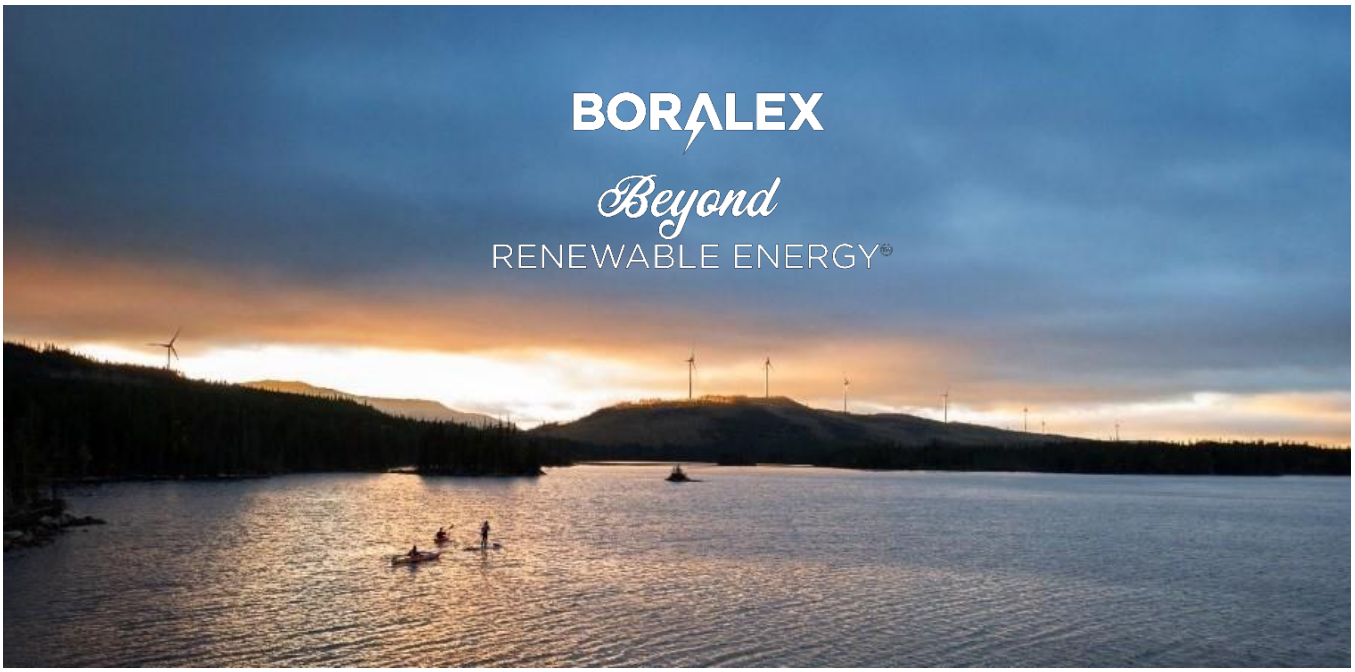


Shepherds' Rig Wind Farm Section 36C

Environmental Impact Assessment Report

Non-Technical Summary

Contents

1. Introduction

1.1. Background

1.1.1. This document is a Non-Technical Summary (NTS) of the Environmental Impact Assessment (EIA) Report which accompanies an application made by SETT Wind Development Limited (the Applicant).

1.1.2. The Applicant is applying to Scottish Ministers for Section 36C (S36C) consent under the terms of the Electricity Act 1989 and the Town and Country Planning (Scotland) Act 1997, for permission to vary the original Section 36 consent and deemed planning permission granted in August 2023, for Shepherds' Rig Wind Farm (hereafter referred to as the "Proposed Varied Development"). This site is located approximately 5 kilometres (km) to the east of Carsphairn and 10 km north of St John's Town of Dalry, in northern Dumfries and Galloway, as illustrated on **Figure 1**.

1.1.3. The Proposed Varied Development will comprise approximately 127 megawatts (MW) of renewable energy generation and storage output capacity from the following:

- Approximately 77 MW generated from wind turbines; and
- Approximately 50 MW of battery energy storage.

1.1.4. Renewable energy is a key factor in helping Scotland reach its target of Net Zero by 2045. The Proposed Varied Development would make a meaningful contribution to national targets for the generation of renewable energy, the provision of energy storage, and reduction in greenhouse gas emissions and contribute towards sustainable economic growth both in Dumfries and Galloway, and Scotland as a whole.

1.2. Purpose of the Proposed Varied Development EIA Report

1.2.1. SLR Consulting Limited (SLR) was appointed by the Applicant to assess the environmental impacts of the Proposed Varied Development in accordance with The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.2.2. The EIA process is reported in an EIA Report, which describes the methods used to assess the beneficial and adverse environmental impacts predicted to result from the construction, operation and decommissioning of the Proposed Varied Development. Where appropriate, it also sets out mitigation and enhancement measures designed to prevent, reduce and, if possible, offset any significant adverse environmental impacts as well as delivering biodiversity enhancement. An assessment of residual effects, those expected to remain following implementation of mitigation measures, is also presented. This document is intended to present a summary of the findings of the EIA Report in non-technical language.

2. Project History

2.1.1. Shepherds' Rig Wind Farm has been developed through a number of design stages over several years. The original Scoping Report was submitted in 2013, seeking feedback on a scheme of up to 45 turbines with a maximum tip height of approximately 150 metres. Design work and environmental assessments were carried out to balance environmental sensitivities with project viability, before the project was placed on hold in 2015.

2.1.2. Development resumed in 2018 following a review of the project's economic viability and updated environmental survey work. An updated Scoping Report was submitted based on a reduced layout of up to 30 turbines. Continued design refinement and environmental assessment led to the submission of an EIA Report in November 2018 in support of an application for 19 turbines, comprising 17 turbines at 149.9 m (height from ground to tip of blade) and two turbines at 125 m.

2.1.3. Following consultation on this application, additional environmental information was submitted to account for further design changes to address consultation feedback, most notably reducing the scheme to 17 turbines (15 turbines at 149.9 m and two turbines at 125 m). Shepherds' Rig Wind Farm (referred to as the 'Consented Development') was granted Section 36 consent on the basis of this revised design in August 2023 following a Public Inquiry. A copy of the Consented Development's decision letter is included in Volume 2, **Appendix 1.1** of the EIA Report.

2.1.4. All application documentation in support of the Consented Development can be accessed at https://www.shepherdsrigwindfarm.co.uk/.

2.2. Variation Rationale

2.2.1. Following consent, the Applicant has calculated that the energy yield of the Consented Development can be increased by approximately 53% by increasing the height of the proposed turbines. This increase in turbine height, together with the reduction in turbine numbers, would only result in limited changes to environmental effects (as outlined within Volume 1, **Chapters 7 - 18** of the EIA Report). These primary factors have encouraged the Applicant to seek consent for a variation to the Consented Development, as outlined in the EIA Report.

2.2.2. The increased yield would enable the Proposed Varied Development to make an even greater contribution to UK and Scottish Government climate change and renewable energy targets and commitments.

3. Availability of the Proposed Varied Development EIA Report

3.1.1. Hard copies of the EIA Report are available from:

Boralex

The Auction House

63a George Street

Edinburgh EH2 2JG

Email: info@shepherdsrigwindfarm.co.uk

Freephone: 0800 980 4299

Website: https://www.shepherdsrigwindfarm.co.uk/

3.1.2. Printed copies of the NTS are available free of charge from the Applicant. The cost of a hard copy of the EIA Report Volumes 1 to 4 is £1,500. In addition, all documents are available (as a PDF for screen viewing) on a DVD/USB free of charge while stocks last. The price of the hard copy reflects the cost of producing all of the Landscape and Visual graphics and visualisations at the recommended size. As such, a DVD/USB version is recommended.

3.1.3. Copies of the EIA Report and NTS will also be available for viewing during opening hours at the following locations:

- **Lagwyne Hall**, Main Street, Carsphairn, DG7 3TQ;
- **Castle Douglas Library**, Customer Service Centre, Market Hill, King Street, Castle Douglas, DG7 1LU; and
- **Dumfries and Galloway Council Customer Services**, Kirkbank House, English Street, Dumfries, DG1 2HS.

3.1.4. The application documents including the EIA Report can be accessed at http://www.energyconsents.scot/ (reference number **ECU00005137**) or at https://www.shepherdsrigwindfarm.co.uk/.

4. Representations to the Application

4.1.1. Any representations to the application should be submitted via www.energyconsents.scot, using the relevant project name, Shepherds' Rig Wind Farm, and/or the Energy Consent's Unit (ECU) reference number ECU00005137. Please note that you must be in possession of a working email address to submit a representation electronically.

4.1.2. If you would prefer to submit your representation by post, please send to the Scottish Government at:

Energy Consents Unit

5 Atlantic Quay

150 Broomielaw

Glasgow

G2 8LU

4.1.3. Written representations should be dated, clearly stating the name (in block capitals) and full postal address of those making representation.

5. Site Description and Design

5.1. Site Description

5.1.1. The site remains the same as that of the Consented Development and is located approximately 5 km to the east of Carsphairn and 10 km north of St John's Town of Dalry, in a rural area of northern Dumfries and Galloway.

5.1.2. The site was identified and secured for development between 2011 and 2012, following feasibility work which confirmed its suitability for a wind farm. It was then taken forward to the EIA and detailed design stage due to a combination of favourable environmental, technical and operational characteristics.

5.1.3. The site comprises approximately 752 hectares (ha) of commercial coniferous woodland plantation of smooth rolling topography, peaking at Craigengillan Hill in the north of the site, which reaches approximately 401 m above sea level, and Marscalloch Hill on the south-western boundary, rising to around 381 m.

5.1.4. The site contains several small watercourses, including the Water of Ken and its tributaries such as Black Burn, Craigengillan Burn and Dry Burn, which flow through different parts of the site. The Craigengillan burial cairn, which is a Scheduled Monument, lies within the plantation within the north-eastern part of the site. The Galloway Hills Regional Scenic Area (RSA) lies immediately to the west of the site, with a small part of the western edge of the site overlapping this designation.

5.1.5. There are a number of forestry tracks within the site, with a main southern access point on the B729 between Muirdrochwood and Smittons Bridge. As with the Consented Development, the Proposed Varied Development's design has sought to utilise the existing forestry tracks as far as practical.

5.1.6. The surrounding area is characterised by upland landscapes, including the Glenken Valley to the south-west, which contains lochs, hydro schemes, and key routes such as

the A713. The landscape rises to notable hills and ranges nearby, including the Rhinns of Kells and Cairnsmore of Carsphairn, while a mix of open moorland and forestry plantations surrounds the site. The wider area includes recreational routes such as the Southern Upland Way, which passes to the east of the site, as well as scattered rural dwellings, with the nearest properties located just under 1 km from the closest turbines. There are also several operational wind farms in the surrounding area.

5.2. Design Process and Alternatives

5.2.1. The Applicant considered a number of design iterations over a five-year period before reaching the finalised design of the Consented Development, starting from an initial 45 turbine layout in 2013 and ending with the consented layout of 17 turbines in 2019. The design evolution for the Consented Development is outlined in Chapter 3 of the 2018 EIA Report and Chapter 3 of the 2019 Additional Environmental Information (AEI) Report, which was submitted by the Applicant in response to consultee feedback to the 2019 EIA Report.

5.2.2. The layout of the Proposed Varied Development has been an iterative process which started in March 2024, each time taking into consideration information gathered through site assessments or comments from consultees, as well as the professional judgement of technical experts. The following principles were adopted during the design iterations made by the Applicant to ensure that the final design of the Proposed Varied Development was the most suitable for the site:

- Minimise the number of variations required from the Consented Development.
- Create a scheme which maximises the potential of the site to generate renewable energy, while respecting technical and environmental constraints as noted below.
- As far as possible in consideration of other physical and environmental constraints, avoid inconsistent turbine spacing, such as relatively large gaps, outliers or excessive overlapping turbines to minimise visual confusion and ensure a balanced / compact array from key views.
- Maintain suitable inter-turbine spacing to ensure safe and efficient operation of the turbines.
- Maximise distance between turbines and residential properties as far as possible.
- Minimise setting impacts on nearby cultural heritage assets, including Craigengillan Cairn, Stroanfreggan Craig fort and Stoanfreggan Bridge Cairn.
- Avoid of areas of deep peat wherever possible.
- Avoid siting turbines on steep slopes.
- Avoid siting turbines and other infrastructure on blanket bog habitat; avoid other sensitive habitats wherever possible.
- Minimise forestry felling requirements.

- Maintain suitable buffers around identified bird breeding sites as appropriate.
- Maintain at least a 500 m buffer from Craigengillan Cairn.
- Maintain a 50 m buffer around watercourses except where crossings are required.
- Maintain suitable buffers from proposed overhead line infrastructure.
- Use existing infrastructure as far as practicably possible.

5.2.3. The Applicant has considered a number of alternative layouts for the Proposed Varied Development. The Proposed Varied Development layouts have taken account of identified technical and environmental constraints building on from the assessment work undertaken for the Consented Development, based on desk-based study and walkover survey work, as well as preliminary wind yield analysis and the opinions of statutory and other interested stakeholders on the proposals being put forward through a formal Scoping process with Scottish Government as well as direct consultation.

5.2.4. The final design layout comprises 11 turbines, six fewer than the Consented Development. Full details of the design iteration process can be found in Volume 1, **Chapter 3** of the EIA Report.

6. The Proposed Varied Development

6.1.1. The primary purpose of the Section 36C variation is to reduce the number of turbines (and associated hardstandings) of the Consented Development, whilst increasing the height of the remaining turbines. The Consented Development included 17 wind turbines with 15 turbines at a maximum tip height of 149.9 m and two turbines at a maximum tip height of 125 m. The Proposed Varied Development would comprise eleven wind turbines at a maximum tip height of 220 m.

6.1.2. In addition to a reduction in the number of turbines, and an increase in maximum tip height, the Applicant is proposing to:

- Increase the size of associated crane hardstandings to accommodate the larger turbines;
- Relocate eight turbines beyond the micrositing allowance of the Consented Development, but within the same pattern of development;
- Amend parts of the track layout to reflect turbine removal and relocation (as outlined above);
- Change to the number and location of required watercourse crossings to accommodate the amended track layout;
- Increase the size and capacity of the associated Battery Energy Storage System (BESS);

- Relocate the temporary construction compound sightly beyond micrositing allowance;
- Remove the previously proposed permanent anemometer mast; and
- Increase the operational lifetime of the development from 30 to 40 years.

6.1.3. The layout of the Consented Development in comparison to the Proposed Varied Development is shown on **Figure 2**. Three of the Proposed Varied Development's turbine locations remain unchanged or within the micrositing allowance for the Consented Development. Locations of four turbines are within 200 m of a consented turbine position, whilst the remaining four turbines are over 200 m from a consented turbine position but located within the same pattern of development. No turbine is proposed further than 500 m from a consented location.

6.1.4. The Proposed Varied Development will comprise up to eleven wind turbines, each up to 220 m blade tip height, as well as associated infrastructure. Its total generating capacity is anticipated to be approximately 77 megawatts (MW), an increase of 6.8 MW from the Consented Development. The Proposed Varied Development also includes a battery energy storage system (BESS), with an output capacity of 50 MW, an increase of 44 MW from the Consented Development.

6.1.5. In addition to the turbines and BESS, associated elements of the proposal will include:

- turbine foundations;
- crane hard standings;
- on-site access tracks between turbines and from the point of access to the turbines;
- watercourse crossings;
- on-site substation and maintenance building with welfare facility and associated communications equipment;
- on-site electrical cabling between the turbines and the substation and BESS;
- a temporary construction compound;
- a temporary concrete batching plant;
- two borrow pits to provide aggregate for the construction of the development; and
- habitat enhancement areas including forest to bog peatland restoration and native planting.

6.1.6. The layout for the Proposed Varied Development is shown on **Figure 3**.

6.1.7. Although the infrastructure layout and locations of the tracks, substation etc. have been determined through an iterative environmental-based design process (refer to **paragraphs 5.3.1 to 5.3.4**), there is the potential for the precise locations to be altered

through micro-siting prior to or during construction. A micro-siting allowance of up to 100 m in all directions is being sought in respect of all infrastructure, to suitably respond in the event that pre-construction surveys identify unsuitable ground conditions or environmental constraints that could be avoided by relocation. This is an increase of 50 m from the Consented Development, to allow for greater flexibility in siting the larger infrastructure.

6.2. Wind Turbines

6.2.1. The Proposed Varied Development comprises up to eleven wind turbines as well as associated infrastructure, up to 220 m maximum blade tip height. Each turbine will have a generating capacity of approximately 7 MW and a rotor diameter of approximately 163 m for all wind turbines.

6.2.2. A number of ancillary development components are also proposed, including: a temporary construction compound, hardstandings adjacent to the wind turbines for construction, maintenance and decommissioning cranes, access tracks, watercourse crossings, underground electrical cables between infrastructure, a temporary concrete batching plant and two borrow pits.

6.2.3. As the turbine structures are over 150 m high, there is a statutory requirement to install visible aviation lighting on the turbines, as such it is proposed that six of the turbines (turbines 1, 4, 5, 6, 7 and 11) will be installed with visible aviation lighting. As discussed in **Section 12.2**, mitigation is proposed for aviation lighting on the turbines, allowing light intensity to be reduced to limit night-time visibility.

6.3. BESS

6.3.1. The electricity substation and BESS compound would comprise an 'L' shaped, fenced hardstanding area. This compound would house electrical equipment, the BESS facility and three single storey control buildings. The control buildings would house switchgear, metering, protection and control equipment as well as welfare facilities.

6.3.2. The BESS facility will efficiently store electricity generated from the wind turbines for future use when the National Grid requires it. The BESS would have an approximate maximum electricity storage capacity of 50 MW. The location of the proposed BESS facility remains the same as the Consented Development, however the overall footprint has increased to accommodate the proposed larger capacity. The BESS facility will include containerised battery units, switchgear and transformers units, storage containers and a water storage tank. The indicative height of the battery units themselves would be approximately 5 m, unchanged from the Consented Development.

6.3.3. The substation and BESS compound will include access tracks and car parking and will be surrounded by a security fence up to 2.5 m in height and CCTV will be deployed as a security measure. The CCTV will be mounted on posts each measuring up to 4.5 m in height.

6.4. Access

6.4.1. The proposed site access point remains the same as the Consented Development and would be from a new access junction between Muirdrochwood and Smittons on the B729, entering the site from the south.

6.4.2. As with the Consented Development, a number of off-site road improvements will be required to facilitate turbine delivery, primarily along the B729 between Carsphairn and the site access. This has been considered in Volume 4, **Appendix 15.2** of the EIA Report.

6.4.3. A transport assessment (Volume 1, **Chapter 15** of the EIA Report) has been undertaken in support of the application for the Proposed Varied Development, and this provides greater detail on access routes to the site and provides an estimate of vehicle trip generation during construction. The transport assessment includes a review of the proposed abnormal load routes, and construction traffic impacts.

6.5. Grid

6.5.1. The proposed grid connection remains the same as the Consented Development. It is likely that the Proposed Varied Development would be connected into the national transmission system in the vicinity of Holm Hill near the A713, approximately 7 km to the north-west of the site, via a new pole-mounted overhead 132 kilovolt (kV) line currently subject to a Section 37 application by ScottishPower Energy Networks (SPEN) to connect Lorg Wind Farm. This proposed line would run through the central part of the Proposed Varied Development's site.

6.5.2. A short underground connection of approximately 200 m would link the Proposed Varied Development substation to the Lorg Wind Farm Grid Connection. This connection would be subject to a separate consenting process by SPEN. An assessment of the likely significant environmental effects resulting from this connection in combination with the Proposed Varied Development is presented in Volume 4**, Appendix 4.2** of the EIA Report. No potential for significant environmental effects arising from the Proposed Varied Development and its currently proposed grid connection route were identified. The final routing and design of this connection would be determined by SPEN.

6.5.3. The potential for cumulative effects arising from the Proposed Varied Development and the Lorg Wind Farm Grid Connection (the latter which is subject to a live Section 37 application as described above) has been considered, where relevant, within each technical assessment chapter (**Volume 1, Chapters 7–18**).

6.5.4. The Proposed Varied Development presently has an anticipated grid connection date of 2030.

6.6. Habitat Management and Enhancement

6.6.1. A Habitat Enhancement and Management Plan (HEMP) will be implemented during the life of the Proposed Varied Development which will offer opportunities for interrelated environmental enhancements at the site with respect to peat, biodiversity and forestry.

Key features of this plan include restoring 66.75 hectares of degraded blanket bog habitat by removing conifer plantation and implementing measures such as furrow blocking and ground smoothing, creating and managing dry heath and acid grassland habitats, establishing native broadleaved woodland, enhancing riparian zones to improve connectivity, and installing fencing to protect young trees.

6.6.2. An outline HEMP is included as **Appendix 9.8** of Volume 4 of the EIA Report**,** which provides further detail on these proposed management measures. This represents a significant increase in proposed biodiversity enhancement measures compared to that associated with the Consented Development.

6.7. Summary

6.7.1. A summary of the changes between the Consented Development and the Proposed Varied Development are summarised in **Table 1** below.

Table 1 - Summary of Key Changes between the Consented Development and the Proposed Varied Development

	Consented Development	Proposed Varied Development	Summary of Key Changes
Maximum Number of Turbines	17	11	Removal of six turbines
Maximum Turbine Tip Height	125 m and 149.9 m	220 m	Increase in maximum tip height up to 95 m
Turbine Foundations	500 m^3 of concrete per turbine	1,440 m^3 of concrete per turbine	Increase of 940 m^3 per turbine
Crane Hardstanding	1,780 m^2 per turbine	3,202 m^2 per turbine	Increase of 1,422 m^2 per turbine
On-site Access Track Length	11 kilometres (km) - 9 km new and 2 km existing	10.3 km – 7.7 km new and 2.6 km existing	Reduction of 0.7 km in total track length and 1.3 km in new track construction.
Temporary Construction Compound	100 m x 50 m	100 m x 50 m	Relocated approximately 65 m south and rotated 90 degrees anti-clockwise.

	Consented Development	Proposed Varied Development	Summary of Key Changes
Substation and BESS Compound	3,480 m^2 Total BESS capacity of 6 MW	10,890 m^2 Total BESS capacity of 50 MW	Increase in area by 7,410 m^2 and increase in BESS capacity of 44 MW
Borrow Pits	2	2	No change.
Watercourse Crossings	10	7	Reduction of three watercourse crossings.
Permanent Anemometer mast	1	0	Anemometer mast no longer required.
Micrositing Allowance	50 m	100 m	Increase of 50 m
Operational lifetime	30 years	40 years	Increase of 10 years
Total Generation Output	70.2 MW	77 MW	Increase of 6.8 MW
Total Maximum Output	76.2 MW	84.6 MW*	Increase of 8.4 MW
Estimated Energy Yield (P50)	158.00 GWh/year	241.34 GWh/year	Increase of approximately 53%

***It should be noted that although the Proposed Varied Development comprises 127 MW of renewable energy, no more than 84.6 MW will be exported to the grid at any one time. This is limited by grid connection capacity.**

7. Construction

7.1.1. Normal construction hours will be between 07:00 and 19:00 Monday to Friday and 07:00 and 13:00 on Saturdays. These times have been chosen to minimise disturbance to local residents. It must, however, be noted that out of necessity due to weather conditions and health and safety requirements, some generally quiet activities, for example abnormal load deliveries (which are controlled by Police Scotland) and the lifting of the turbine components, may occur outside the specified hours stated. Any construction outwith these hours will be in line with the noise limits as assessed in **Volume 1, Chapter 14** of the EIOA Report and advance warning of any works outwith the agreed working hours will be provided to DGC and local residents.

7.1.2. A fully detailed construction programme will be provided in a Construction Environmental Management Plan (CEMP) prior to the commencement of construction. The on-site construction period for the Proposed Varied Development is expected to be approximately 21 months as shown in **Table 2.**

Table 2 – Indicative Construction Programme

Task	Year 1 (quarters)				Year 2 (quarters)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mobilisation, Felling and Remedial Works	■	■	■					
Access & Site Tracks			■	■				
Foundations			■	■	■			
On-site Cabling			■	■	■			
Substation & BESS			■	■	■			
Crane Hardstanding				■	■			
Turbine Delivery					■	■		
Turbine Erection						■	■	
Commissioning & Testing							■	
Site Reinstatement							■	

7.1.3. The operational lifespan of the Proposed Varied Development would be 40 years, after which it would be appropriately decommissioned. It is expected that decommissioning would take approximately eight months. If, after the operational lifespan of the Proposed Varied Development has expired there is potential for re-powering the development, this would be subject to a new and separate application.

8. Community Benefit Contribution

8.1.1. Based on a total installed wind energy capacity of 77 MW and a community benefit contribution of £5,000 per MW of installed wind energy capacity, the Proposed Varied

Development could generate up to £385,000 per annum to support local groups and projects in the areas surrounding the site. This marks an increase of £34,000 per annum from the Consented Development. With the proposed increase of operational lifetime of the Proposed Varied Development from 30 to 40 years, this would equate to an additional £4.87 million over the Proposed Varied Development's lifetime compared to the Consented Development.

9. Consultation

9.1. Statutory Consultation

9.1.1. Consultation is a key component of the EIA process. In order to inform the EIA, there has been ongoing consultation with statutory consultees, engagement through correspondence and meetings, as required. This consultation has built upon that already undertaken for the Consented Development.

9.1.2. A range of consultation activities have been conducted throughout the EIA process to engage with both statutory and non-statutory consultees as well as stakeholders potentially affected by the Proposed Varied Development. A formal EIA Scoping Opinion was requested from the Scottish Government ECU in July 2024 through the submission of an EIA Scoping Report. The EIA Scoping Report contained details of the site baseline, the Proposed Development, proposed environmental impacts to be assessed in the EIA, and the assessment methodologies that would be used. The ECU consulted with a variety of statutory and non-statutory consultees before providing an EIA Scoping Opinion in November 2024.

9.1.3. A summary of how the Scoping responses received would be addressed in this EIA Report was provided to the ECU within an EIA Gatecheck Report in January 2025, and updated EIA Gatecheck Report in April 2026.

9.1.4. Direct consultation has also been undertaken with specific statutory consultees, to confirm and agree the detailed approach to the technical surveys and assessments on a topic by topic basis.

9.1.5. Further information on the consultation process is given in Volume 1, **Chapter 6** of the Proposed Varied Development EIA Report.

9.2. Public Consultation

9.2.1. The Applicant has been engaged in dialogue with the local community council and residents since the Shepherds' Rig Wind Farm project was originally launched in 2013. Community consultation is at the centre of the Applicant's approach to development, not only in the pre-application stage, but also throughout the life of the project. This is delivered through direct (either in-person or virtual) contact with local community councils, an online consultation website (www.shepherdsrigwindfarm.co.uk), a freephone telephone number (0800 980 4299), dedicated project email address

(info@shepherdsrigwindfarm.co.uk), newsletters, Community Open Days (or virtual events) and advertisements/editorial in local newspapers.

9.2.2. Three rounds of in-person public exhibitions took place in September 2024, March 2025 and March 2026. The Round 1 exhibition outlined the draft proposal for the site with the aim to gain initial feedback. The Round 2 and 3 exhibitions intended to inform the local community of the design changes which had been made and demonstrate how the Applicant had considered the comments received to date.

9.2.3. A stand-alone Pre-Application Consultation (PAC) Report has been prepared which gives details of the correspondence, online and in-person public consultation and other discussions which have taken place with the communities closest to the Proposed Varied Development site.

9.2.4. The Applicant is grateful to residents and local representatives for their input into the pre-application community engagement process and for their participation in the discussions and will continue to liaise with the local community during the S36C application process.

10. The EIA Process

10.1.1. EIA is a process that aims to ensure that permissions for developments with potentially significant effects on the environment are granted only after the assessment of likely significant environmental effects has been undertaken. The assessment must be carried out following consultation with statutory consultees, other interested bodies and members of the public.

10.1.2. EIA is an iterative process of assessment and deign whereby prediction and assessment of effects inform the design of the Proposed Varied Development. The Proposed Varied Development can then be refined in order to avoid or reduce potential environmental effects, where necessary, through the use of mitigation measures.

10.1.3. The EIA Report has been prepared following a systematic approach to EIA and project design. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. The key elements in an EIA are:

- Iterative project design, taking feedback from consultation and applying it to the design process on an ongoing basis throughout the EIA process;
- Scoping and ongoing consultation, including consideration of responses and how these should be addressed as part of the EIA;
- Technical environmental impact assessments; and

- Preparation and submission of the EIA Report.

11. The EIA Report

11.1.1. An EIA Report has been prepared to identify and report upon the potential for significant environmental effects occurring as a consequence of constructing, operating and decommissioning the Proposed Varied Development. Measures are identified that can be put in place to avoid, reduce or mitigate those effects.

11.1.2. Following the introductory chapters **(Chapters 1 – 6)**, the following environmental topics are assessed in the EIA Report:

- Forestry;
- Landscape and Visual;
- Ecology;
- Ornithology;
- Cultural Heritage;
- Geology and Peat;
- Hydrology and Hydrogeology;
- Noise and Vibration;
- Traffic and Transport;
- Aviation;
- Shadow Flicker; and
- Climate Change and Carbon Balance.

11.1.3. As the Proposed Varied Development is a variation to the Consented Shepherds' Rig Wind Farm, a comparison of the environmental effects between the Consented Development and the Proposed Varied Development has been undertaken and is set out in each technical chapter of the EIA Report (**Chapters 7 – 18**).

11.1.4. A summary of the baseline conditions, the proposed mitigation and the resulting residual effects for each environmental topic assessed is provided in the following section of this NTS. Full details can be found within **Volume 1, Chapters 7 - 18** of the EIA Report.

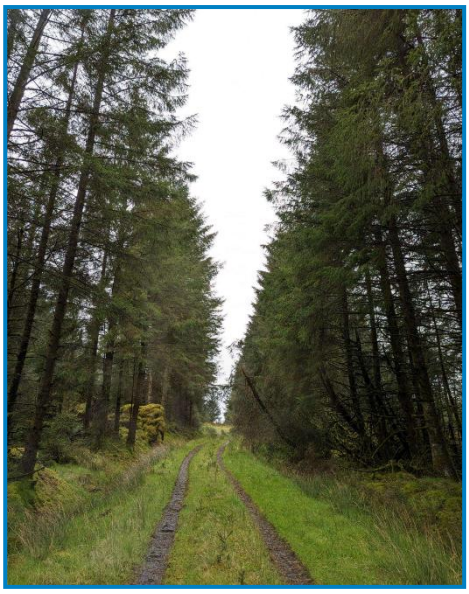
12. Summary of Environmental Effects

12.1. Forestry

12.1.1. The full assessment of the effects on forestry is provided in Volume 1, **Chapter 7** of the Proposed Varied Development's EIA Report.

12.1.2. The Proposed Varied Development is largely located within commercial forestry. The forestry assessment has identified that areas of forestry would require to be felled for the construction and operation of the Proposed Varied Development.

12.1.3. Forestry has not been regarded as a receptor for EIA purposes. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as storm damage, pests or diseases; and external factors, such as a wind farm or other developments. The forestry proposals are interrelated with environmental effects, which are assessed separately in other chapters of the EIA Report.



12.1.4. The Forestry Study Area (FSA) extends to approximately 820.9 hectares (ha) and is comprised of a woodland which is privately owned and managed. The forest comprises largely commercial conifers with areas of mixed broadleaves planted in the late 1900s and open ground. The crops are in the mid restructuring phase and there have been recent felling and replanting programmes.

12.1.5. A total of 226.1 ha will require to be felled to enable the construction and operation of the Proposed Varied Development, including 66.6 ha for forest-to-bog restoration. The majority of the areas to be felled for the Proposed Varied Development would be restocked except for land required for the Proposed Varied Development's permanent infrastructure and land to be left unplanted for forest management or habitat enhancement measures.

12.1.6. The Applicant is committed to providing appropriate compensatory planting, the extent of which remains effectively unchanged from the Consented Development. The final extent, location and composition of such planting will be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of construction of the Proposed Varied Development.

12.2. Landscape and Visual

12.2.1. The full assessment of the effects on landscape and visual receptors is provided in Volume 1, **Chapter 8** of the Proposed Varied Development's EIA Report.

12.2.2. The site is not located within any national landscape designations such as a National Scenic Area or National Park, although a small part of the development, including three of the north-western turbines, lies within the locally designated Galloway Hills Regional Scenic Area.

12.2.3. The layout of the Proposed Varied Development has been developed through an iterative design process to minimise landscape and visual effects, while also meeting technical and commercial requirements. This approach is consistent with the design evolution of the Consented Development. Appropriate separation distances from nearby properties and settlements have been retained to ensure that no properties would experience an overbearing visual impact under either scheme. In addition, mitigation is proposed for aviation lighting on the turbines, allowing light intensity to be reduced in certain conditions to limit night-time visibility.

12.2.4. As with the Consented Development, the assessment identifies that the Proposed Varied Development would result in some localised significant effects on landscape character and visual amenity, particularly within the immediate surroundings. During daylight hours, significant effects would occur within parts of the Southern Uplands with Forest Landscape Assessment Unit (AU) and in localised parts of four adjacent AU areas. This is the same as the Consented Development.

12.2.5. In terms of visual effects, the Proposed Varied Development would result in significant effects from a slightly increased number of viewpoints compared to the Consented Development (16 of the 22 viewpoints as opposed to 15), as well as from a greater number of nearby residential properties during daylight hours (seven properties in comparison to two), particularly within 2 km of the site. There would also be some additional significant effects on sections of walking routes, including from sections of ten core paths / rights of way, including parts of the Southern Upland Way (an increase of three sections from the Consented Development), from parts of the National Byway Cycle Route, and localised parts of the Galloway Hills RSA. Effects from the local road network would remain unchanged compared to the Consented Development, with significant visual effects predicted during daylight hours for sections of the A713, B729, B7000 and Lorg Road.

12.2.6. During the hours of darkness, the Proposed Varied Development would introduce new visual effects due to the inclusion of aviation lighting, which was not required for the Consented Development. During the hours of darkness there would be significant effects on five of the 22 viewpoints; from sections of six core paths / rights of way, including parts of the Southern Upland Way; and from Lorg Road. These night-time effects would be experienced from a limited number of viewpoints, routes, and locations, and mitigation measures would reduce their intensity where possible.

12.2.7. When considered alongside other operational and proposed wind farms in the area, both the Consented Development and the Proposed Varied Development contribute to a landscape where wind energy development is an increasingly noticeable feature. While the Proposed Varied Development would reinforce this pattern, the assessment concludes that significant cumulative effects would occur regardless of whether the variation is implemented.

12.2.8. Although some localised significant effects on landscape character and visual amenity within the Galloway Hills RSA have been identified, the assessment finds that, as with the Consented Development, the overall special qualities and reasons for designation of the area would not be significantly affected.

12.2.9. Overall, while the Proposed Varied Development would result in some increased visual effects compared to the Consented Development, particularly for nearby receptors and at night, the nature and extent of landscape effects remain broadly similar. The assessment concludes that the landscape has the capacity to accommodate the Proposed Varied Development.

12.3. Ecology

12.3.1. The full assessment of the effects on ecology is provided on **Volume 1, Chapter 9** of the Proposed Varied Development's EIA Report.

12.3.2. The scope of the assessment and baseline conditions were determined through a combination of desk studies and targeted studies, undertaken in 2018 for the Consented Development and updated in 2024 for the Proposed Varied Development. The studies undertaken include baseline ecology surveys (Phase 1 surveys and National Vegetation Classification surveys), and protected species surveys. Protected species surveys undertaken were for otter, water vole, red squirrel, pine marten and bats. Surveys were undertaken following recognised national guidance.

12.3.3. There are no ecologically designated sites within or near to the site. The nearest designated site is Cleugh Site of Special Scientific Interest (SSSI), located approximately 4 km south.

12.3.4. The protected species surveys confirm that the Proposed Varied Development site supports a limited assemblage of species typical of managed forestry landscapes. Otter is present within the wider area, with activity confined to commuting and foraging along watercourses and no holts or couches identified within the site. Bat activity is generally low, dominated by common species, with limited evidence of roosting and use of the site primarily for commuting and foraging along woodland edges and linear features. Evidence of badger and pine marten indicates opportunistic use of the site for foraging and movement, although no setts or dens have been recorded. Red squirrel is considered absent or present at very low levels, and water vole is considered unlikely to be present. Reptiles and amphibians may occur locally in suitable habitats. Overall, the site is not considered to support significant breeding or resting

resources for protected species, and its value is limited to local-scale use for foraging and commuting.

12.3.5. The habitat on site comprises coniferous woodland plantation, dominated by non-native commercial tree species of low ecological value and generally low biodiversity. Remnant degraded modified bog underlies much of this woodland, however all on-site bog is significantly degraded and not currently active. This habitat has historically been extensively felled and replanted and is not considered to be of national interest.

12.3.6. The Proposed Varied Development has been designed to minimise impacts ecological receptors far as practicable. Embedded mitigation, good practice measures, and pre-construction checks, as directed by a suitably qualified Ecological Clerk of Works, will ensure the protection of protected species and oversee construction works to minimise any potential effects on nature conservation interests. A site-specific CEMP will also be developed and implemented ahead of any construction works commencing.

12.3.7. Bats and otter were taken forward for further detailed assessment. With the appropriate mitigation in place, the assessment concludes that the Proposed Varied Development would not result in significant effects on these protected species populations, consistent with the findings of the Consented Development.

12.3.8. Cumulative effects were considered in relation to bats. Given the low levels of bat activity in the local area and lack of significant effects and/or residual impacts from the developments and planning applications considered, no significant cumulative effects are anticipated.

12.3.9. The Proposed Varied Development proposes to remove targeted areas (consisting of deep peat with restoration potential totalling approximately 66.75 ha) from commercial forestry operations and manage these areas for the restoration of historic blanket bog and bog woodland (refer to the outline HEMP included as **Appendix 9.8** in Volume 4 of the EIA Report). Drier areas around turbine bases and along access tracks will be removed from commercial operations and used to create dry heathland and acid grassland. Areas that are not viable for commercial forestry will be planted with broadleaved woodland which will enhance the riparian corridors on-site.

12.3.10. In line with the findings for the Consented Development, the assessment concludes that there are no potential significant effects on any receptors during the construction, operation and decommissioning of the Proposed Varied Development.

12.4. Ornithology

12.4.1. The full assessment of the effects on ornithology is provided in **Volume 1, Chapter 10** of the Proposed Varied Development's EIA Report.

12.4.2. This chapter considers the potential for likely significant effects on ornithology resulting from the Proposed Varied Development. It also considers the potential for changes to ornithology effects resulting from an increase in turbine tip height from (predominantly)

150 m for the Consented Development to 220 m for the Proposed Varied Development, and the consequent alteration to the turbine layout and number.

12.4.3. The scope of the assessment and baseline ornithological conditions were determined through survey results undertaken for the Consented Development and recent surveys from between April 2023 and March 2024 for the Proposed Varied Development. These updated surveys involved breeding and non-breeding season Vantage Point surveys.

12.4.4. The site is not located within or adjacent to any statutory sites designated for ornithological interest, and there are no such sites within 10 km of the site. There is one statutory designated site for ornithological interest within 20 km of the site (Loch Ken and River Dee Marches Special Protection Area (SPA), situated approximately 13 km to the south).

12.4.5. Recordings of wildfowl were very low during the 2023-2024 flight surveys, with a single flight by whooper swan totalling 17 birds (the only species of conservation concern recorded), three flights by pink-footed goose and seven flights of greylag geese. Raptor surveys recorded goshawk (9 flights), red kite (45 flights), hen harrier (5 flights) and merlin (one flight). Volume 4, **Appendix 10.1** details bird flight observations in detail.

12.4.6. Four species were taken forward for assessment: goshawk, red kite, hen harrier and osprey. Collision risk modelling predicted a very low collision risk rate for all species (less than 0.1 estimated collisions per year per species). Although this is an increase from the Consented Development, the low numbers represent no material difference to collision risk.

12.4.7. With standard and embedded mitigation measures in place, all predicted effects are considered to be minor adverse or negligible and therefore not significant. This remains unchanged from the Consented Development.

12.4.8. The Applicant has committed to additional mitigation and enhancement measures to further reduce adverse effects and introduce improvements A Breeding Bird Protection Plan (BBPP), will be submitted to Dumfries and Galloway Council prior to the start of construction to ensure that the impact of construction on birds is minimised. Habitat enhancement and management measures, as described in Volume 4, **Appendix 9.8** of the EIA Report, will have direct and tangible benefits for ornithological features, including black grouse population.

12.5. Cultural Heritage

12.5.1. The full assessment of the effects on cultural heritage is provided in **Volume 1, Chapter 11** of the Proposed Varied Development's EIA Report.

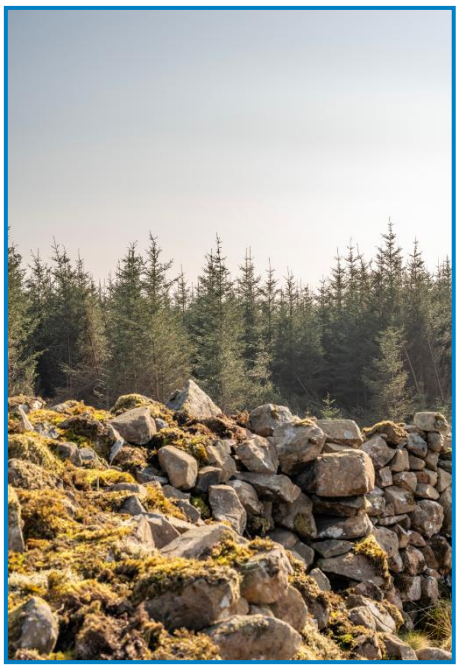
12.5.2. The assessment identifies the archaeological and cultural heritage value of site and assesses the likely significant effects on archaeological features and heritage assets resulting from the construction, operation and decommissioning of the Proposed Varied Development.

12.5.3. There are 26 known heritage assets within the site, one of which is designated (Scheduled Monument 2238 Craigengillan Cairn). Of the remaining non-designated 25 heritage assets (assets that are not given legal protection), 15 have been destroyed by forest activity. The level of archaeological potential within the site is considered to be low.

12.5.4. All known non-designated heritage assets within the site boundary have been avoided by the Proposed Varied Development infrastructure by design, other than one non-designated heritage asset (boundary wall HA1), discrete parts of which would be subject to a direct but non-significant physical impact during the construction phase.

12.5.5. The setting of two Scheduled Monuments and one non-designated heritage asset of National importance within the wider study area have been assessed for operational impacts resulting from the Proposed Varied Development. These assets are noted below and were determined based on an asset's proximity to the Proposed Varied Development, appraisal of the blade-tip Zone of Theoretical Visibility, and the scoping response provided by Historic Environment Scotland:

- Craigengillan Cairn (SM2238);
- Stroanfreggan Craig Fort (SM1095); and
- Non-designated heritage asset of National Importance MDG11404 Little Auchrae farmstead.



12.5.6. Conclusions relating to operational setting effects are the same for the Proposed Varied Development as for the Consented Development. Whilst the proposed turbines would be taller, they are fewer, and the gaps between them are wider, which has the effect of preserving more openness in views through the Proposed Varied Development, leading to a reduced overall visual clutter compared to the Consented Development. Whilst adverse impacts upon the cultural significance of heritage assets within and surrounding the site are assessed to remain, the impact is of no increased magnitude in comparison with the Consented Development. No cumulative impacts have been identified.

12.5.7. The layout of the Proposed Varied Development, including the positioning, size, and number of turbines, and the siting of other associated infrastructure, has been designed to avoid or minimise both construction and operational effects on heritage assets. In advance of, during, and after construction a programme of archaeological monitoring, fieldwork, recording, and reporting is likely to be required, to be agreed through a Written Scheme of Investigation (WSI). Mitigation will include preservation by record, protection by fencing and, any micrositing being reviewed to avoid impacts on known heritage assets.

12.5.8. The Cultural Heritage chapter of the EIA Report concludes that there are no significant effects on heritage and archaeological assets, either alone or cumulatively, during construction, operation or decommissioning of the Proposed Varied Development.

12.6. Geology and Peat

12.6.1. The full assessment of the effects on geology and peat is provided in **Volume 1, Chapter 12** of the Proposed Varied Development's EIA Report.

12.6.2. The geology and peat assessment for the Proposed Varied Development was based on a desk study, site surveys, and consultation with the Scottish Environment Protection Agency (SEPA) to identify and characterise the geological receptors which could be subject to impacts from construction, operation and decommissioning of the Proposed Varied Development.

12.6.3. The design of the Proposed Varied Development has been informed by detailed programme of peat depth probing as required by relevant guidance. The assessment of carbon rich soils and peat has considered all the proposed infrastructure, including new and existing access tracks scheduled to be upgraded as part of the Proposed Varied Development. Peat is generally absent on over large areas of the site, and where it is present it is generally shallow, covered by commercial forestry and is heavily drained as part of the forestry plantations

12.6.4. It has been shown that areas of deep peat (areas >1 m deep) have been largely avoided by the Proposed Varied Development. Where feasible, and considering other constraints, floating tracks are proposed where tracks are located on peat >0.5 m depth to reduce peat excavation.

12.6.5. Most notably from a geology and peat perspective, the Proposed Varied Development reduces the number of turbines from 17 to 11 compared to the Consented Development's design whilst increasing the remaining turbine's size. Several turbines on the western side of the site have been re-sited and re-oriented onto shallower peat. The reduction in the number of turbines and length of access tracks means that there is less disturbance of peat than that of the previous Consented Development. The volume of excavated peat required is now estimated at 80,074 m^3, which is 13,613 m^3 less than that of the Consented Development. Even when adopting a highly conservative comparison between the total potential peat excavation for the Proposed Varied Development and the infrastructure-only excavation volume reported for the Consented Development, peat excavation is still reduced by at least 5,606 m^3.

12.6.6. During construction, operation and decommissioning of the Proposed Varied Development, a number of established good practice measures will be put in place to minimise peat disturbance, peat stability, and loss and compaction of soils. As part of the construction of the Proposed Varied Development, approximately 66.75 ha of forest to bog restoration will be undertaken, as part of the Proposed Varied Development's HEMP (Volume 4, **Appendix 9.8** of the EIA Report).

12.6.7. With effective and well managed mitigation measures in place, no significant residual effects on geology and peat are predicted as a result of the Proposed Varied Development.

12.6.8. The proposed variations to the Consented Development will result in no change to the significance of effects on the geology and peat environment overall, including cumulative effects which is assessed as not significant.

12.7. Hydrology and Hydrogeology

12.7.1. The full assessment of the effects on hydrology and hydrogeology is provided in Volume 1**, Chapter 13** of the Proposed Varied Development's EIA Report.

12.7.2. The hydrological and hydrogeological assessment for the Proposed Varied Development was based on a desk study, site surveys, and consultation with DGC, Marine Scotland, Scottish Water and SEPA to identify and characterise the hydrological and hydrogeological receptors which could be subject to impacts from construction, operation and decommissioning of the Proposed Varied Development.

12.7.3. The site lies entirely within the Water of Ken catchment, with most of the site draining eastwards via a network of small streams into the upper Water of Ken catchment. The site contains a number of small burns, including Poliferie Burn, Craigengillan Burn, Black Burn, Dry Burn and tributaries of the Marbrack Burn. These are typical upland watercourses, generally narrow, shallow and fast-flowing in places. The drainage pattern is typical of upland areas, with many small channels joining together as water flows downstream into larger rivers.

12.7.4. There are no statutory designated sites within the study area that are hydrologically connected to the Proposed Varied Development. There are no Groundwater Dependent Terrestrial Ecosystems (GWDTEs) that are hydrologically or hydrogeologically connected to the Proposed Varied Development infrastructure.

12.7.5. Potential construction and operational effects include changes to surface water quality and flow and impacts on Private Water Supplies (PWS). A PWS risk assessment was undertaken of local private supplies which found there to be no significant effects at all properties assessed.

12.7.6. None of the Proposed Varied Development's infrastructure has been assessed as being at risk from river flooding and the turbine locations avoid potential surface water flooding areas.

12.7.7. Proposed mitigation measures to avoid or reduce potential impacts, include developing and implementing a CEMP and a programme of water quality monitoring prior to the commencement of construction activities, as well as a HEMP which will enhance riparian corridors through additional bankside planting.

12.7.8. The proposed variations to the Consented Development will result in no change to the significance of effects on the water environment overall, including cumulative effects.

Effects on the water environment associated with the Proposed Varied Development are considered to be not significant. This represents no change to the conclusions for the Consented Development.

12.8. Noise

12.8.1. The full assessment of the effects of noise is provided in Volume 1, **Chapter 14** of the Proposed Varied Development's EIA Report. The assessment compares the Proposed Varied Development with the Consented Development, taking into account the key changes, including a reduction in turbine numbers, updated turbine models and layout, changes to access tracks, and an increase in battery storage capacity.

12.8.2. Noise from construction and decommissioning activities would be temporary and was previously assessed for the Consented Development as not giving rise to significant effects. The same conclusion applies to the Proposed Varied Development, with standard good practice measures, such as limiting working hours and managing construction activities, used to minimise disturbance. A CEMP will also be produced detailing methods by which construction noise will be controlled.

12.8.3. Operational noise from the turbines has been assessed using established guidance and best practice methods for wind farms. The assessment also considers noise from nearby wind farms, including both operational and proposed developments, to understand any cumulative effects. The results show that predicted noise levels from the Proposed Varied Development would remain within accepted limits at all nearby residential properties and would be similar to those predicted for the Consented Development.

12.8.4. Noise associated with the BESS and substation has also been assessed. Predicted noise levels from this equipment would be well below existing background noise levels, meaning that effects would be negligible.

12.8.5. The layout and design of the Proposed Varied Development have been refined to minimise noise effects as far as possible. Overall, the assessment concludes that there would be no significant noise effects, either during construction or operation, and no meaningful change compared to the Consented Development.

12.9. Traffic and Transport

12.9.1. The full assessment of the effects on traffic and transport is provided in **Volume 1, Chapter 15** of the Proposed Varied Development's EIA Report.

12.9.2. The Proposed Varied Development has the potential to affect the surrounding local road network during its construction and operation from traffic travelling to and from the site delivering materials and plant. Due to the nature of the operation of the Proposed Varied Development, the majority of vehicular activity is during the construction phase with minimal traffic during the operational phase.

12.9.3. Construction traffic would peak around month nine of the construction programme. At this time, daily traffic movements are estimated to be up to approximately 270 vehicle

movements per day. However, this represents a worst-case scenario where 100% of stone requirements are imported. In practice, stone is likely to be sourced from on-site borrow pits, which would reduce traffic to around 110 vehicle movements per day.

12.9.4. When compared to the Consented Development using the same assessment methodology, the Proposed Varied Development would lead to a small increase in traffic during the peak construction period, equivalent to around 25 additional vehicle movements per day. This increase is not considered significant.

12.9.5. Assessment of the local road network shows that there is sufficient capacity to accommodate construction traffic. Even when considering the possibility of other nearby developments being built at the same time, there would still be adequate road capacity. Any potential cumulative effects would be managed through a coordinated Traffic Management and Monitoring Plan agreed with Dumfries and Galloway Council.

12.9.6. The Applicant will also prepare Construction Traffic Management Plan (CTMP) which would describe measures to manage traffic to and from the Proposed Varied Development. The CTMP will set out proposed details for staff travel, heavy goods vehicle routing and guidelines for deliveries to further reduce potential effects on the surrounding network during the construction period.

12.9.7. Overall, the assessment concludes that following the implementation of comprehensive mitigation measures, traffic and transport effects would be limited to the construction phase, would be temporary and reversible, and would not result in any significant long-term impacts on the road network.

12.10. Aviation and Radar

12.10.1. The full assessment of the effects on aviation and radar is provided in Volume 1, **Chapter 16** of the Proposed Varied Development's EIA Report.

12.10.2. The Proposed Varied Development is remote from any significant aviation facilities (40 miles south-east of Glasgow Prestwick Airport and over 70 km from Glasgow Airport and Edinburgh Airport). Radar modelling shows that there is no possibility of the turbines in the Proposed Varied Development being visible to the radar at any of the three airports.

12.10.3. The only aviation issues relevant to the Proposed Varied Development are the potential for effects on the NATS En Route (NERL) Lowther Hill and Great Dun Fell radars and on Ministry of Defence (MoD) low flying activities.

12.10.4. As the turbines for the Proposed Varied Development are taller than for the Consented Development, an aviation lighting mitigation scheme has now been agreed with the MoD. This includes for a reduced lighting scheme with both infra-red and visible red lights. Volume 4, **Appendix 16.1** of the EIA Report details the aviation lighting mitigation scheme.

12.10.5. There are no technical effects on aviation interests during construction or decommissioning. Aviation issues during construction and decommissioning are those

associated with the operation of large cranes, which will be subject to standard conditions for crane operations.

12.10.6. During operation, moving turbine blades have the potential to impact the performance of the NATS Lowther Hill and Great Dun Fell radars, which will be mitigated through technical capabilities built into the radar specifically to enable wind turbine effects to be overcome.

12.10.7. The likely effects of the Proposed Varied Development on aviation operations are very limited. From a military perspective the only minor effect is on military low flying, which is mitigated through the installation of infrared lights and medium intensity aviation obstruction lighting. With the exception of the requirement for aviation lighting, this presents no change to the assessment findings for the Consented Development, with no significant effects predicated.

12.11. Shadow Flicker

12.11.1. The full assessment of the effects on shadow flicker receptors is provided in Volume 1, **Chapter 17** of the Proposed Varied Development's EIA Report. This should be read in conjunction with the description of the Proposed Varied Development in **Chapter 4**.

12.11.2. Shadow flicker may occur under certain circumstances of geographical position and time of day, when the sun passes behind the rotors of a wind turbine and casts a shadow over neighbouring properties. As the blades rotate, the shadow flicks on and off which is an effect known as shadow flicker. The effect occurs inside buildings, where the flicker appears through a window opening.

12.11.3. The area within which properties could be affected by shadow flicker has been set at a distance of 10 rotor diameters from each turbine and 130 degrees either side of north (relative to each turbine). In this assessment, the Study Area extends to 1.63 km from each turbine. Volume 2, **Figure 17.1** of the EIA Repot illustrates the extent of this area and the properties that could potentially affected by shadow flicker.

12.11.4. The consented Development's shadow flicker assessment considered two receptors within the assessment study area. The larger turbine rotor diameters for the Proposed Varied Development mean a larger shadow flicker study area, with a further four receptors identified and assessed.

12.11.5. The Applicant will implement a Wind Farm Shadow Flicker Protocol for the operational lifetime of the Proposed Varied Development. This will set out measures to alleviate shadow flicker and a protocol to address a complaint received from a property in the Study Area. Mitigation measures could include the provision of local screening, and selective automatic turbine shutdown during times of year when shadow flicker is predicted.

12.11.6. This assessment concludes that with mitigation, all operational shadow flicker effects are assessed as not significant. No shadow flicker will occur during the construction and decommissioning stages of the Proposed Varied Development.

12.11.7. There are no properties within the overlap of shadow flicker study areas for the Proposed Varied Development and other proposed, consented or built wind farms in the surrounding area. Therefore, there is no potential for cumulative shadow flicker effects. These conclusions remain unchanged from the Consented Development.

12.12. Climate Change and Carbon Balance

12.12.1. The full assessment of the effects on climate change and carbon balance is provided in Volume 1, **Chapter 18** of the Proposed Varied Development's EIA Report.

12.12.2. This assessment uses the Scottish Government's Carbon Calculator for wind farms on peat to assess the benefit of displacing electricity from fossil fuels with renewable generated electricity, compared to the emissions of carbon required for the construction and operation of the Proposed Varied Development over its 40 year lifetime, including losses of stored carbon from disturbed peatland and reduction of forest cover. The Carbon Calculator provides an estimate of the carbon payback time for the Proposed Varied Development.

12.12.3. The estimated payback time (the period of wind farm operation required until there is a net saving of CO_2) of the Proposed Varied Development is 1.5 years based on a fossil fuel mix of electricity generation. The Proposed Varied Development is estimated to save 113,017 tonnes of CO_2e per year, through the displacement of grid electricity, based on the current fossil fuel grid mix. This equates to over 4.5 million tonnes of CO_2e over the Proposed Varied Development's 40-year operational lifetime. In comparison, the Consented Development is expected to save 2,153,160 tonnes of CO_2e over its 30-year operational lifetime.

12.12.4. The Proposed Varied Development will have a positive effect on carbon savings both in isolation and cumulatively when considered with UK-wide renewable energy deployment. As with the Consented Development, no significant climate change effects are anticipated.

13. Benefits of the Proposed Varied Development

13.1.1. The addition of the Proposed Varied Development will deliver the following key benefits to local communities, Dumfries and Galloway and to Scotland:

- The Proposed Varied Development would contribute to the attainment of the UK and Scottish Government policies of encouraging renewable energy developments; and in turn contribute to the achievement of UK and Scottish Government targets for both renewable electricity generation and electricity storage. The Proposed Development, with an overall capacity of approximately 127 MW, would make a valuable contribution to meeting such targets.
- The Proposed Development would have a total capacity of approximately 127 MW, generated by eleven 7 MW turbines (77 MW), and energy storage facilities (50 MW). The wind element would produce around 241,340 megawatt hours (MWh)/year of clean power which would generate enough electricity to supply approximately

76,860 average Scottish households. Furthermore, the BESS would in addition provide short duration electricity storage to support the National Grid, further contributing to national targets in terms of energy storage requirements to support the country's transition to a clean power grid.

- The Proposed Varied Development is expected to save up to 113,017 tonnes of carbon dioxide per year, resulting in a total saving of over 4.5 million tonnes over its operational lifetime through displacing carbon-emitting generation.
- Based on an installed capacity of 77 MW, the Proposed Varied Development will deliver up to £385,000 per annum in Community Benefit Funding or up to £15.4 million in total over its 40 year operational life.
- Total construction spend on the Proposed Varied Development is estimated to generate £37.5 million Gross Value Added (GVA) in Scotland. In addition, the operational spend is estimated to generate a further £2.9 million GVA in Scotland every year over its 40-year lifetime. The Proposed Varied Development will also support the delivery of local services through the annual payment of at least £1.6 million in non-domestic rates, anticipated to accumulate to around £65.1 million across its 40-year operational lifespan.
- The Proposed Varied Development will support local economic activity: To maximise the local benefits of contracts associated with the Proposed Varied Development, the Applicant has committed to raising awareness of upcoming contracts to allow sufficient time for local suppliers to prepare and compete in the tendering process, creating a register of local contractors, and actively encouraging Tier 1 suppliers to use and hire local businesses in alignment with the Applicant's 'Responsible Procurement Charter'.
- A comprehensive suite of habitat enhancement and management proposals including 66.75 hectares of forest to bog restoration are being put forward within the HEMP to which will mitigate adverse effects as a result of the Proposed Varied Development and also provide biodiversity enhancement to local receptors.
- To support skills development, the Applicant has committed to providing three scholarships of £3,000 per year for students from households within Dumfries and Galloway to support Science Technology Engineering and Mathematics ('STEM') subjects and construction skills.

13.1.2. All of the benefits listed above are greater than those associated with the Consented Development.

14. Conclusion

14.1.1. This Non-Technical Summary of the EIA Report provides an overview of the EIA undertaken for the Proposed Varied Development.

14.1.2. The Applicant has calculated that the energy yield of the Consented Development can be increased by approximately 53% by reducing the number and increasing the height of the proposed turbines. These primary factors have encouraged the Applicant to undertake a variation to the Consented Development, as outlined in the EIA Report. This increase in turbine height, together with the reduction in turbine numbers, would only result in limited changes to environmental effects.

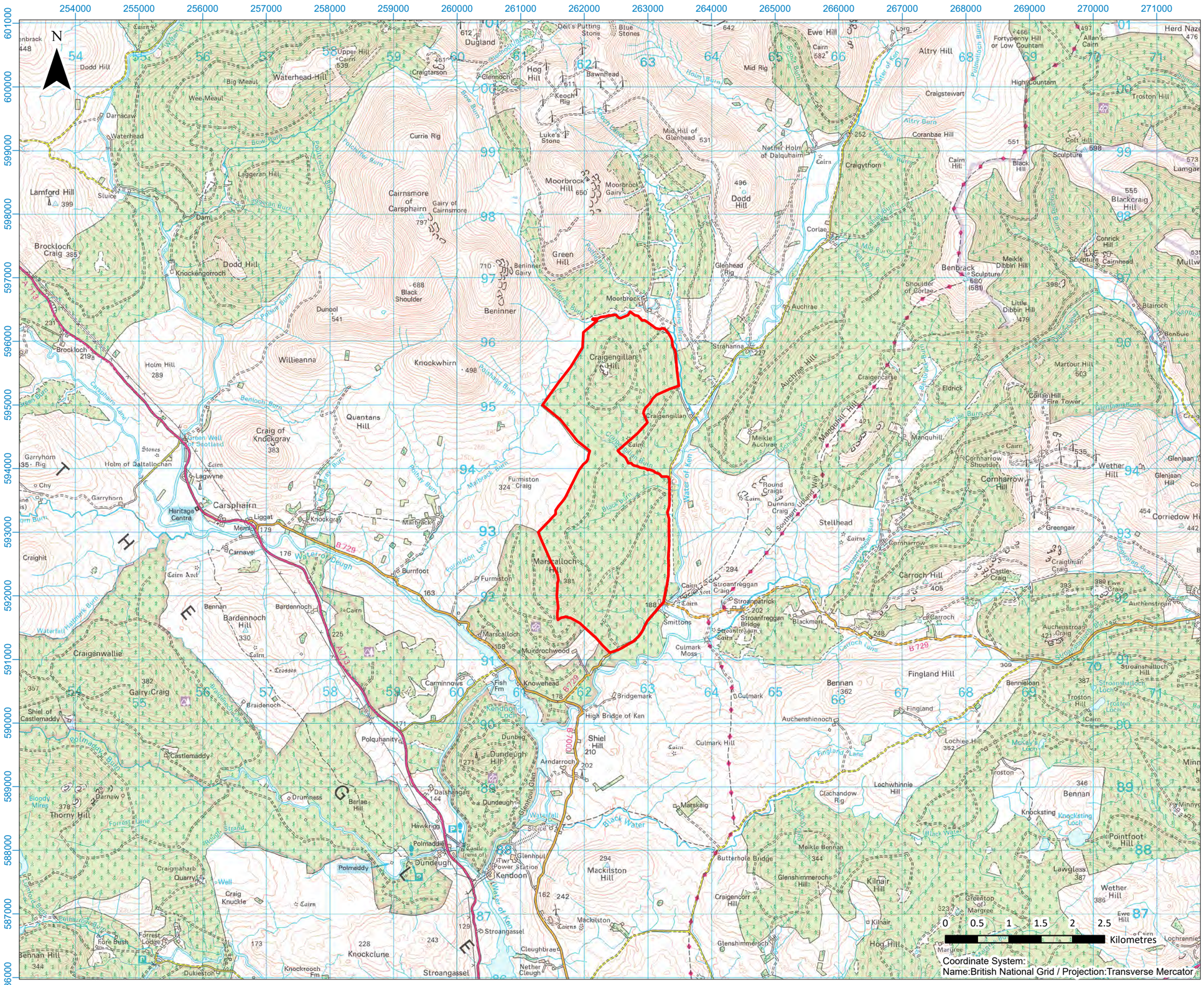
14.1.3. Volume 1, **Chapters 19 and 20** of the EIA Report summarise the potential effects, the mitigation to be implemented and the resulting residual effects. **Chapter 20** also provides a summary of the cumulative effects of the Proposed Varied Development in combination with other proposed, consented and operational developments in the local area.

14.1.4. The final layout has been informed by a robust EIA and lengthy design iteration process, considering potential environmental impacts and their effects, physical constraints, and health and safety considerations. The information used to inform the design iteration process included consultation responses received, baseline data and the impact assessment undertaken.

14.1.5. Consideration has been given to a range of design issues as well as various environmental, ecological and technical requirements. Predicted environmental effects arising from the Proposed Varied Development have been mitigated as far as possible, if not eliminated during the iterative design process.

14.1.6. Overall, the Proposed Varied Development is an appropriately designed and sensibly located renewable development which is in line with policies in the local and strategic development plans and conforms to national policy. The Proposed Varied Development has been designed to maximise energy production from an existing wind farm landscape, within acceptable environmental limits. The Proposed Varied Development will provide a valuable contribution towards the ambitious national targets for electricity generation from renewable sources, provides substantial biodiversity enhancements and contributes towards sustainable economic growth locally and throughout Scotland as a whole.

Figure 1: Site Location



Legend:

Site Boundary

Title

Site Location

Project:

Shepherds' Rig Wind Farm Section 36C

Source:

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Client:

Boralex

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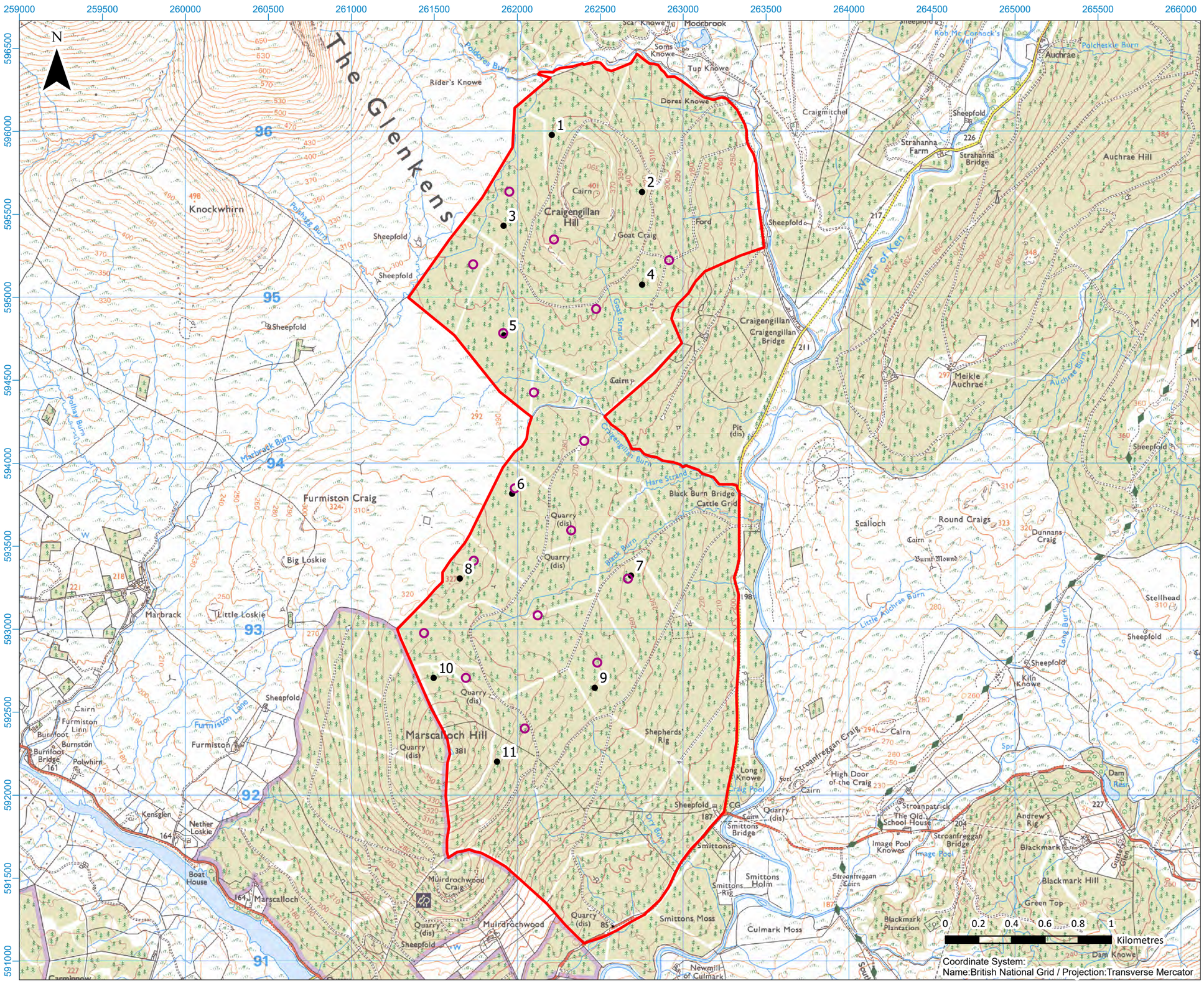
AR	CK
Date:	**Figure:**
08/04/2026	1
Scale:	**Revision No.**
1:60,000	1

Figure 2: Varied and Consented Turbine Locations

BORALEX



Legend:

- Site Boundary
- Proposed Varied Development Turbine Location
- Consented Development Turbine Location

Title

Varied and Consented Turbine Locations

Project:

Shepherds' Rig Wind Farm Section 36C

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Client:

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14/04/2026	2
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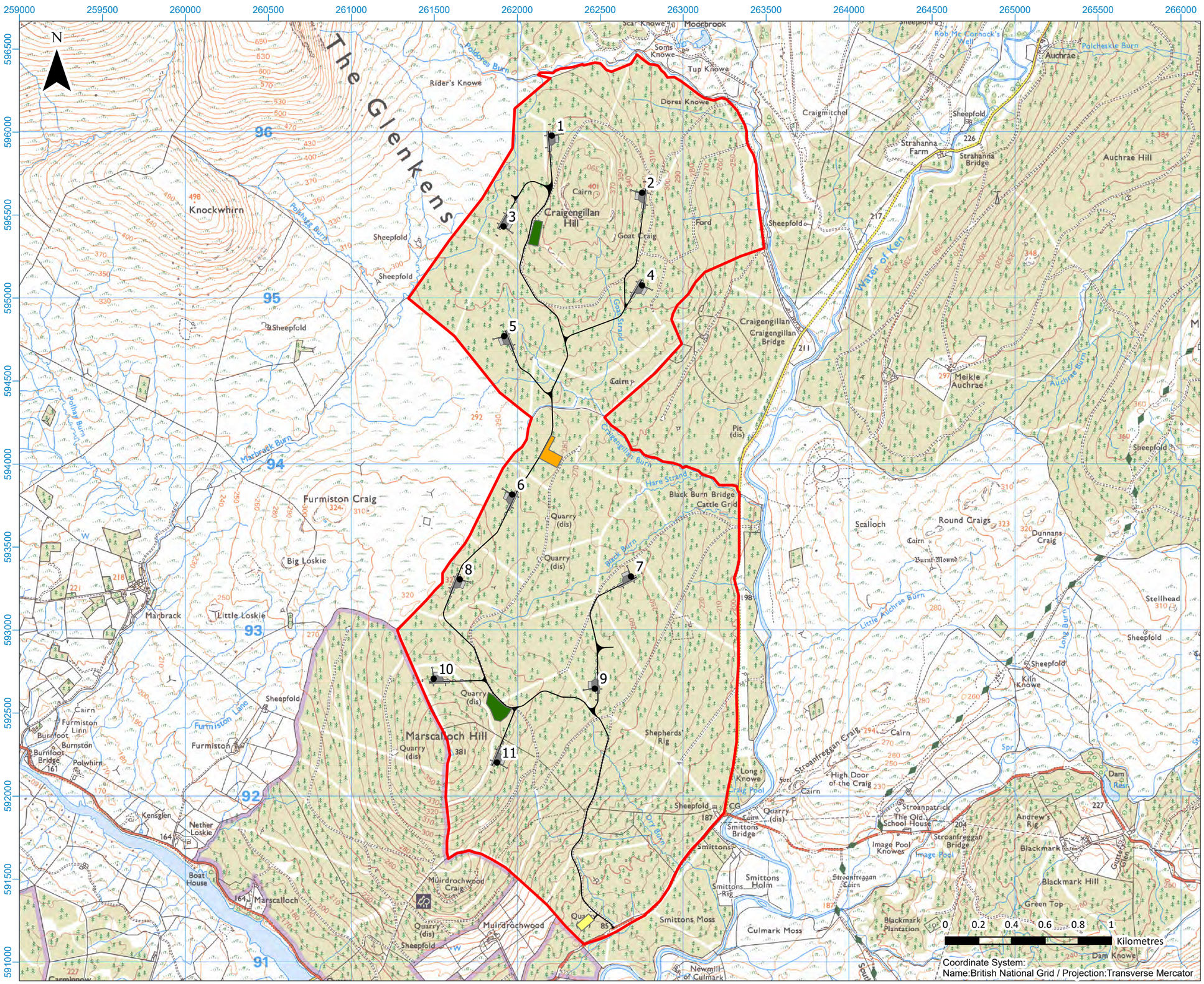
Figure 3: Proposed Varied Development Layout

BORALEX



Legend:

- Site Boundary
- Turbine Location
- Access Track
- Hardstanding (Permanent)
- Hardstanding (Temporary)
- Substation and BESS Compound
- Construction Compound
- Borrow Pit

Title

Proposed Varied Development Layout

Project:

Shepherds' Rig Wind Farm Section 36C

Source:

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Client:

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