rich soils and deep peat, including potential for peat landslide effects. The assessment was informed by a desk-based assessment, hydrological surveying and peat depth surveys.

The Site, including access tracks and proposed turbine locations, is within the River Clyde catchment. Watercourses within the Site boundary include Glengonnar Water, Laggen Gill, Kirk Gill, Glencaple Burn, Glenkip Burn and Glendorch Burn, with Elvan Water and Shortcleuch Water located immediately south of the Site boundary. Multiple unnamed watercourses are also present on the Site, including a number of watercourses crossed by existing circular culverts.

SEPA Flood Risk mapping indicates that there is minimal risk of fluvial flooding to the majority of the Site. Areas shown to have an elevated risk of flooding are generally confined to the immediate vicinity of watercourses, including areas adjacent to Glengonnar Water and Glencaple Burn. Parts of the proposed access route running parallel to Glengonnar Water are also shown to be at an increased chance of river flooding, although existing watercourse crossings along existing tracks would reduce flood risk and are not represented in SEPA national-scale mapping.

NVC habitat surveying confirmed that areas of the Site are classified as potentially Groundwater Dependent Terrestrial Ecosystems (GWDTE), and further assessment has been undertaken to determine the

likelihood of groundwater dependency and sensitivity. The majority of the Site is within a Low productivity aquifer, with an area of Highly productive aquifer located immediately northwest of the Site. Private Water Supply (PWS) registers indicate that 15 PWS end users are recorded within 2 km of the Site boundary, with four located on Site, and further PWS sources identified during the Site walkover and from consultation with the landowner.

The superficial geology underlying the Site predominantly comprises Devensian Till (Diamicton) and peat deposits, with small areas of alluvium present in proximity to burns and watercourses. A Geological Conservation Review Site and Site of Special Scientific Interest (SSSI) known as Raven Gill is located in the northeast portion of the Site; no aspect of the Proposed Development is proposed within this area.

Peat depth surveys across the Site found that the majority of the Site is either absent of peat or, where organic soils are present, they are relatively shallow (less than or equal to 0.5 m in depth for 83% of samples); approximately 97% of probes recorded peat depths less than or equal to 1 m. Most of the infrastructure has been located in areas where peat is expected to be absent or 0.5 m or less, with sections of floating access track proposed in the area west of T16 and north of T21 where it has not been possible to completely avoid deep peat.

The Proposed Development has been sited outwith areas of mining instability or associated contamination where practicable through the design process. Mitigation has been applied to areas of the Site where historical mining and contamination risks are present.

Throughout the design of the Proposed Development, consideration has been given to avoiding or minimising adverse effects on hydrological, geological and hydrogeological receptors. This includes minimising the number of watercourse crossings, maintaining buffers from watercourses where practicable and from PWS, and locating infrastructure away from deeper peat where practicable. Watercourse crossings would be designed to maintain hydraulic connectivity,

convey flows during periods of heavy rainfall, and comply with the Environmental Authorisations (Scotland) Regulations (EASR). The Proposed Development would incorporate drainage design using SuDS principles, with construction phase measures set out in the CEMP and Pollution Prevention Plan (PPP) and implemented under the supervision of an ECoW where required.

The assessment concluded that, during construction, no significant adverse effects are likely to occur in relation to watercourses, flood risk, or water quality, as works would be carried out in accordance with the CEMP and PPP, including SuDS measures and pollution prevention measures, and with watercourse crossing works regulated under the EASR. Water quality monitoring would be undertaken pre-construction, during and post-construction to demonstrate that the Proposed Development does not cause water pollution, and to enable mitigation action to be taken if required. No hydrogeological effects are anticipated on PWSs, and the quality and quantity of water supplies would be maintained via best practice measures contained in the CEMP.

Image: Hershaw Burn Watercourse



In relation to peat and carbon rich soils, no significant adverse effects are likely to occur as construction would be carried out in accordance with the Peat Management Plan (PMP), the Peat Landslide Hazard Risk Assessment and good practice measures detailed in the CEMP, along with micro-siting to avoid deeper peat where possible in the event that unexpected pockets of deep peat are encountered. A peat landslide hazard risk assessment concluded that the Site is generally of low or very low risk, with a small number of access track locations identified as moderate risk where specific mitigation would be applied and confirmed at the detailed design stage.

During the operational phase of the Proposed Development, no significant adverse effects are likely to occur. Maintenance of access tracks, drainage systems and turbines would be undertaken in line with operational management procedures, including maintenance of SuDS and drainage assets to ensure continued effective operation and to prevent flow disruptions and associated flood risk or sediment transport. Monitoring would continue through Site walkovers and inspections by a geotechnical specialist to check for unexpected ground disturbance in relation to peat landslide risk and mining risk, with continued water quality monitoring where required.

No significant cumulative construction, operational or decommissioning effects are predicted. The cumulative assessment identified Clyde Wind Farm as the only scheme within 5 km of the Site and concluded there is a very low likelihood of cumulative effects due to distance, the limited productivity of aquifers in the area and the requirement for all developments to implement drainage design, pollution prevention and environmental management procedures.

Traffic and Transport

Chapter 9: Traffic and Transport (EIAR Volume 2) presents the assessment of the likely significant environmental effects of traffic and transport associated with the construction, operation and decommissioning of the Proposed Development. Both operational and decommissioning effects were scoped out of the assessment as no likely significant effects were predicted.

A series of paths are located within the Site and the surrounding area, including a number of core paths within the Site boundary. It is proposed that the provision of new tracks and upgrading of existing tracks within the Site would lead to an enhancement of the existing recreational provision, with mitigation measures during construction including provision of crossing points, appropriate signage and on-site training.

The likely Port of Entry used for delivery of the wind turbine components would be Glasgow King George V (KGV) Docks. Abnormal Indivisible Loads (AILs) would route to the Site via the strategic road network, including the M8, M74, A74(M), M6, Junction 42 Golden Fleece, M6 and A74(M), with access to the Site provided via a newly proposed construction access from the A74(M) northbound near Abington.

Image: Abnormal Indivisible Load (AIL) Vehicle for Turbine Delivery



Baseline conditions confirm that the road network within the Study Area comprises the B797, C16 Crawfordjohn Road, A702 and the A74(M)/M74, with existing traffic levels generally low on local roads and substantially higher on the motorway network. Traffic accident records indicate no existing road safety issues within the Study Area that would be exacerbated by the Proposed Development.

During the construction phase, there would be a temporary increase in traffic flows, including HGVs and AILs, particularly on the B797 and A702. Construction traffic would be routed to avoid through traffic impacting on the surrounding villages as far as practicable. Peak construction activity is expected to occur over a short period and the assessment indicates that sufficient road capacity exists within both the local and strategic road network to accommodate construction traffic without capacity issues.

Mitigation measures would be implemented through a Construction Traffic Management Plan (CTMP), an AIL Transport Management Plan, an Outdoor Access Management Plan (OAMP) and a Staff Travel Plan. These measures would include agreed delivery routes and timings, traffic management at Site access points, police escort for AILs, communication with local communities and temporary and permanent diversions of paths where required.

Taking account of the proposed mitigation, the assessment concluded that no significant effects are predicted in relation to traffic and transport during construction. Traffic associated with the operational phase would be minimal and related to maintenance activities only, while traffic during decommissioning would be less than during construction and is therefore also considered not significant.

Noise

Chapter 10: Noise (EIAR Volume 2)

presents the assessment of the likely significant effects on noise sensitive receptors (NSRs) as a result of the construction and operational phases of the Proposed Development.

Baseline conditions were determined from historical baseline data and a new noise survey undertaken at one location to establish a representative baseline noise dataset for noise-sensitive receptors surrounding the Site. The baseline data was used to inform the construction noise assessment and to set the operational noise limits for the Proposed Development.

Noise modelling for construction activities indicates that most construction activities would result in negligible to minor effects at nearby receptors due to the separation distances involved. The exception relates to Site access track and road verge reinstatement works closest to receptors in the north, where noise levels could result in a moderate effect without mitigation for a short period. Construction vibration effects are predicted to be minor and not significant.

Mitigation in the form of good practice during construction is recommended to keep noise to a minimum and would be included in a site-specific Noise Management Plan as part of the CEMP. In addition, specific mitigation is proposed for access track and road verge works closest to northern receptors, including the use of screening, liaison with residents, use of quieter methods where practicable, restricting the duration of higher noise activities, and noise monitoring during these works.

Construction traffic noise was assessed as part of the overall construction assessment and, taking account of the temporary nature of construction activities and the proposed management measures, is not expected to result in significant effects.

The assessment of likely operational noise effects indicates that predicted wind turbine noise levels would comply with the derived noise limits at all receptors when using the specified turbine operation modes where required. Cumulative operational noise was also assessed in combination with nearby wind farms and was found to be compliant with the derived limits. Noise from the substation and BESS is predicted to be negligible at the nearest receptor due to the separation distance.

Operational mitigation would include the use of reduced noise operation for specific turbines, where required, to ensure compliance with the derived noise limits. The final turbine model would be operated in compliance with the operational noise limits specified in any planning conditions, and a complaint-led monitoring approach would be used, if required, to demonstrate compliance.

With embedded and additional mitigation in place, residual effects from construction, operation and decommissioning are assessed as minor or negligible and not significant in EIA terms, and no significant residual cumulative effects have been identified.

Image: Glengaber Hill



Aviation

Technical Appendix 2.3: Aviation (EIAR Volume 4) presents the assessment of the likely significant effects as a result of construction, operation and decommissioning of the Proposed Development in relation to aviation receptors and stakeholder interests. The aviation assessment focused on the effects of the Proposed Development on military low flying, Prestwick Airport Instrument Flight Procedures (IFPs) and the air traffic control Primary Surveillance Radars (PSRs) at Lowther Hill and Cumbernauld.

Wind turbines with a tip height in excess of 150 m are required to be illuminated with aviation obstruction lighting in accordance with the Air Navigation Order and Civil Aviation Authority (CAA) Policy Statement: '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'⁹. The Proposed Development comprises turbines with a maximum tip height of 220 m and will therefore require lighting. The Applicant has committed to implementing turbine lighting in accordance with CAA requirements and to seeking approval for a reduced lighting scheme, which would remove tower lights and reduce the number of visible nacelle lights. The Applicant also commits to installing infra-red lighting on turbines to meet Ministry of Defence (MoD) requirements for military low flying.

The Site is located within a military Low Flying Area where fixed-wing aircraft may operate at low altitude. Effects on low flying military aircraft during construction, operation and decommissioning are not considered to be significant, as the Proposed Development would be charted and lit in accordance with civil and military aviation requirements, including the use of infra-red lighting, which would ensure turbine visibility to military aircraft at night.

In relation to aerodromes, the Proposed Development is located at distances such that no effects are predicted on the obstacle limitation surfaces or Primary Surveillance Radars of Glasgow Airport, Glasgow Prestwick Airport or Edinburgh Airport. Initial concerns raised by Prestwick Airport in relation to its Instrument Flight Procedures have been resolved following the increase in the relevant procedure minimum altitude, and provided turbine heights remain below the agreed elevation threshold, no significant effects on Prestwick Airport IFPs are predicted.

The Proposed Development is within radar line of sight of NATS¹¹ (En Route) (NERL) Primary Surveillance Radars at Lowther Hill and Cumbernauld. Without mitigation, turbine blades could generate false radar returns with the potential to affect the air traffic service provided by NATS. Mitigation is available using established radar processing techniques, either through optimisation of the Lowther Hill radar system or by blanking and infill within the Multi-Radar Tracking system. With this mitigation in place, effects on these radars are assessed as not significant.

Effects on Secondary Surveillance Radar and air-ground-air communications infrastructure have been assessed and are not predicted to have a detrimental impact on the air traffic service provided in controlled airspace.

Overall, with committed mitigation in place, no significant residual effects are predicted in relation to aviation during construction, operation or decommissioning, and no significant cumulative effects have been identified.

⁹ <https://www.caa.co.uk/publication/download/16178>

¹⁰ National Air Traffic Services (NATS)

Shadow Flicker

Technical Appendix 2.5: Shadow Flicker (EIAR Volume 4) presents the appraisal of the likely impacts on residential amenity from shadow flicker, caused by the moving shadow of the turbine rotor being cast over a narrow opening, such as a window or open door, associated with the operation of the Proposed Development.

The appraisal used proprietary specialist modelling software 'Windfarm' (RESOFT Windfarm V5.0.2.2) to analyse shadow flicker for the Proposed Development taking into account the behaviour of the sun, the local topography and the turbine layout and dimensions. Impacts are considered likely where shadow flicker would exceed 30 minutes per day or 30 hours per year, or both, in line with recognised guidance.

Five residential properties are located within the shadow flicker study area. Of these, two properties have the potential to experience shadow flicker in excess of 30 minutes per day, although predicted annual exposure at all properties is below 30 hours per year once an adjustment for typical sunshine levels is applied. The remaining three properties would experience shadow flicker levels below accepted daily and annual thresholds.

Prior to the erection of the first turbine, a Wind Farm Shadow Flicker Protocol would be submitted to and approved by South Lanarkshire Council. The protocol would set out the procedure to be followed in the event that a shadow flicker complaint is received from a property within the study area and would identify appropriate mitigation measures. These measures may include the provision of internal or external screening at the affected property or programming of turbines to reduce effects. Operation of the Proposed Development would be undertaken in accordance with the approved protocol.

With appropriate mitigation measures implemented through the Wind Farm Shadow Flicker Protocol, residual shadow flicker effects during operation of the Proposed Development would be reduced to below accepted threshold levels, ensuring that potential impacts on residential amenity could be reduced to an acceptable level.

Image: East of the Hass



Summary

As a result of a combination of environment-led design mitigation and the implementation of standard/best practice and specific mitigation and management measures, the EIAR concludes that the likely significant environmental effects associated with the Proposed Development, alone and in addition to other wind farm developments, are limited to landscape and visual effects (in terms of change to the physical landscape within the Site, degradation to characteristics of surrounding landscapes and change to views as a result of the Proposed Development) during construction and operation and the setting effect on the Waterhead, platform settlement Scheduled Monument located within the Site.

With the implementation of mitigation measures no significant effects are identified in relation to ecology, ornithology, hydrology, hydrogeology, geology and soils, traffic and transport, noise, aviation and shadow flicker.

