



EIA Report Addendum

Drumduff Extension Wind Farm

Volume 1: Further Environmental Information

Drumduff Extension Limited

October 2023



Contents

1	Introduction	1
1.1	The Applicant	1
1.2	The Project Team	1
1.3	Purpose of this Addendum Report	2
1.4	Structure of Report	2
1.5	Contact Details	3
2	Updated Development Description	4
2.1	Introduction	4
2.2	Reduced T3 turbine height	4
2.3	Amendments to track layout	4
3	Supplementary Information	6
3.1	Introduction	6
3.2	Statutory Consultation	6
3.3	Hydrological connectivity potential – Blawhorn Moss SAC catchment	14
4	Cumulative Assessment	16
4.1	Introduction	16
4.1.1	Assessment Methodology	16
4.1.2	Cumulative Assessment	16
4.1.3	Assumptions and Limitations	16
4.2	Landscape and Visual	16
4.2.1	Introduction	16
4.2.2	Reading Guide	17
4.2.3	Methodology	17
4.2.4	Supporting Graphics	17
4.2.5	Updated Assessment of Residual Effects	18
4.2.6	Summary	28
4.2.7	References	29
4.3	Cultural Heritage	29
4.3.1	Introduction	29
4.3.2	Methodology	29
4.3.3	Supporting Graphics	30
4.3.4	Updated Assessment of Effects	30

Contents

4.3.5 Updated Cumulative Assessment	31
4.3.6 Summary	32
4.3.7 References	32
4.4 Noise	33
4.4.1 Background	33
4.4.2 Introduction	33
4.5 Methodology and Approach	33
4.5.1 Legislation, planning policy and guidance	33
4.5.2 Assessment Methodology	34
4.5.3 Significance Criteria	37
4.5.4 Baseline Conditions	37
4.5.5 Assessment of Effects and Mitigation	37
4.6 Residual Effects and Conclusions	45
4.7 Summary and Statement of Significance	45
5 Conclusions	46
Appendices	49
Appendix A. Updated Site Layout	49
Appendix B. Supplementary Environmental Information: Ecology and Ornithology	50
Appendix C. Updated Carbon Calculator inputs and key findings	51

Contents

Tables

Table 1:	FEI Project Team	1
Table 2:	Summary of Consultee Responses	6
Table 3:	Summary of Predicted Significant Landscape Effects of the Proposed Development	18
Table 4:	Summary of Predicted Significant Visual Effects of the Proposed Development	20
Table 5:	Summary of Predicted Significant Landscape Effects of the Proposed Development	21
Table 6:	Operational Effects on Viewpoint 15, Harthill Road, Blackridge	27
Table 7:	Construction Noise Assumptions	38
Table 8:	Turbine Sound Power Levels	39
Table 9:	Turbine Octave Sound Power Levels (dB LWAEq)	39
Table 10:	Noise Prediction Results – Proposed Development Alone	39
Table 11:	Noise Prediction Results – Proposed Development plus Drumduff Existing	39
Table 12:	Noise Prediction Results – Drumduff Existing and Burnhead	40
Table 13:	Noise Prediction Results – Proposed Development plus Drumduff Existing and Burnhead	40
Table 14:	Increase in Noise caused by the Proposed Development	41
Table 15:	ONB, Predicted Noise from Burnhead and the RNB	41
Table 16:	Predicted Noise from the Proposed Development plus Existing Drumduff Compared to the RNB	41
Table 17:	Noise Prediction Results – Proposed Development and Heights	42
Table 18:	Noise Prediction Results – Proposed Development and Heights, plus Drumduff Existing	42
Table 19:	Noise Prediction Results – Drumduff Existing and Burnhead	43
Table 20:	Noise Prediction Results – Proposed Development and Heights, plus Drumduff Existing and Burnhead	43
Table 21:	Increase in Noise caused by the Proposed Development plus Heights	43
Table 22:	ONB, Predicted Noise from Burnhead and the RNB	44
Table 23:	Predicted Noise from the Proposed Development Compared to the RNB	44
Table 24:	Summary of Effects	46

Figures

Figure 1: Turbine and receptor locations

Glossary of Terms

Term	Definition
The Applicant	Drumduff Extension Limited
The Agent	Atmos Consulting Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development.
Environmental Impact Assessment Regulations	The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations).
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations.
The Proposed Development	Drumduff Extension Wind Farm
The Proposed Development Site	The land enclosed by the Red Line Boundary as shown in Figure 1-1

List of Abbreviations

Abbreviation	Description
CEMP	Construction Environmental Management Plan
CMRA	Coal Mining Risk Assessment
DMP	Drainage Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ERP	Emergency Response Plan
FEI	Further Environmental Information
HES	Historic Environment Scotland
HMP	Habitat Management Plan
LVIA	Landscape and Visual Impact Assessment
MOD	Ministry of Defence
ONB	Overall Noise Budget
PMP	Peat Management Plan
PPP	Pollution Prevention Plan
RNB	Remaining Noise Budget
RVAA	Residential and Visual Amenity Assessment
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SSSI	Site of Special Scientific Interest
WLC	West Lothian Council
WoSAS	West of Scotland Archaeology Service
WSI	Written Scheme of Investigation
WQMP	Water Quality Monitoring Programme

1 Introduction

On 12 June 2023, Drumduff Extension Limited ('the Applicant') submitted a planning application (Ref. No: 0504/FUL/23) to West Lothian Council (WLC) seeking planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) ('the Planning Act') for the construction and operation of an electricity generating station known as Drumduff Extension Wind Farm (the 'Proposed Development'). The Proposed Development is an extension to an existing operating wind farm ('Drumduff Wind Farm').

The application included an Environmental Impact Assessment (EIA) Report, prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations).

This addendum to the EIAR contains further environmental information that has been collated to supplement the information submitted as part of the EIA and Planning Application (0504/FUL/23) and summarises the latest updates to the Proposed Development.

1.1 The Applicant

The Applicant is an associated company of GreenPower International Limited (GreenPower) and Thrive Renewables PLC. Formed over 20 years ago and based in Alloa, GreenPower is one of Scotland's leading independent renewable energy developers and is well known in the West Lothian region for developing and operating the existing Drumduff Wind Farm as a joint venture with Thrive Renewables, a leading company in sustainable energy investment.

1.2 The Project Team

This addendum report has been undertaken by Atmos Consulting with assistance from specialist consultants listed in Table 1. All are suitably qualified and competent experts in their field, as is required under the EIA Regulations.

Table 1: FEI Project Team

FEI Section	Authors	Statement of Competency
Section 1 and Hydrology	Atmos Consulting	Atmos has a proven track record in undertaking EIA in the onshore wind sector, built up over 15 years of experience working in the industry and leading EIA projects. The team is appropriately qualified, and assessments are overseen by experts with at least ten years' experience in their field.
Landscape and Visual	HEPLA	HEPLA is led by Peter Dunmow, an experienced Chartered Landscape Architect. Peter has twenty-nine years of experience in Landscape Architecture and Renewables Planning, managing and working on a range of projects throughout the UK.
Cultural Heritage	AOC Archaeology	AOC is a Registered Organisation of the Chartered Institute for Archaeologists. AOC is ISO 9001:2015 accredited. The staff are qualified

FEI Section	Authors	Statement of Competency
		professional archaeologists and members of the Chartered Institute for Archaeologists (CIfA) with extensive experience of the preparation of Cultural Heritage and Archaeology Impact Assessments for large scale rural and urban wind farm developments.
Noise	Hayes McKenzie	Hayes McKenzie Partnership Ltd has been involved with over 1000 onshore wind projects in the UK and overseas at the planning, post-planning and operational stages of development as well at public inquiry. Hayes McKenzie is a member of the UK Association of Noise Consultants (ANC). All work is carried out in line with recognised industry standards, and best practice of the IOA and ANC.
Ecology and Ornithology	Natural Power	Natural Power is an independent consultant and service provider working exclusively on green energy projects. With over 15 years of experience, the team are appropriately qualified at delivering expert advice for over 3,500 projects.
Transport and Access	Pell Frischmann	Pell Frischmann's Transport Planning experience has been developed over four decades, providing consultancy services across the breadth of the Buildings, Highways & Transportation and Land Development sectors.

1.3 Purpose of this Addendum Report

This Addendum Report has been produced to provide:

- An update to the Proposed Development description;
- A review of the potential for significant environmental effects associated with revisions to the design of the Proposed Development;
- A summary and review of statutory consultation responses to the Planning Application (0504/FUL/23); and
- Consideration of the assessment of cumulative effects with respect to the proposed neighbouring wind farm (0434/FUL/23) known as 'Heights Wind Farm'.

Much of the assessment reported within the EIAR remains relevant to the Proposed Development, therefore, this addendum does not seek to repeat text or replace the existing documents, except where changes in the baseline, assessment methodology or assessment results have been identified.

This addendum should be read in conjunction with the EIAR and sets out how the predicted effects of the Proposed Development differ from that presented in previous documents.

1.4 Structure of Report

This addendum report presents the findings of the updated EIA by describing the revised Proposed Development and focuses on changes to the likely significant effects which may result.

The addendum will be presented in two volumes as detailed below:

- Volume 1
 - Section 1: Introduction;
 - Section 2: Development Description;
 - Section 3: Supplementary Information; and
 - Section 4: Cumulative Assessment.
- Volume 2
 - Visualisations.

1.5 Contact Details

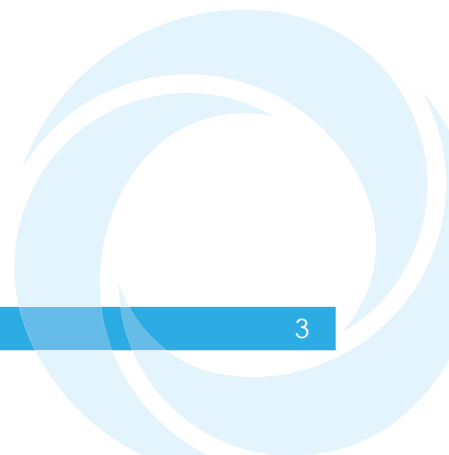
Electronic copies of the addendum report will be available to view at the following locations:

- On West Lothian Council Planning Portal at <https://planning.westlothian.gov.uk/publicaccess/>; and
- The Applicant's website at <https://greenpowerinternational.com/current-projects/drumduff-wind-farm-extension/>

Hard copies can be purchased by contacting GreenPower at enquiries@greenpowerinternational.com.

Charges for hard copies are:

- £65 for a paper hard copy;
- £30 for a link or CD/USB with access to all digital documents, including the EIA Report in full.



2 Updated Development Description

2.1 Introduction

This Section provides an update to the Proposed Development description and highlights any changes to associated infrastructure.

The Proposed Development description is outlined in Chapter 3 of the EIA Report and is summarised below for reference.

"The Proposed Development consists of three turbines up to a maximum 149.9m tip height and associated infrastructure. The associated infrastructure includes:

- Upgrading of existing track and construction of 2.02km of new access tracks and turnheads (of which approximately 1.30km will be cut and 0.69km will be floated);*
- Construction of turbine foundations and temporary crane hardstandings;*
- Underground cabling;*
- Construction of a substation and control room;*
- Construction of a Temporary Construction Compound; and*
- One watercourse crossing.*

The only changes to the original development description include:

- A reduction in height of one turbine (T3); and*
- Amendments to the track layout through micro-siting."*

2.2 Reduced T3 turbine height

Following submission of the Planning Application (0504/FUL/23) for the Proposed Development, consultation has been carried out between the Applicant and West Lothian Council (WLC).

The consideration of potential landscape and visual effects of the Proposed Development was discussed, particularly with regards to receptors located south of the Proposed Development Site. More detail on this and other consultation responses are provided in Section 3 and Table 2 of this Report.

The following amendment to the Proposed Development description is therefore proposed:

- Reduced height of the southernmost turbine, T3, to a maximum blade tip height of 135m.**

2.3 Amendments to track layout

Further to the reduced height of Turbine T3, consultation responses from NatureScot (further detailed in Section 3, Table 2) sought further consideration of the location of floating tracks on areas with peat deeper than 1m.

A review of the site infrastructure has been undertaken by Pell Frischmann. To reduce the infrastructure on site, it is proposed that cranes would be mobilised at Turbine 3 and would then travel south to erect Turbine 2 whilst partly or fully mobilised. This would reduce the need for physical infrastructure around Turbine 2 and would eliminate the need for the auxiliary boom supports at the crane pad.

A discussion with the turbine erection engineers used by the turbine suppliers has been undertaken to review the site layout and this proposal. They have advised that the proposals are feasible.

It is suggested that micrositings of tracks and other infrastructure is undertaken at the detailed design stage and post ground investigations, in consultation with the appropriate stakeholders.

The amendments to the infrastructure detailed in section 2.2 and 2.3 are presented in an updated Figures A1-2 Site Layout and Figure A8-4 Interpolated Peat Depth. This new layout (Appendix A of this addendum) supersedes the previous version submitted as part of Volume 4a of the EIA for the Proposed Development.

3 Supplementary Information

3.1 Introduction

This Section provides a summary of the consultation responses from statutory consultees in relation to the Proposed Development EIA Report and associated planning documents as submitted in June 2023. Details of further information requested by consultees have also been outlined in Table 2 and are further addressed in this section.

3.2 Statutory Consultation

A summary of statutory consultation responses to the Proposed Development (0504/FUL/23) has been provided in Table 2.

The contents of Table 2 provide a summary of consultation topics or raised in relation to the Proposed Development and the actions or outcomes addressed and is not intended to be an exhaustive list of consultation responses to the Drumduff Extension Wind Farm planning application.

Table 2: Summary of Consultee Responses

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
Access	Scottish Rights of Way and Access Society (Scotways)	<p>Holding objection – more information required</p> <p>Scotways identified LW108 as a right of way in close proximity to the Proposed Development Site.</p> <p>Scotways welcomes proposals to enhance recreational access and note Vol. 4a Figure 13-1 Paths and Recreational Access, however this proposed route is situated in close proximity to turbine locations and consideration of recommended buffer distances from turbines is requested.</p> <p>It is recommended that the siting of turbines to established paths and rights of way be distance- equivalent to the height of the blade tip, from the edge of any public highway (road or other public right of way) or railway line.</p>	<p>Clarification and enhancement opportunities are provided in Chapter 13 of the EIAR.</p> <p>Turbine 2 is the closest turbine to LW108 and complies with Scotways recommendation. It is likely due to site constraints (high pressure gas pipes) that turbines will be micrositied further away from LW108 and not closer.</p> <p>Consultation with WLC's access team will be carried out in forming an access management plan.</p>
Access	West Lothian Council (WLC)	<p>No objection with condition</p> <p>The recommended planning condition requires a detailed access plan to show:</p> <ul style="list-style-type: none"> all existing paths, tracks and rights of way, and any areas currently outwith statutory access rights 	<p>Clarification is provided in Chapter 13 of the EIAR.</p> <p>Prior to the commencement of works, a detailed plan</p>

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
		<ul style="list-style-type: none"> any areas proposed for exclusion from statutory access rights, for reasons of privacy, disturbance or curtilage; all paths and tracks proposed for construction, for use by walkers, riders, cyclists, all-abilities users, etc. any diversions of paths - temporary or permanent - proposed for the purposes of the development. 	of public access across the Proposed Development Site will be provided for WLC approval.
Aviation	Edinburgh Airport	<p>Holding objection – pending re-assessment</p> <p>The proposed turbines are located approximately 25km WSW of the Aerodrome Reference Point for Edinburgh Airport. Turbine 3 at 149.9m high is visible to the radar at the airport, causing detrimental effect on Air Traffic Control operations.</p>	<p>Consultation is outlined in Table 15-1 Chapter 15 of the EIAR.</p> <p>Appropriate mitigation measures have been identified and confirmed.</p> <p>Turbine 3 of the Proposed Development has been reduced to a maximum tip height of 135m.</p>
Aviation	NATS	<p>Objection</p> <p>No impact is anticipated on NATS':</p> <ul style="list-style-type: none"> Navigation aids; and Radio communications infrastructure. <p>A technical impact is anticipated on radar communications, with inadequate terrain screening of the Proposed Development Site to the following:</p> <ul style="list-style-type: none"> Lowther; Glasgow; Cumbernauld; and Kincardine. 	<p>Consultation is outlined in Table 15-1 Chapter 15 of the EIAR.</p> <p>Discussions are ongoing with this consultee, and mitigation measures have been confirmed and will be implemented post consent.</p>
Aviation & Defence	Ministry of Defence (MOD)	<p>No objection with condition</p> <p>MOD require conditions are added to any consent issued requiring that the development is fitted with aviation safety lighting and that sufficient data is submitted to ensure that structures can be accurately charted to allow deconfliction. As a minimum the MOD would require that the turbines are fitted with 25cd visible or infra-red (IR) lighting.</p>	<p>Consultation is outlined in Table 15-1 Chapter 15 of the EIAR.</p> <p>The MOD is to be consulted following the reduction in height of Turbine 3.</p>

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
Biodiversity	WLC	<p>Holding objection – more information required</p> <p>In line with NPF4 Policy 3, the development is required to protect biodiversity, reverse biodiversity loss, deliver positive effects from the development and strengthen nature networks.</p> <p>WLC has requested more information for clarity on what measures are required for mitigation/compensation, and those proposed for enhancement.</p>	<p>Details of mitigation and biodiversity enhancement have been included in Chapter 6 of the EIAR.</p> <p>Further information has been provided by Natural Power in this addendum using WLC's 'Delivering Positive Effects for Biodiversity' template.</p>
Coal	The Coal Authority	<p>No objection (Material consideration)</p> <p>The Planning Application is accompanied by a Coal Mining Risk Assessment Report (February 2023, prepared by EnviroSolution Ltd.)</p> <p>The Coal Authority's Planning Team concurs with the conclusions of the Coal Mining Risk Assessment report and as such, recommend planning permission be granted for the Proposed Development with conditions included on the Decision Notice.</p> <p>These conditions are summarised as:</p> <ol style="list-style-type: none"> 1. No development shall commence (excluding the demolition of existing structures and site clearance) until a scheme of intrusive investigations has been carried out and any remediation works or mitigation measures, as necessary, have been implemented. <p>A signed state of declaration is required prior to Proposed Development use to confirm the conditions in item 1 have been suitably undertaken.</p>	<p>The Coal Mining Risk Assessment is included in Technical Appendix 8-3 of the EIAR.</p>
Cultural Heritage	WLC	<p>Pending decision</p> <p>Following consultation with WLC in July 2023 it was decided to update the Cultural Heritage assessment to take account of the proposed wind farm at Heights Road (0434/FUL/23), adjacent to the Proposed Development Site. Additional wirelines are also required from the Scheduled Monuments of:</p> <ul style="list-style-type: none"> • Woodend Farm, Farmstead 1400m WSW Of (Asset 24, SM 11222); and • Craigmartyr, Farmstead 720m WNW Of (Asset 13, SM 11223). 	<p>Clarification is provided in Chapter 10 of the EIAR.</p> <p>Wireline visualisations have been produced in Volume 2 of this addendum:</p> <ul style="list-style-type: none"> • FEI Figure 22: Viewpoint CH1: Woodend Farmstead, Scheduled

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
		These wirelines should inform the EIA and principally consider the impact of the Proposed Development on the monuments' relationship with the surrounding moorland.	Monument; and <ul style="list-style-type: none"> FEI Figure 23: Viewpoint CH2: Craigmartyr Farmstead, Scheduled Monument.
Cultural Heritage	West of Scotland Archaeology Service (WoSAS)	No objection with condition WoSAS responded to the planning application 0504/FUL/23 on the 30 th of June 2023. With regard to settings effects WoSAS agreed that no significant operational effects have been identified. WoSAS agreed that a Written Scheme of Investigation (WSI) for a programme of archaeological works should be implemented and agreed by WoSAS before any development works takes place within the Proposed Development Site.	A WSI for a programme of archaeological works has been recommended as part of the mitigation as in Chapter 10 of the EIAR.
Ecology, Hydrology and Special Areas of Conservation	NatureScot	Holding objection (more information required) A Habitats Regulations Assessment (HRA) will be required to be carried out on Blawhorn Moss Special Area of Conservation (SAC). NatureScot welcome the bog restoration plans in the Outline Habitat Management Plan (Appendix 6-4 EIAR). Given the proximity of Blawhorn Moss to the Site, habitat enhancement work is recommended to be carried out in liaison and consultation with peatland ACTION and NatureScot National Nature Reserve staff currently undertaking restoration work within the SAC. It is noted, however, that the location of infrastructure and track between Turbines 2 and 3 have the potential to impact the hydrological function of the SAC. Additional consideration is requested for on the assessment of site integrity of the proposal in connectivity with the peat body within the SAC boundary. Finally, consideration of cumulative impacts of the Proposed Development and Woodend Windfarm (0434/FUL/23) on cumulative hydrological and aerial pollution impacts during construction (if constriction across the two sites has the potential to lead to cumulative impacts on the SAC) and operation be	Clarification on Ecology matters is provided in Chapter 6 of the EIAR and the Shadow HRA for Blawhorn Moss is included in Appendix 6-3. Clarification on Hydrology, Hydrogeology, Peat and Soils is provided in Chapter 8 of the EIAR. There is no hydrological connection from the peat body within the Proposed Development Site to Blawhorn Moss SAC. As watercourses within the Proposed Development Area flow away from the SAC. Further information on the latest changes to the Proposed Development infrastructure are provided in Section

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
		considered.	2.3. Further information and comment on the hydrological connectivity potential between the SAC catchment boundary, the site and the potential for cumulative impacts with the neighbouring proposed wind farm (Heights Wind Farm) is discussed in Section 3.3 below.
Ecology & Ornithology	WLC	<p>No objection (consideration)</p> <p>The Applicant has provided a robust EIA for the proposal in general terms. Further consideration is required on the following elements of the EIAR:</p> <p><u>Ecology</u></p> <ul style="list-style-type: none"> • Further discussion needed on Beech trees and potential effects on bats. • Confirmation is required on the presence of otter, water vole, pine marten and red squirrel within results. • Post-monitoring for species is recommended. <p><u>Ornithology</u></p> <ul style="list-style-type: none"> • Generally, agree with the findings and breadth of surveys. • There is the potential for cumulative impacts to occur given the presence of a nearby wind farm proposal that is worth consideration. • Further clarity is required on the species observed during flight survey records and recommend that species protection plans be put in place an appropriate ECoW appointed. • Additional surveys pre-construction & pre-felling will be required alongside long-term monitoring during operation. 	<p>Clarification on Ecology matters is provided in Chapter 6 of the EIAR and comments relating to consultation feedback are addressed in Appendix B of this addendum report.</p> <p>Clarification and inclusion of mitigation measures in line with those proposed are included in Chapter 7 of the EIAR Report and Chapter 16 (Schedule of Mitigation). Further supplementary information is also included in appendix B of this addendum report.</p>
Flooding	WLC	<p>No objection with condition</p> <p>The Proposed Development Site shows that some parts of it may be susceptible to 0.1%, 0.5% & 10% AEP's surface water flooding (SEPA's Flood Hazard Maps). In line with SEPA's Land Use Vulnerability guidance, the Proposed Development Site is considered "generally suitable where a flood risk location is required for operational reasons and an alternative lower-risk location is not available –</p>	<p>Clarification and further detail on hydrological matters are included in Chapter 8 of the EIAR.</p> <p>A drainage proposal will be provided prior to works commencing which will include</p>

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
		<p><i>development should be designed and constructed to be operational during floods (i.e. 0.5% AEP), and not impede water flow."</i></p> <p>Recommend a drainage proposal be brought forward.</p>	<p>basic measures to treat runoff and control the forward flow of surface water from the Proposed Development Site.</p>
Hydrology, Peat and Forestry	WLC	<p>No objection (consideration)</p> <p>The Applicant has provided a robust EIA for the proposal in general terms. Some considerations on matters include:</p> <p><u>Peat and Forestry</u></p> <ul style="list-style-type: none"> A significant amount of peat will be required to be permanently excavated. Whilst there is a plan for reuse of material for restoration the effects have been considered in consideration of the operational timescales of the Proposed Development and does not place sufficient consideration of tree restocking beyond the application timescales. It is proposed that the Planning Authority consider Scottish Forestry's agreement with the proposal in line with appropriate species choice and habitat. Further discussion of off-site replanting is also recommended. <p><u>Hydrology and Peat</u></p> <ul style="list-style-type: none"> Review of the Site Layout suggests that there may be potential for sections of deeper peat on the site to be avoided in consideration and review of infrastructure and floating tracks. It is recommended that specialist advice be sought from SEPA and NatureScot and conditions be required in line with Good Practice Wind Farm construction guidance. It is agreed that with mitigation, the hydrology of Blawhorn Moss is not likely to be affected, however further consideration on local biodiversity may be required, particularly East Blawhorn Moss. 	<p>Clarification and further information of forestry plans are provided in Chapter 12 of the EIAR and further detail on hydrology, hydrogeology, peat and soils is included in Chapter 8 of the EIAR.</p> <p>The Site Layout and placement of infrastructure, particularly in regard to the section south of Turbine 2 (in peat deeper than 1m) has been revised and changes have been made. The updated site layout is presented in Appendix A of this EIA addendum report, and a summary of the key changes to infrastructure are outlined in Section 2.3 above.</p> <p>The Carbon Calculator (Technical Appendix 14-1) and Carbon Balance (Chapter 14 of the EIAR) has also been updated. The inputs and key findings of the Carbon Calculator are presented in Appendix C of this EIA addendum.</p>

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
Hydrology and Peat	SEPA	<p>No objection – advice for planning authority</p> <p>SEPA have been consulted on matters relating to those outlined above in terms of the integrity of Blawhorn Moss peat body with that of the proximity with the Proposed Development Site.</p> <p>There is a complex drainage system in the area so care must be taken when drain blocking to ensure no negative effects impact Blawhorn Moss SAC. The use of floating tracks will assist in alleviating this issue.</p> <p>Restoration proposals are appropriate and forest to bog plans are welcomed. It is recommended that restoration proposals are undertaken in conjunction with Blawhorn Moss SAC management – early engagement is encouraged. Coniferous regeneration within restoration areas should also be managed.</p> <p>Further information on peat and groundwater dependent terrestrial ecosystems (GWDTE) would be recommended, however for a proposal of this scale, SEPA would not typically comment.</p> <p>SEPA recommend standing advice and best practice measures are followed.</p>	<p>Consideration of hydrological and peat matters are provided in Chapter 8 of the EIAR.</p> <p>The Site Layout and placement of infrastructure, particularly in regard to the section south of Turbine 2 (in peat deeper than 1m) has been revised and changes have been made. The updated site layout is presented in Appendix A of this EIA addendum report, and a summary of the key changes to infrastructure are outlined in Section 2.3 above.</p> <p>SEPA's recommendation on standing advice and best practice will be adhered to, and ground surveys will be carried out with the relevant consultants pre-construction.</p>
Landscape and Visual	WLC	<p>Pending decision</p> <p>Consultation specifically relating to Landscape and Visual effects have been on-going throughout the Proposed Development project programme, from initial design to post-submission. This has been undertaken primarily between the Applicant and WLC.</p> <p>Post-submission consultation discussed the potential for visual effects on the development on residences particularly to the south of the Proposed Development Site. WLC also sought for inclusion of the Heights Wind Farm proposal (0504/FUL/23) to be included in cumulative assessment and updated on all wirelines and in photomontages for key viewpoints:</p>	<p>Clarification is provided in Chapter 5 of the EIAR.</p> <p>Volume 2 of this addendum report provides updated wirelines and photomontages that include Heights Wind Farm. Further cumulative assessment of the landscape and visual effects have been included in Section 4.2 of this addendum.</p>

Subject Area	Consultee	Post-submission consultation	Addressed by the Applicant
		<ul style="list-style-type: none"> VP1 – Blawhorn Moss VP2 – Beechbrae Woodland Centre VP3 – Eastcraigs Hill VP4 – Hillside VP6 – Avonbridge VP10 – Cairnpapple Hill VP13 – Matthews Crofts <p>With an additional wireline and photomontage produced at the B718 off Harthill Road.</p>	
Noise	WLC	<p>Holding objection – pending decision</p> <p>WLC's Environmental Health Department received the proposed noise assessment methodology dated 7th December 2022.</p> <p>WLC confirmed in February 2023 that they had read the proposed assessment methodology and confirmed that it was acceptable.</p> <p>An operational noise impact assessment was carried out in line with the assessment methodology submitted to the Council.</p> <p>Post-submission of the EIAR, WLC's Environmental Health request consideration of cumulative assessment with the Heights Wind Farm (0434/FUL/23).</p>	<p>Clarification is provided in Chapter 11 of the EIAR.</p> <p>An updated cumulative noise assessment has been provided in Section 4.4 of this EIA addendum report.</p>
Transport	Transport Scotland	<p>No objection with condition</p> <p>Transport Scotland have attached conditions to any permissions the council may give:</p> <ul style="list-style-type: none"> Proposed routes for abnormal loads (AL) are to be approved by WLC; Junction widening and traffic management to be approve prior to commencement of AL; and Prior to movement of construction materials, any additional traffic measures must be approved by Transport Scotland. 	<p>Clarification is provided in Chapter 9 of the EIAR.</p> <p>All conditions will be carried out in compliance with the relevant guidance and good practice guides.</p> <p>Trunk road works, if required, will be in agreement with the Trunk Roads Authority prior to the commencement of works.</p>

Consultation responses were also received from the following consultees with no objections include:

- Glasgow Airport
- Historic Environment Scotland (HES)
- Scottish Water
- National Gas Transmission

3.3 Hydrological connectivity potential – Blawhorn Moss SAC catchment

NatureScot have disagreed with the conclusion of the Shadow HRA (Appendix 6-3 of the EIA Report), that the Proposed Development will not affect the integrity of Blawhorn Moss SAC. They advise that the location of turbine 2 and the track between turbines 2 and 3 have the potential to impact the hydrological function of the SAC. NatureScot believe this is due to the potential connectivity of the peat body that will be impacted by the Proposed Development (around the track between T2 and T3) and the peat body within the SAC.

In response to this, the Applicant has revised the infrastructure, specifically the access tracks between T2 and T3 – the updates of which are presented in Section 2.3. With the removal of two crane boom hardstandings within the peat body and the revision to the length and areas of floating track (as presented in Appendix A, Figure A8-4 Interpolated Peat Depth), it is expected that, from a hydrological perspective, the integrity of the peat body within the site boundary is very unlikely to be subject to significant effects due to the lack of direct hydrological connectivity between the two. Therefore, the likelihood of impact on the peat body within the SAC due to direct hydrological effects is very unlikely. The proposed infrastructure layout was designed to avoid any upgrade works to the existing track that directly borders the Blawhorn Moss SAC.

In terms of the potential for indirect effects to the peat body within Blawhorn Moss SAC, potential impacts from aerial deposition may arise from dust, spillages or pollution associated with the construction of the Proposed Development. These are outlined and assessed in Chapter 8, Volume 2 of the EIA Report. A Construction Environmental Management Plan (CEMP) will be made prior to construction which includes:

- Drainage Management Plan (DMP);
- Pollution Prevention Plan (PPP);
- Peat Management Plan (PMP);
- Habitat Management Plan (HMP);
- Emergency Response Plan (ERP); and
- Water Quality Monitoring Programme (WQMP).

Further detail is provided in Section 8.5 of Chapter 8, Volume 2 of the EIA Report. Taking consideration of this mitigation the residual effects on hydrological, hydrogeological and peat receptors within Blawhorn Moss is assessed as being negligible and not significant in EIA terms. As stated in Chapter 8: Hydrology, Hydrogeology, Peat and Soils of the EIA Report, watercourses within the Proposed Development Area flow away from Blawhorn Moss SAC and north and away from the proposed development boundary for Heights Wind Farm (where no pathways connecting the sites for access are proposed). Figures 8-1 and 8-1-1 of the EIA Report (Volume 4a) show the surface water features on and around the Proposed Development Site and the Elevation of the area, respectively. Additionally, the topography of the area is such that the peat body within the Proposed Development Site between turbines 2 and 3 is downslope of the SAC. Therefore, there is no hydrological connection from the peat body within the Proposed Development Site to Blawhorn Moss SAC.

Furthermore, the Proposed Development includes a HMP with the aim of restoring areas that are currently planted with conifers to raised bog. This will increase the total area of raised bog within the vicinity of the SAC and will improve the ecological connectivity of East Blawhorn LBS and Blawhorn Moss SAC. Additionally, impacts on the SAC from conifer plantations will be reduced as a result of conifer felling for the Proposed Development. It is therefore considered that the Proposed Development will not adversely impact the integrity of the SAC.

4 Cumulative Assessment

4.1 Introduction

This Section presents updated cumulative assessment of the Proposed Development.

The updated cumulative assessments have been requested by WLC and statutory consultees as outlined in Section 3, Table 2 to consider the neighbouring proposed wind farm development, known as 'Heights Wind Farm' (0434/FUL/23). Cumulative assessment updates have been requested for:

- Landscape and Visual (Section 4.2);
- Cultural Heritage (Section 4.3); and
- Noise (Section 4.4).

4.1.1 Assessment Methodology

The assessment methodology used in this FEI Report (Section 4) is the same as that presented in the respective chapters of the Proposed Development EIA Report (June 2023) unless otherwise stated.

4.1.2 Cumulative Assessment

The assessment of cumulative effects has been carried out using currently available assessment techniques as appropriate to each technical specialism considered in this Section.

4.1.3 Assumptions and Limitations

A general assumption has been made during preparation of this FEI report in which information provided by third parties, including publicly available information and databases, is correct at the time of publication.

4.2 Landscape and Visual

4.2.1 Introduction

Background

Following on from the consultation responses from WLC and subsequent meetings with the Applicant, an adjustment is to be made to the Proposed Development based on the reduction in height of the southernmost turbine, Turbine 3 (T3), to a maximum blade tip height of 135m (from the EIAR height of 149.9m). The design change is intended to reduce effects on receptors to the south of the Proposed Development.

In addition, WLC have requested that additional information provided in relation to the neighbouring wind farm (0434/FUL/23) known as 'Heights Wind Farm' which submitted their application at a similar time as the Applicant, WLC have requested some supplementary information that provides:

- An updated cumulative assessment of all viewpoints (VPs) including Heights Wind Farm;

- Updated wirelines and photomontages to illustrate the Heights Wind Farm & Drumduff Extension Wind Farm; and
- Assessment from an additional VP taken from Harthill Road, Blackridge.

Details of the consultations are included in Section 3 of this FEI Report. Updated figures and photomontages are included in Volume 2 of this Report.

This section provides a revised assessment of the effects on local landscape resources and visual amenity that would be likely to result from the construction, operation and maintenance (O&M) and decommissioning of the Proposed Development.

The updated Landscape and Visual Impact Assessment (LVIA) has been prepared to provide an understanding of the effects of the Revised Scheme. The revised assessment is tabulated, with detailed assessment included, where appropriate, to examine the reduced effects.

The LVIA chapter has been prepared by a Chartered Landscape Architect at Heritage Environmental Planning and Landscape Architecture Limited (Hepla).

4.2.2 Reading Guide

The baseline landscape and visual conditions currently existing within the Proposed Development Site and within the surrounding study area are fully described in the Environmental Impact Assessment (EIA) Report. For the purposes of this update to the assessment, the baseline previously described in the EIA Report is unchanged.

This update to the LVIA concentrates on the key landscape and visual issues identified during the scoping stage and through correspondence with WLC in relation to:

- landscape effects – both physical changes to constituent elements of the landscape fabric, and how changes in the character and qualities of the landscape and designated areas are perceived by people, as a result of the Proposed Development; and
- visual effects – changes to views or visual amenity, as experienced by people, from key viewpoints, the surrounding land and sea, settlements, roads, footpaths and cycle routes, as a result of the Proposed Development.

The assessment of effects set out in the LVIA chapter of the EIA Report is superseded by the information contained within this FEI Report.

4.2.3 Methodology

In the EIA Report, the landscape methodology, as described in Chapter 5, Section 5.4, was based upon the Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, 2013. There have been no changes to the appropriate guidance since this time. The methodology used in this update of the LVIA remains as set out in Appendix 5.1 of the EIAR.

4.2.4 Supporting Graphics

This update to the LVIA has been informed by the figures listed below and included in Volume 2 of this FEI Report.

- Figure FEI 1, Viewpoint Location Plan (including the additional viewpoint location 15)
- Figure FEI 2, Blade Tip Zone of Theoretical Visibility (Within 40km)

- Figure FEI 3, Hub Height Zone of Theoretical Visibility (within 40km)
- Figure FEI 4a, Blade Tip ZTV with Designations and Cycle Routes to 20km
- Figure FEI 4b, Blade Tip ZTV with Landscape Character within 20km
- Figure FEI 5, Cumulative Wind Farms within 10km
- Figure FEI 6, Cumulative ZTV with Heights Wind Farm
- Figure FEI 7, VP1 - Blawhorn Moss
- Figure FEI 8, VP2 - View north from Beechbrae Woodland Centre
- Figure FEI 9, VP3 - East Craigs Hill
- Figure FEI 10, VP4 - View north Junction of Heights Road and Hillside Place
- Figure FEI 11, VP5 - Black Loch
- Figure FEI 12, VP6 - View south from Avonbridge, beside Avonbridge Parish Church
- Figure FEI 13, VP7 - Minor Rd North of Slamannan
- Figure FEI 14, VP8 - Adjacent to Golf Driving Range at Polkemmet Country Park
- Figure FEI 15, VP9 - Hillend Reservoir, Caldercruix
- Figure FEI 16, VP10 - Henge and Cairn at Cairnpapple Hill
- Figure FEI 17, VP11 - Wallace's Bed, Bathgate Hills
- Figure FEI 18, VP12 - West Cairn Hills, Pentland Hills
- Figure FEI 19, VP13 - No. 7, Matthews Crofts
- Figure FEI 20, VP14 - Knowhead Farm, Blairmuckhill Road
- Figure FEI 21, VP15 - Harthill Road, Blackridge

4.2.5 Updated Assessment of Residual Effects

Following the change in design of the Proposed Development (as presented in Section 2.2 of this Report) for the Revised Scheme, a re-assessment of the residual effects upon the receptors identified in the EIA Report has been undertaken. This re-assessment focusses on any changes to the reported significant effects, and in relation to Heights Wind Farm, an update to the cumulative assessment for the 15 viewpoints has been included in this FEI. In addition, a full viewpoint assessment is included for the new Viewpoint 15, Harthill Road Blackridge. This assessment assumes that all mitigation detailed within the EIA Report is undertaken.

The tabulated update to the assessment in Table 3 below lists and summarises the revised Landscape effects, focussing on those effects where a significant effect was found in the EIAR. Aside from the addition of Heights Wind Farm planning stage site, the cumulative effects remain as stated in the EIA Report.

Table 3: Summary of Predicted Significant Landscape Effects of the Proposed Development

Receptor	Effect (Original Scheme)	Summary of Changes	Effect (Revised Scheme)
Significant Construction Effects on the Landscape Fabric			
Direct effects on the landscape fabric	There will be a local Major/Moderate level of direct effect on a small area of the existing	Within the Proposed Development Site, the turbines and associated infrastructure will lead to the physical loss of discrete areas of forestry and moorland through the creation of access tracks, turbine foundations,	The change in the height of T3 will have no important changes to the reported effects which remain as stated:

Receptor	Effect (Original Scheme)	Summary of Changes	Effect (Revised Scheme)
	fabric of the landscape, which is considered to be Significant .	crane hardstandings, etc.	Major/Moderate , Significant direct effect on the fabric of the landscape.
Significant Construction Visual Effects			
Views within 1-2km	The Proposed Development will give rise to a Major and Significant visual effect locally (within approximately 1km) during construction albeit this will be of limited duration.	The change in the height of T3 will have no important changes to the reported effects.	Effects remain as stated in the EIAR: Major and Significant visual effect locally (within approximately 1km) during construction.
Significant Operational Landscape Effects			
Direct effects on the landscape fabric	There will be a local Major/Moderate level of direct effect on a small area of the existing fabric of the landscape, which is considered to be Significant .	Within the Proposed Development Site, the turbines and associated infrastructure will lead to the physical loss of discrete areas of forestry and moorland through the creation of access tracks, turbine foundations, crane hardstandings, etc. These elements will be unchanged by the proposed variation.	The change in the height of T3 will have no important changes to the reported effects which remain as stated: Major/Moderate , Significant direct effect on the fabric of the landscape.
Landscape Character Type 273: Lowland Plateaux – Lothians (host LCT) The LCT is covered in part by the Blackridge Heights SLA	The Proposed Development will give rise to locally Major/Moderate and Significant effects on those parts of the LCT that lie within c.1.5km of the site.	The change in the height of T3 will slightly reduce the influence of the Proposed Development on the LCT, particularly to the south, east and south east of the LCT.	The change in the height of T3 will have no important changes to the reported effects which remain as stated: Major/Moderate and Significant effects on those parts of the LCT that lie within c.1.5km of the site.
Cumulative Effects:			
	<i>Additional Effect:</i> locally Moderate/Minor and Not Significant due to the consented sites at East Riggs and Rigg Wind. <i>Total Effect:</i> Minor and Not Significant cumulative effects from this LCT due to the planning stage Dewshill site.	There will be no change to the <i>additional</i> effects arising from the Proposed Development. The <i>total</i> cumulative effect of built, consented and planning stage schemes would result in an increase in the influence of wind farm development within the eastern sector of the LCT due principally to the combined effects with the planning stage site at Heights Wind Farm.	<i>Additional Effect:</i> locally Moderate/Minor and Not Significant due to the consented sites at East Riggs and Rigg Wind. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects from this LCT due to combined effects with Heights Wind Farm planning

Receptor	Effect (Original Scheme)	Summary of Changes	Effect (Revised Scheme)
			stage site. This will have an important effect on the special qualities of the Blackridge Heights SLA.

The tabulated update to the assessment in Table 4 below lists and summarises the revised effects visual effects, focussing on those effects where a significant effect was found in the EIAR. Aside from the addition of Heights Wind Farm planning stage site, the cumulative effects remain as stated in the EIA Report.

Table 4: Summary of Predicted Significant Visual Effects of the Proposed Development

Significant Operational Visual Effects			
Settlement - Blackridge	The Proposed Development will give rise to Major and Significant local effects on the northern edge of Blackridge at Matthews Crofts and the southern extent of Heights Road at the junction with Hillside Place.	The reduction in the height of Turbine 3 will reduce the extent of visibility. The upper section of the tower, the nacelle and the turbine blades will remain visible from properties the edge of the settlement at Heights Road and also from Mathew's Crofts, Figures FEI 10 and 19 respectively.	The change in the height of T3 will reduce visibility from the northern edge of the settlement. Overall, the reported effects remain as stated: Major and Significant local effects on the northern edge of the settlement.
	Cumulative Effects:		
	<i>Additional Effect:</i> locally Moderate/Minor and Not Significant due to the consented sites at East Riggs and Rigg Wind. <i>Total Effect:</i> Minor and Not Significant cumulative effects from this LCT due to the planning stage Dewshill site.	<i>Additional Effect:</i> locally Moderate/Minor and Not Significant due to the consented sites at East Riggs and Rigg Wind. The <i>total</i> cumulative effect of built, consented and planning stage schemes would result in an increase in the influence of wind farm development on the settlement at Blackridge due principally to the combined effects with the planning stage site at Heights Wind Farm.	<i>Additional Effect:</i> locally Moderate/Minor and Not Significant due to the consented sites at East Riggs and Rigg Wind. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.

The tabulated update to the assessment in Table 5 below lists and summarises the revised effects at Viewpoints 1 to 14, providing a summary update to all the viewpoints that were assessed in EIAR. Aside from the addition of Heights Wind Farm planning stage site, the cumulative effects remain as stated in the EIA Report.

Table 5: Summary of Predicted Significant Landscape Effects of the Proposed Development

Significant Operational Landscape Effects			
Viewpoint 1, Blawhorn Moss	The Proposed Development will give rise to Major/Moderate and Significant effects on visitors/walkers who are of High sensitivity from this viewpoint.	As illustrated in Figure FEI 7d, Turbine 3 will reduce in height, reducing the influence of the eastern edge of the array, giving the impression that the turbine is set slightly further back, rounding off the eastern extent of the array.	The change in the height of T3 will slightly reduce visibility from Blawhorn Moss. Overall, the reported effects remain as stated: Major/Moderate and Significant effects on visitors/walkers
	Cumulative Effects:		
	<i>Additional Effect:</i> Moderate, Not Significant effect combined cumulative effects with the baseline of the built sites at Burnhead/ Drumduff and the consented site at East Craigs. <i>Total Effect:</i> No additional total cumulative effects of built consented and planning stage sites are predicted.	As illustrated in Figure FEI 7e, The Proposed Development will be seen in direct combined views with the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen beyond the Proposed Development and will appear as part of the same extent wind farm. The horizontal extent of the visible wind farm development will not be increased however, the apparent density and the extent of overlapping and discordant turbines will increase. This will increase the magnitude of cumulative change.	<i>Additional Effect:</i> no important changes to the reported effects which remain as stated: Moderate, Not Significant. <i>Total Effect:</i> Major and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 2, Beechbrae Woodland Centre	Major/Moderate and Significant effects on visitors who are of High sensitivity from this viewpoint, and Moderate and Not Significant effects on Road Users who are of Medium sensitivity.	As illustrated in Figure FEI 8d, Turbine 3 will reduce in height, reducing the influence of the eastern edge of the array, giving the impression that the turbine is set slightly further back.	The change in the height of T3 will slightly reduce visibility from Viewpoint 2. Overall, the reported significant effects remain as stated: Major/Moderate and Significant effects on visitors who are of High sensitivity
	Cumulative Effects:		
	<i>Additional Effect:</i> Moderate, Not Significant effect combined cumulative effects with the baseline of the built sites at Burnhead/ Drumduff and the consented site at East Craigs.	As illustrated in Figure FEI 8f, the Proposed Development will be seen in direct combined views with the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen above the Proposed Development and will extend the footprint of wind turbines to the east. The turbines will appear as part of the same extended wind farm. The horizontal extent of the visible wind	<i>Additional Effect:</i> no important changes to the reported effects which remain as stated: Moderate, Not Significant. <i>Total Effect:</i> Major and Significant cumulative effects due to combined effects with Heights Wind Farm

	<i>Total Effect:</i> No additional total cumulative effects of built consented and planning stage sites are predicted.	fam development will be increased. This will increase the magnitude of cumulative change.	planning stage site.
Viewpoint 3, East Craigs Hill	The Proposed Development will give rise to Major/Moderate and Significant effects on walkers who are of High sensitivity from this viewpoint.	As illustrated in Figure FEI 9d, Turbine 3 will reduce in height. The nacelle of the turbine will be lower, appearing at a similar height to the turbines to the north. This effect both increases the cohesion of the overall array gives the impression that the array is set slightly further back from East Craigs Hill and the expansive pastures in the foreground.	The change in the height of T3 will improve the wind farm composition in views from East Craigs Hill. Overall, the reported significant effects remain as stated: Major/Moderate and Significant effects on walkers who are of High sensitivity.
Cumulative Effects:			
	<i>Additional Effect:</i> Moderate, Not Significant effect combined cumulative effects with the baseline of the built sites at Burnhead/ Drumduff, Easter Drumclair and South Amloss and the consented sites at East Craigs, Drumclair Extension, Greengairs, Greengairs East. Moderate, Not Significant cumulative effect. <i>Total Effect:</i> No additional total cumulative effects of built consented and planning stage sites are predicted.	As illustrated in Figure FEI 9i, the Proposed Development will be seen in direct combined views with the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen in the foreground and to the north of the Proposed Development extending the footprint of wind turbines beyond the forestry area and into the open rough pastures to the east. The turbines will be dominant in views to the west. This will increase the magnitude of cumulative change. Figure FEI 9b-e illustrate the cumulative context in 360° views.	<i>Additional Effect:</i> no important changes to the reported effects which remain as stated: Moderate, Not Significant. <i>Total Effect:</i> Major and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 4, Heights Road/ Hillside Place	The Proposed Development will give rise to a Major/Moderate and Significant local effects on Residents who are of High sensitivity.	As illustrated in Figure FEI 10d, Turbine 3 will reduce in height, giving the impression that the turbine is set slightly further back, reducing the influence of the Proposed Development.	The change in the height of T3 will reduce visibility from the northern edge of Blackridge. Overall, the reported significant effects remain as stated: Major/Moderate and Significant effects on Residents who are of

			High sensitivity.
	Cumulative Effects:		
	<i>Additional Effect:</i> None. <i>Total Effect:</i> None.	As illustrated in Figure FEI 10e, The Proposed Development will be seen in direct combined views with the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen to the right of the Proposed Development and will appear as part of the same extended wind farm. The horizontal extent of the visible wind farm development will be increased, and the turbines appear closer and larger. This will increase the magnitude of cumulative change.	<i>Additional Effect:</i> None. <i>Total Effect:</i> Major and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 5, Black Loch	The Proposed Development will give rise to a Minor – Not Significant on Walkers.	As illustrated in wireframe in Figure FEI 11b, Turbine 3 will reduce in height, reducing the influence of the Proposed Development.	The reported effects remain as stated: Minor – Not Significant on Walkers
	Cumulative Effects:		
	The addition of the Proposed Development will result in Minor and Not Significant cumulative effects. No additional <i>total</i> cumulative effects are predicted.	As illustrated in wireframe in Figure FEI 11b, the Proposed Development will be seen, beyond, and in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. There will be a slight increase in the density of the combined array.	<i>Additional Effect:</i> Minor and Not Significant. <i>Total Effect:</i> Minor and Not Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 6, Avonbridge	The Proposed Development will give rise to a Minor – Not Significant effect on Residents/Visitors.	As illustrated in wireframe Figure FEI 12d, Turbine 3 will reduce in height, very slightly reducing the influence of the Proposed Development.	The reported effects remain as stated: Minor – Not Significant on Residents/Visitors.
	Cumulative Effects:		
	The addition of the Proposed Development will result in Minor and Not Significant cumulative effects. No additional <i>total</i> cumulative effects are predicted.	As illustrated in wireframe in Figure FEI 12e, the Proposed Development will be seen, beyond, and in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen to extend the combined array across the horizon to the east adding further development to the view.	<i>Additional Effect:</i> Minor and Not Significant. <i>Total Effect:</i> Moderate and Not Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 7, Minor road to the north	The Proposed Development will give rise to a Minor	As illustrated in wireframe in Figure FEI 13b, Turbine 3 will reduce in height, very slightly reducing the	The reported effects remain as stated: Minor – Not Significant

of Slamannan	– Not Significant effect on Residents.	influence of the Proposed Development.	on Residents.
Cumulative Effects:			
	The <i>addition</i> of the Proposed Development will result in Moderate/Minor and Not Significant cumulative effects. No additional <i>total</i> cumulative effects are predicted.	As illustrated in wireframe in Figure FEI 13b, the Proposed Development will be seen, beyond, and in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. There will be a slight increase in the density of the combined array.	<i>Additional Effect:</i> Moderate/Minor and Not Significant. <i>Total Effect:</i> Moderate and Not Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 8, Polkemmet Country Park	The Proposed Development will give rise to a Minor – Not Significant effect on Visitors.	As illustrated in the wireframe in Figure FEI 14b, Turbine 3 will reduce in height. The nacelle of the turbine will be lower, appearing at a similar height to the turbines to the north. This effect increases the cohesion of the overall array.	The reported effects remain as stated: Minor – Not Significant on Visitors.
Cumulative Effects:			
	The <i>addition</i> of the Proposed Development will result in Moderate/Minor and Not Significant cumulative effects. No additional <i>total</i> cumulative effects are predicted.	As illustrated in wireframe in Figure FEI 14b, the Proposed Development will be seen in combined views with Burnhead and Drumduff beyond the existing foreground turbines at Torrance Farm and Southrigg. The planning stage site at Heights Wind Farm will be seen to increase the horizontal extent of the combined array on the horizon to the south, increasing visible extent of wind farm development.	<i>Additional Effect:</i> Moderate/Minor and Not Significant. <i>Total Effect:</i> Moderate and Not Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 9, Hillend Reservoir, Caldercruix	The Proposed Development will give rise to a Minor – Not Significant effect on Visitors.	As illustrated in wireframe in Figure FEI 15b, Turbine 3 will reduce in height, very slightly reducing the influence of the Proposed Development.	The reported effects remain as stated: Minor – Not Significant on Visitors.
Cumulative Effects:			
	The <i>addition</i> of the Proposed Development will result in Minor and Not Significant cumulative effects. No additional <i>total</i> cumulative effects are predicted.	As illustrated in wireframe in Figure FEI 15b, the Proposed Development will be seen in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. Heights Wind Farm will increase the apparent density of the combined array.	<i>Additional Effect:</i> Minor and Not Significant. <i>Total Effect:</i> Moderate/Minor and Not Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 10, Henge and Cairn at Cairnpapple	The Proposed Development will give rise to a Moderate/Minor –	As illustrated in wireframe in Figure FEI 16b, Turbine 3 will reduce in height, very slightly reducing the influence of the Proposed	The reported effects remain as stated: Moderate/Minor – Not Significant on

Hill	Not Significant effect on Walkers/Visitors	Development.	Walkers/Visitors.
	Cumulative Effects:		
	The <i>addition</i> of the Proposed Development will result in Moderate and Not Significant cumulative effects. Major/Moderate and Significant <i>total</i> cumulative effects are predicted in the context of the consented but not built footprint of development alongside the Dewshill Planning stage site.	As illustrated in wireframe in Figure FEI 16c, the Proposed Development will be seen in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen in the foreground of the Proposed Development, increasing the apparent density of the combined array.	<i>Additional Effect:</i> Moderate and Not Significant. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects of the consented but not built footprint of development alongside the Dewshill and Heights Wind Farm planning stage sites.
Viewpoint 11, Wallace's Bed	The Proposed Development will give rise to a Moderate/Minor – Not Significant on Walkers/Visitors.	As illustrated in wireframe in Figure FEI 17b, Turbine 3 will reduce in height, very slightly reducing the influence of the Proposed Development.	The reported effects remain as stated: Moderate/Minor – Not Significant on Walkers/Visitors.
	Cumulative Effects:		
	The <i>addition</i> of the Proposed Development will result in Moderate and Not Significant cumulative effects. Major/Moderate and Significant <i>total</i> cumulative effects are predicted in the context of the consented but not built footprint of development alongside the Dewshill Planning stage site.	As illustrated in wireframe in Figure FEI 17b, the Proposed Development will be seen in combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen in the foreground of the Proposed Development, increasing the apparent density of the combined array, and drawing development closer to the viewpoint.	<i>Additional Effect:</i> Moderate and Not Significant. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects of the consented but not built footprint of development alongside the Dewshill and Heights Wind Farm planning stage sites.
Viewpoint 12, West Cairn Hill, Pentland Hills	The Proposed Development will give rise to a Minor – Not Significant effect on Walkers.	As illustrated in wireframe in Figure FEI 18b, Turbine 3 will reduce in height, very slightly reducing the influence of the Proposed Development.	The reported effects remain as stated: Minor – Not Significant on Walkers.
	Cumulative Effects:		
	The <i>addition</i> of the	As illustrated in wireframe in Figure	<i>Additional Effect:</i>

	Proposed Development will result in Minor and Not Significant cumulative effects. Major/Moderate and Significant <i>total</i> cumulative effects are predicted in the context of the consented but not built footprint of development alongside the Camilty planning stage site.	FEI 18b, the Proposed Development will be seen in distant combined views with Burnhead and Drumduff and the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen to slightly increase the apparent density of the combined array.	Minor and Not Significant. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects of the consented but not built footprint of development alongside the Camilty planning stage site.
Viewpoint 13, Matthews Crofts	The Proposed Development will give rise to Major and Significant local effects on Residents who are of High sensitivity. Effects reduce to Moderate and Not Significant in the long term.	As illustrated in Figure FEI 19d, Turbine 3 will reduce in height, reducing the influence of the eastern edge of the array, giving the impression that the turbine is set slightly further back, rounding off the eastern extent of the array.	The change in the height of T3 will slightly reduce visibility from this northern edge of settlement at Blackridge. Overall, the reported effects remain as stated: Major and Significant effects on Residents.
	Cumulative Effects:		
	The <i>addition</i> of the Proposed Development will result in Moderate and Not Significant cumulative effects. No additional <i>total</i> cumulative effects of built consented and planning stage sites are predicted.	As illustrated in Figure FEI 19e, The Proposed Development will be seen in direct combined views with the planning stage site at Heights Wind Farm. Heights Wind Farm will be seen to the east of the Proposed Development and will appear as part of the same extent wind farm. The horizontal extent of the visible wind farm development will be increased however, the establishing tree belts will partly filter direct views to turbines of Heights Wind Farm. The apparent density and the extent of overlapping and discordant turbines will increase. This will increase the magnitude of cumulative change.	<i>Additional Effect:</i> Moderate, Not Significant. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
Viewpoint 14, Knowhead Farm, Blairmuckhill Road	The Proposed Development will give rise to a Moderate/Minor – Not Significant effect on Walkers	As illustrated in the wireframe in Figure FEI 20b, Turbine 3 will reduce in height. The nacelle of the turbine will be lower, appearing at a similar height to the turbines to the north. This effect increases the cohesion of the overall array.	The reported effects remain as stated: Moderate/Minor – Not Significant on Walkers.
	Cumulative Effects:		

	The addition of the Proposed Development will result in Moderate/Minor and Not Significant cumulative effects. Moderate and Not Significant <i>total</i> cumulative effects are predicted in the context of the consented but not built footprint of development alongside the Dewshill Planning stage site.	As illustrated in wireframe in Figure FEI 20b, the Proposed Development will be seen in combined views with Burnhead and Drumduff. The planning stage site at Heights Wind Farm will be seen to increase the horizontal extent of the combined array on the horizon to the east, increasing visible extent of wind farm development.	<i>Additional Effect:</i> Moderate/Minor and Not Significant. <i>Total Effect:</i> Major/Moderate and Significant cumulative effects due to combined effects with Heights Wind Farm planning stage site.
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As discussed in the introduction, WLC have requested that “an additional wireline and photomontage...from the B718 (Harthill Road).” The viewpoint was included as assessment viewpoint VP03 in Heights Wind Farm Planning Application (0434/FUL/23). The viewpoint is assessed in Table 6 below. The effects from this viewpoint are illustrated in Figures 21a-e.

Table 6: Operational Effects on Viewpoint 15, Harthill Road, Blackridge

Viewpoint 15, Harthill Road, Blackridge, Figures 21 a-e	
Distance to the Proposed Development	2.27km
LCT and Designations	273: Lowland Plateaux - Lothians
Receptors and Sensitivity to Change	Residents – High Road Users - Medium
Theoretical visibility	Three turbines to upper tower, hubs and blades.
Location and Rationale for Selection	
<p>The viewpoint is located on Harthill Road in Blackridge. It represents the potential effects on residents and road users.</p> <p>The following wind farm development currently influences the existing baseline as illustrated in the existing view and wireframe in Figure 21b:</p> <ul style="list-style-type: none"> Burnhead and Drumduff Wind Farms are seen on the ridgeline to the north. 	
Description of the Existing View	
<p>The existing framed view looks north along Harthill Road which slopes slightly downhill towards the centre of Blackridge. The street is lined by short terraces of bungalows. The low roofline reveals open views to the north towards the ridgeline at Blackridge. The fields of pasture give way to the large tract of woodland and plantation forestry which blanket the ridgeline. The turbine blades of Burnhead/Drumduff span the ridgeline.</p>	
Determination of Visual Sensitivity	
<p>The sensitivity to change associated with the Proposed Development at this location is considered to be High for residents and Medium for road users:</p> <p>Value – High</p> <ul style="list-style-type: none"> This viewpoint is located within the residential are of Blackridge. <p>Susceptibility to Change – High</p> <ul style="list-style-type: none"> Residents are highly likely to be aware of any changes to their existing visual amenity; 	

<ul style="list-style-type: none"> Awareness of views will be medium for road users.
<p>Magnitude of Change</p> <p>The overall magnitude of change on receptors at this viewpoint will be Moderate. The factors which have contributed to this judgement are as follows:</p> <p>Size or Scale</p> <p>The wireframe indicates that all three turbines will be directly visible from this viewpoint to their upper tower, hubs and blades. The wind farm occupies c.14° of the available 360° panoramic view. Burnhead/Drumduff Wind Farms are seen immediately beyond, and to the left of the Proposed Development comprising an extensive footprint of development upon the plateau visible to turbine blades only.</p> <p>The turbines will be visible on the ridgeline, within and beyond the low forested plateau moorland. The turbines will add further turbines in the context of the existing footprint of development at Burnhead/Drumduff.</p> <p>Geographical Extent</p> <p>The turbines will be seen in the foreground of Burnhead/Drumduff Wind Farms and will appear as noticeable new elements forming part of a single large wind farm.</p> <p>The Proposed Development will lie to the north east at 347° to the viewpoint. It will be seen over a short separation distance of 2.27km to the nearest turbine. The change in view will occur within the northern aspect of the view.</p>
<p>Potential for Future Cumulative Effects</p> <p>The <i>addition</i> of the Proposed Development will result in combined cumulative effects with the baseline of the built sites. The turbines of the Proposed Development will add large new turbines in the context of the existing footprint of development, resulting in a Moderate, Not Significant cumulative effect.</p> <p>The <i>total</i> cumulative effect of built/consented/planning stage sites will result in a Major/Moderate and Significant combined cumulative effect when seen in the context of the built/consented but footprint of development alongside Heights Wind Farm planning stage site. Heights Wind Farm will be seen to the right of the Proposed Development and will appear, albeit larger, as part of the same extended wind farm. The horizontal extent of the visible wind farm development will be increased, and the turbines appear closer and larger.</p>
<p>Significance of Effect</p> <p>The combination of the individual judgements of High sensitivity and a locally Moderate magnitude of change are considered to result in a Major/Moderate effect on Residents and a Moderate effect on Road Users which in the context of this assessment are considered to be Significant and Not Significant effects respectively.</p>

4.2.6 Summary

A truncated update to the LVIA was undertaken for the adjustment to the Proposed Development, the reduction of T3 to a maximum tip height of 135m. The assessment is focussed on landscape and visual receptors where a significant residual effect was reported in the EIAR. Furthermore, a summary update to the assessment of effects at the EIAR viewpoints is set out in this EIA Addendum to enable the effects of the revised Proposed Development to be understood, alongside a parallel update to the cumulative assessment of effects in the context of Heights Wind Farm planning stage site. In addition, a further viewpoint is included from Harthill Road in Blackridge to correspond to the equivalent viewpoint which was included with the Heights Wind Farm application.

The reduction in the height of T3 will improve wind farm composition in views from East Craigs Hill and lead to reduced visibility of the Proposed Development turbine from;

- the northern edge of the Blackridge settlement;

- Blawhorn Moss; and
- north of the Beechbrae Woodland Centre.

A number of limited significant residual cumulative effects are predicted including significant landscape effects on the landscape character of the site and its surroundings, and significant visual effects on local viewpoints.

The large-scale open plateau with forestry and wind farm landscape is considered to have attributes which are suited to further wind farm development. The Proposed Development is focussed away from the main body of the settlement at Blackridge to the south.

Whilst the effects will be significant locally to the Proposed Development Site, and for some visual local receptors, it is considered that these can be accommodated within the wider landscape.

4.2.7 References

Landscape Institute/IEMA (2013). Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3). London: Routledge.

4.3 Cultural Heritage

4.3.1 Introduction

Background

Following consultation responses from West Lothian Council (WLC), statutory consultees (as outlined in Section 3, Table 2 of this FEI Report) and subsequent meetings with the Applicant, WLC requested an updated assessment of additional recommended wirelines and consideration of cumulative effects on cultural heritage assets in line with those presented as part of the planning application for the neighbouring proposed development known as 'Heights Wind Farm' (0434/FUL/23).

Historic Environment Scotland (HES) and West Lothian Council's Case Officer recommended assessment of wirelines from Woodend Farm, Farmstead 1400m WSW Of (Asset 24, SM 11222) and Craigmarr, Farmstead 720m WNW Of (Asset 13, SM 11223) in order to understand the relationships between the two assets, their settings and any potential impacts that the Proposed Development would have on them. Additional wirelines have been produced for these two assets (FEI Figures 22 and 23) and include the latest update from the Proposed Development which factors in the reduction in tip height of Turbine 3.

The assessment of effects set out in the Cultural Heritage chapter of the EIA Report supplements the information contained within this FEI Report.

4.3.2 Methodology

In the EIA Report, the criteria for assessing sensitivity of Heritage Assets methodology, as described in Chapter 10, Section 10.2.4 is used for the assessment of effects relating to heritage assets (Assets 13 & 24) in this Report.

Heritage assets have value in the sense that they “...create spaces for recreation, leisure, tourism, and education, or places for nature to thrive” and “can be a source of identity, a resource for learning, or a spark for creativity” (HES, 2023).

All heritage assets have significance; however, some heritage assets are judged to be more important than others. The level of that importance is, from a cultural resource management perspective, determined by establishing the asset's capacity to contribute to our understanding or appreciation of the past (HES, 2019). In the case of many heritage assets their importance has already been established through the designation (i.e. Scheduling, Listing and Inventory) processes applied by HES. The rating of importance of heritage assets is first and foremost made in reference to their designation. For non-designated assets importance is assigned based on professional judgement and guided by the criteria presented in Table 10.3 of Chapter 10 in the EIA Report; which itself relates to the criteria for designations as set out in Designation Policy and Selection Guidance (HES, 2020a) and Scotland's Listed Buildings (HES, 2020b).

4.3.3 Supporting Graphics

This update to the Cultural Heritage assets has been informed by the figures listed below and included in Volume 2 of this FEI Report.

- Figure FEI 22: Viewpoint CH1: Woodend Farmstead, SAM
- Figure FEI 23: Viewpoint CH2: Craigmarray Farmstead, SAM

4.3.4 Updated Assessment of Effects

Woodend Farm, farmstead 1400m WSW of (Asset 24, Scheduled Monument, SM11222)

Woodend Farm is a farmstead of post-medieval date visible as an upstanding monument. The remains of the farmstead are comprised of the foundations of three buildings and two enclosures.

As a farmhouse the elements of its settings which contribute to an ability to understand and appreciate its value relate to the inter-relationship between the house and its adjacent farm buildings and the immediately proximate agricultural fields, moorlands and communication routes which it would have been sited to exploit. While sensitive to changes which would affect these relationships, the farmhouse is judged to be of Low sensitivity to changes in the wider landscape.

ZTV analysis indicates that all three turbines would be visible from Woodend Farm at a distance of 1.49km to the west. The wireline Figure FEI Figure 22 confirms this level of visibility with all three turbines visible; one to hub height with the blade of two turbines visible from Woodend Farm.

Woodend Farms's relationship with the agricultural land and moorland in its vicinity would not be disrupted by the Proposed Development. Although the Proposed Development is situated at 1.49km to the west it is still possible to understand, appreciate and experience the setting of Woodend Farm in relation to the moorland in its immediate vicinity and further west towards the Proposed Development; this relationship remains legible. Therefore, it is considered that the Proposed Development would not affect an ability to understand, appreciate or experience this monument and the integrity of its setting would not be adversely affected. For these reasons the

magnitude of impact upon the setting of this asset is predicted to be medium, and given its low sensitivity, it is considered that the resulting effect on Woodend Farm farmstead would be **minor adverse** and not significant.

Craigmarry, farmstead 720m WNW of (Asset 13, Scheduled Monument, SM1223)

Craigmarry is a farmstead of post-medieval date situated on a slight elevation. The remains of the farmstead are comprised of the foundations of a single building with three compartments. Two enclosures are attached to the farmstead.

As a farmhouse the elements of its settings which contribute to an ability to understand and appreciate its value relate to the inter-relationship between the house and its adjacent farm buildings and the immediately proximate agricultural fields, moorlands and communication routes which it would have been sited to exploit. While sensitive to changes which would affect these relationships, the farmhouse is judged to be of Low sensitivity to changes in the wider landscape.

ZTV analysis indicates that all three turbines would be visible from Craigmarry at a distance of 2.28km to the southwest. The wireline Figure FEI Figure 23 confirms this level of visibility with all three turbines visible to hub height from Craigmarry.

Craigmarry's relationship with the agricultural land and moorland in its vicinity would not be disrupted by the Proposed Development. Given the distance of 2.28km to the Proposed Development the Proposed Development would also not affect an ability to understand, appreciate and experience the setting of Craigmarry in relation to the moorland to its southwest towards the Proposed Development; this relationship remains legible. Therefore, it is considered that the Proposed Development would not affect an ability to understand, appreciate or experience this monument. For these reasons the magnitude of impact upon the setting of this asset is predicted to be medium, and given its low sensitivity, it is considered that the resulting effect on Craigmarry farmstead would be **minor adverse** and not significant. There would be no significant impact upon the integrity of the asset's setting.

4.3.5 Updated Cumulative Assessment

Cumulative impacts have been considered for those assets where the impact upon setting from the Proposed Development alone has been judged to be of minor level or greater. The cumulative assessment of assets for this section of the FEI Report is limited to any assets raised in consultation with HES, WoSAS and West Lothian Council Case Officer where the impact upon setting from the Proposed Development alone has been judged to be of minor level or greater.

Woodend Farm, farmstead 1400m WSW of (Asset 24, Scheduled Monument, SM11222)

As viewed from Woodend Farm farmstead all three turbines of the Proposed Development would be visible; two to hub height with the blade of one turbine visible from Woodend Farm. (FEI Figure 22). The turbines would feature low on the horizon to the left of the existing windfarm of Easter Glentore.

The three turbines of Heights Wind Farm is currently in the planning process and would feature prominently in front of Turbine 3 of the Proposed Development. Heights Wind

Farm would be more prominent in relation to the Proposed Development and therefore this would reduce the overall effect of the Proposed Development on Craigmarr.

Should the turbines of Heights Wind Farm be consented then in AOC Archaeology Group's professional opinion the cumulative effect of including the Proposed Development in this baseline will be **negligible adverse**. There would be no significant adverse impact upon the integrity of the asset's setting.

Craigmarr, farmstead 720m WNW of (Asset 13, Scheduled Monument, SM1223)

As viewed from Craigmarr farmstead all three turbines of the Proposed Development would be visible to hub height (FEI Figure 23). The turbines would partially infill a gap between the existing wind farm of Drumduff to the right and Forrestfield which has been approved or is under construction.

The three turbines of Heights Wind Farm are currently in the planning process and would feature prominently in front of other wind farms and the Proposed Development. This would reduce the overall effect of the Proposed Development on Craigmarr farmstead.

Should the turbines of Heights Wind Farm be consented then in AOC Archaeology Group's professional opinion the cumulative effect of including the Proposed Development in this baseline will be **negligible adverse**. There would be no significant adverse impact upon the integrity of the asset's setting.

4.3.6 Summary

An update to the assessment of cultural heritage assets in Chapter 10 of the EIA Report was undertaken for the adjustment to the Proposed Development the reduction T3 to a maximum tip height of 135m and at additional wirelines to include Assets 24 – Woodend Farmstead, and 13 – Craigmarr Farmstead.

No residual or cumulative significant effects are predicted on either of these assets, nor would there be significant adverse impact upon the integrity of their setting.

4.3.7 References

HES (2019) Historic Environment Policy for Scotland. Edinburgh: Historic Environment Scotland.

HES (2020a) Designation Policy and Selection Guidance. Historic Environment Scotland. Published 05 April 2019. Updated 04 December 2020.

HES (2020b) Managing Change in the Historic Environment: Setting. Edinburgh: Historic Environment Scotland. Published 01 June 2016. Updated 03 February 2020.

HES (2023) Our Place, Our Future. The Historic Environment Strategy for Scotland's Historic Environment [Online]. Available at:
<https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=79204155-9eb2-4d29-ab14-aff200ec2801>

4.4 Noise

4.4.1 Background

Following consultation with West Lothian Council's Environmental Health Department (Section 3, Table 2 of this Report), consideration of a cumulative assessment with Heights Wind Farm (0434/FUL/23) was requested.

Further to this, the noise assessment in this section has been progressed to include the reduced tip height of turbine 3 in line with the latest updates to the Proposed Development description as described in Section 2.2 of this FEI Report.

4.4.2 Introduction

This chapter considers the potential noise impacts arising from construction and operation of the Proposed Development, in the context of the existing Drumduff windfarm and that at Burnhead, on noise sensitive receptor locations in the vicinity. Noise sensitive receptor locations in this case are inhabited residential properties. The chapter has been updated to include assessment of the additional effect of the proposed Heights Wind Farm development and a reduction in height and a change of turbine type for T3.

Noise during the construction phase of the development will arise from construction vehicles accessing the Proposed Development site and from construction activities within it, including track construction and turbine erection. Noise during the operational phase of the development will arise from the installed wind turbines as they rotate to generate energy.

Construction noise impacts have been assessed with regard to in relevant guidance *BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites*. There may also be temporary impacts associated with construction traffic assessing the site which have been considered in the assessment.

Operational wind turbine noise impacts have been assessed in line with ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, and the associated guidance provided by the Institute of Acoustics (IOA) document, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*.

The noise assessment has been undertaken by the Hayes McKenzie Partnership Ltd. The lead author is Andy McKenzie (PhD, BSc, FIOA), a director at Hayes McKenzie, who has worked in the field of acoustical engineering for around 40 years. In that time, Andy has specialised in the field of noise from onshore wind farms and has been involved in work on over 500 wind farm projects, also appearing as an expert witness (relating to wind farm noise) in the UK and Ireland. Hayes McKenzie Partnership Ltd are sponsor members of the Institute of Acoustics (IOA) and members of the Association of Noise Consultants (ANC).

4.5 Methodology and Approach

4.5.1 Legislation, planning policy and guidance

This section sets out the relevant policy and guidelines that have been taken into consideration in the preparation of the noise assessment.

Planning Policy

The following planning policy has informed the noise assessment methodology:

- Planning Advice Note PAN1/2011, Planning and Noise
- Scottish Government 2014, Web Based Planning Advice, Onshore Wind Turbines
- The Scottish Government's Technical Advice Note, Assessment of Noise
- Scottish Government On-Shore Wind Policy Statement 2022

Guidance

Recognition has been taken of the following best practice guidelines/guidance etc:

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise

ETSU-R-97 The Assessment and Rating of Noise from Wind Farms

Institute of Acoustics (IOA), A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

4.5.2 Assessment Methodology

Construction

Noise from construction has been assessed by carrying out noise predictions for typical plant involved with track construction and for the creation of the turbine foundations and their erection. The results have been compared oared with the limits in BS 5228, Code of Practice for Noise and Vibration Control on Construction and Open Sites which provides example criteria for the assessment of the significance of construction noise effects and a method for the prediction of noise levels from construction activities. The relevant noise limits for construction activities continuing for more than one month are 45, 55 and 65 dB L_{Aeq} , for night-time (2300-0700), evening and weekends, and daytime (0700-1900) including Saturdays (0700-1300) respectively. These are the limits against which noise from construction activities are assessed. Noise from construction activities will be controlled and minimised through a construction and environmental management plan (CEMP) that will be prepared at the time of construction.

It is intended that construction traffic will pass through the village of Blackridge and on to the Proposed Development Site from the south. A new track will be constructed as shown in Chapter 9 of the EIA Report to access the turbine locations.

Operation

The approach to assessing operational noise effects has been carried out in line with the recommendations of ETSU-R-97 The Assessment and Rating of Noise from Wind Farms (ETSU-R-97) and the Institute of Acoustics, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IOA GPG) as referred to in National Planning policy identified above.

ETSU-R-97 recommends that, although noise limits should be set relative to existing background and should reflect the variation of both turbine and background noise with wind speed, this can imply very low noise limits in particularly quiet areas, in which case, *"it is not necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised*

as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour".

For daytime periods (07:00 to 23:00), the noise limit is 35-40 dB L_{A90} or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-40 dB(A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of kWh generated; and the duration and level of exposure. 'Quiet daytime hours' are defined as evenings from 18:00 to 23:00 plus Saturday afternoons from 13:00 to 18:00 and Sundays from 07:00 to 18:00.

For night-time periods (23:00 to 07:00) the noise limit is 43 dB L_{A90} or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is based on an internal sleep disturbance criterion of 35 dB(A) with an allowance of 10 dB(A) for attenuation through an open window and 2 dB(A) subtracted to account for the use of L_{A90} rather than L_{Aeq} .

Where predicted noise levels are low at the nearest residential properties, a simplified noise limit can be applied, such that noise is restricted to the minimum ETSU-R-97 level of 35 dB L_{A90} for wind speeds up to 10 m/s at 10 m height. This removes the need for extensive background noise measurements for smaller or more remote schemes.

It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period 't'. It is often used as a description of the average ambient noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.

ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed the threshold of audibility.

With regard to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative effect of all wind turbines in the area contributing to the noise received at affected properties. Existing wind farms are included in cumulative predictions of noise level not considered as part of the prevailing background noise.

In this case, the cumulative effect will consist of that from the Proposed Development, from the existing Drumduff site and from the existing Burnhead site plus that from the proposed Heights Wind Farm development. For the purposes of this assessment, it has been assumed that the Proposed Development will be under the control of the same operator as the existing site and can be consented subject to planning conditions (on noise) covering the two sites acting together.

The limits applicable to all wind farm noise (the Overall Noise Budget - ONB) at affected properties, shown on Figure 1, are, with the exception of properties in Blackridge, set out in Chapter 11 of the ES submitted as part of the planning application for Burnhead wind farm and applied to Burnhead via its planning conditions on noise. Although, in theory, Burnhead is entitled to emit noise up to this level, this is not physically possible in practice for all properties, wind speeds and wind directions. The Remaining Noise Budget (RNB) available to the combined effect of the Proposed Development, acting alongside the existing Drumduff Wind Farm site, and the Heights Wind Farm

development, can be calculated by subtracting, logarithmically using dB subtraction, the predicted level of noise from Burnhead, at each wind speed, from the ONB applicable at each property at each wind speed. There are occasions where this is done for different wind sectors, but this is not necessary here because of the geographical relationship between the two sites and the affected properties.

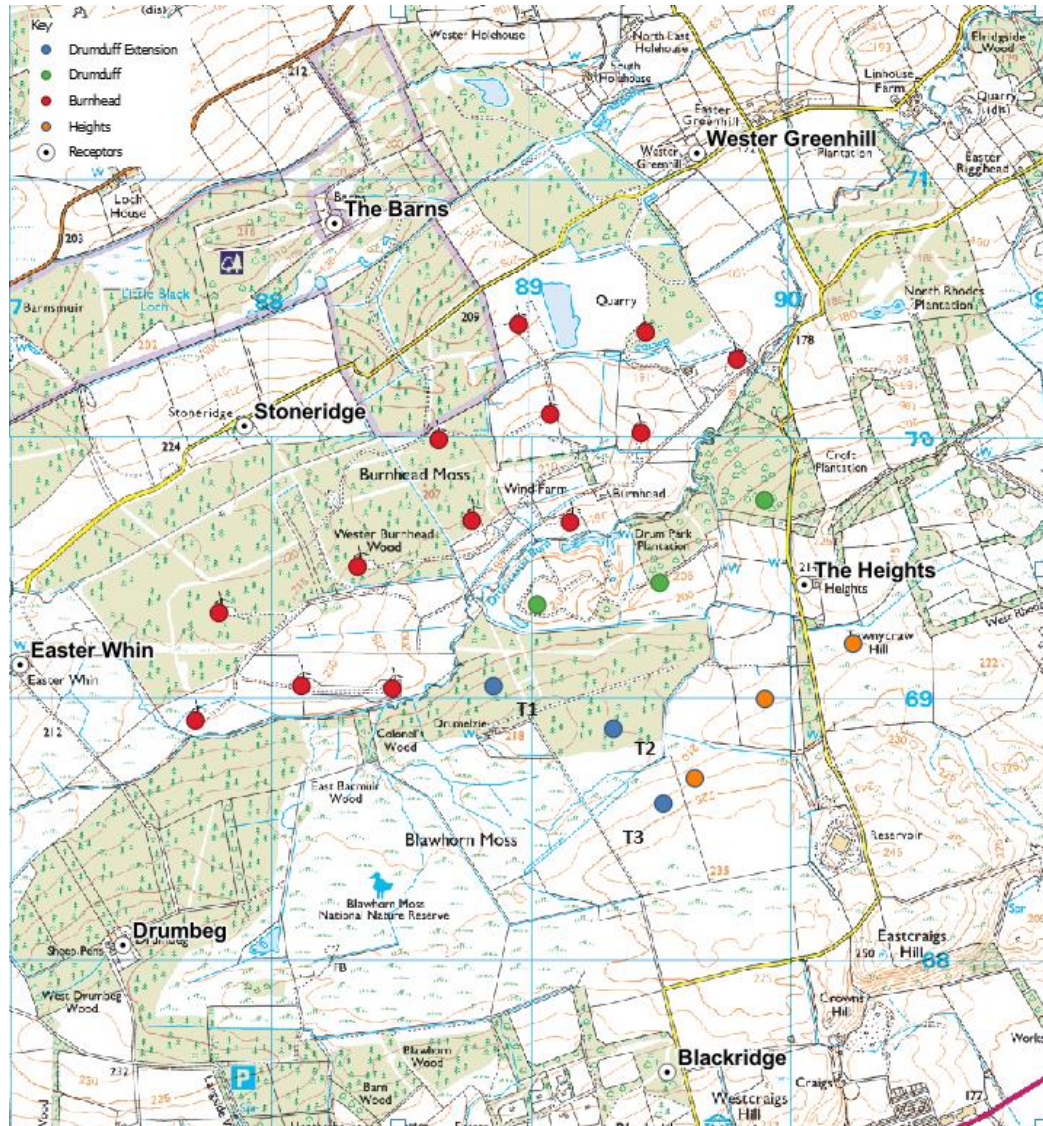


Figure 1: Turbine and Receptor Locations

* The Heights property is understood to have been taken out of residential use and is not considered any further in this assessment.

The closest residential property in Blackridge has been assumed to be that covered by planning application 1142/FUL/22, Land South of Beechbrae Woodland Centre, which was recently consented.

At the properties to the north, noise from the Proposed Development will, however, be minimal in comparison to that from the existing turbines, particularly those at Burnhead.

Leaving aside the proposed Heights Wind Farm development, initially, the first stage in this assessment is to establish how much increase in noise the Proposed Development would cause over and above that from existing consented development (not including the consented Drumelzie turbine, which would not be built if the Proposed Development were to go ahead).

The Remaining Noise Budget approach is then used to assess the noise from the combined effect of the Proposed Development, and the existing Drumduff site operating together, at locations where the Proposed Development is predicted to cause an increase of more than 0.5 dB over and above that from the existing Drumduff site acting alongside Burnhead.

This approach is then repeated but including the Proposed Heights Wind Farm Development in with the Proposed Development, first establishing the increase in noise the two proposed sites would cause over and above that from the existing consented development. As before, the RNB approach is then used to assess the noise from the combined effect of the Proposed Development, Proposed Heights Wind Farm Development and existing Drumduff site operating together.

It should be noted that, for the purposes of this assessment, the lower limiting value of 35 dB L_{A90} , at the bottom end of the permitted range of 35 – 40, has been utilised in setting the daytime ONB.

4.5.3 Significance Criteria

If the relevant noise limits, identified above, are met then the construction and operational noise impact for the purposes of this assessment are considered to be not significant.

4.5.4 Baseline Conditions

No specific baseline measurements or assessment has been carried out to inform this assessment. Instead, the noise limits covering all wind farm noise in the area have been taken from the measurements and assessment carried out for the existing Burnhead wind farm.

No measurements were carried out to represent the village of Blackridge, and in particular the closest properties therein, so the baseline noise levels, and hence the limits, derived for Drumbeg have been used as worst case (i.e. lower noise limits) to be representative of these which are much more affected by noise from the A89 which passes through it. This has been agreed with West Lothian council.

4.5.5 Assessment of Effects and Mitigation

Construction Effects

On Site Construction Work

Construction noise predictions have been carried out specifically for the track works which, at its closest location to any residential property (in this case the closest property in Blackridge), will be where the proposed access track joins Heights Road. The construction noise predictions have been carried out in line with the methodology contained in BS5228 assuming the track construction plant in Table 7 which also identifies the sound power level (L_{WA}) for each item of plant, as taken from Annex C of the standard.

In carrying out the predictions it has been assumed that all plant involved with track construction is located at the nearest possible point to the property. It should be noted that this is unlikely to occur in practice and the plant will gradually move away from the

property as the work progresses. For the calculations, 50% soft ground attenuation has been used throughout with no topographical barrier attenuation.

Table 7: Construction Noise Assumptions

Plant Item	No.	BS5228 Ref	L _{WA} (dBA)
Dozer 104 kW	1	C.5_12	104.7
Wheeled Backhoe Loader 62KW	1	C.2_8	95.9
Tracked Excavator 27kW	1	C.5_35	102.7
Dump Truck 66KW	1	C.9_16	118.5
Road Roller	1	C.5_19	107.7

The predicted noise level at this closest point is 58 dB L_{Aeq} which is below the 65 dB L_{Aeq} limit.

Access Traffic

HGV traffic accessing the site is shown in Chapter 9 to be 64 two way movements per day. This traffic will leave the A89 in Blackridge and turn into Heights Road to access the newly constructed track to the site. It will therefore pass the closest properties in Heights Road at a minimum distance of approximately 5 metres. Predictions of HGV noise have been carried out as described in BS5228 assuming an HGV sound power level of 107 dB (from BS5228 ref C.11_7) and a speed of 30 miles per hour. The predicted noise level at these closest properties is 57 dB L_{Aeq} during this peak period of activity which is below the 65 dB L_{Aeq} limit.

Operational Effects

Operational noise predictions have been carried out in line with the methodology set out in the Institute of Acoustics (IOA), *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IOA GPG). The full details of the prediction methodology are set out in Appendix 11.1, but the main assumptions are described below.

- o Receiver height of 4 m;
- o Ground effect ground coefficient G=0.5;
- o Atmospheric attenuation corresponding to a temperature of 10°C and a relative humidity of 70%;
- o Topographical barriers and concave ground profile corrections have been applied according to the IOA GPG;
- o A margin of plus 2 dB has been added to manufacturer's sound power level data to account for any uncertainty.

The source noise levels for the candidate Vestas V136 4.5 MW turbine (T1 and T2) and Vestas V117 3.45MW turbine (T3) with STEs assumed for the Proposed Development, with a hub height of 81.9 metres and 76.5 metres respectively, are set out in Table 8 alongside those for the existing Drumduff and Burnhead turbines and proposed Heights Wind Farm turbines.

Table 8: Turbine Sound Power Levels

Wind Farm	Turbine Type	Standardised 10m Height Wind Speed (m/s)									
		4	5	6	7	8	9	10	11	12	
Drumduff Extension	Vestas V136	100.6	105.2	108.7	108.9	108.9	108.9	108.9	108.9	108.9	
Drumduff Extension	Vestas V117	97.6	102.1	106.2	108.6	108.8	108.8	108.8	108.8	108.8	
Drumduff Existing	GE100	94.8	98.7	103.8	107.0	107.0	107.0	107.0	107.0	107.0	
Burnhead	Vestas V90	96.4	101.4	104.5	105.6	106.0	106.0	106.0	106.0	106.0	
Heights	SG155	99.8	104.6	107.0	107.0	107.0	107.0	107.0	107.0	107.0	

The octave band noise data taken from manufacturers' technical specification document are set out at Table 9 below. These octave band levels have been normalised to the overall sound power level at each integer wind speed presented at Table 8 above.

Table 9: Turbine Octave Sound Power Levels (dB LWAEq)

Wind Farm	Turbine Type	Octave Band								
		63	125	250	500	1000	2000	4000	8000	Overall
Drumduff Extension	Vestas V136	87.5	94.9	100.1	102.9	103.4	101.7	97.6	91.3	108.9
Drumduff Extension	Vestas V117	93.9	98.9	100.3	101.5	102.7	101.6	98.3	89.0	108.8
Drumduff Existing	GE100	92.3	96.5	96.6	97.8	102.3	101.6	92.7	73.9	107.0
Burnhead	Vestas V90	90.6	95.9	98.2	99.5	99.4	98.5	95.4	81.4	106.0
Heights	SG155	86.6	94.0	98.6	100.9	100.7	101.0	94.4	79.4	107.0

Operational noise prediction results are presented for the Proposed Development acting alone, for the combined effect of the Proposed Development and the existing Drumduff site, for the existing Drumduff and Burnhead sites only, and for all three acting together in Table 10, Table 11 Table 12 and Table 13 for the properties identified on Figure 1.

These predictions assume that each receptor location is downwind of all developments simultaneously as a worst case.

Table 10: Noise Prediction Results – Proposed Development Alone

Receptor	Standardised 10m Height Wind Speed (m/s)									
	4	5	6	7	8	9	10	11	12	
The Barns	20.6	25.2	28.8	29.4	29.4	29.4	29.4	29.4	29.4	
Wester Greenhill	19.7	24.2	27.9	28.6	28.6	28.6	28.6	28.6	28.6	
Drumbeg	21.7	26.3	30.0	30.6	30.6	30.6	30.6	30.6	30.6	
Easter Whin	20.7	25.3	28.9	29.5	29.5	29.5	29.5	29.5	29.5	
Stoneridge	23.7	28.3	31.9	32.4	32.4	32.4	32.4	32.4	32.4	
Blackridge – Closest	26.2	30.8	34.6	35.9	35.9	35.9	35.9	35.9	35.9	

Table 11: Noise Prediction Results – Proposed Development plus Drumduff Existing

Receptor	Standardised 10m Height Wind Speed (m/s)									
	4	5	6	7	8	9	10	11	12	
The Barns	22.4	26.7	30.7	32.6	32.6	32.6	32.5	32.4	32.4	
Wester Greenhill	23.4	27.4	31.9	34.3	34.5	34.4	34.3	34.3	34.3	

Receptor	Standardised 10m Height Wind Speed (m/s)									
	4	5	6	7	8	9	10	11	12	
Drumbeg	22.4	26.9	30.8	32.0	32.1	32.0	31.9	31.9	31.9	
Easter Whin	21.7	26.1	30.0	31.3	31.4	31.3	31.2	31.2	31.2	
Stoneridge	25.0	29.4	33.3	34.9	34.9	34.9	34.8	34.8	34.8	
Blackridge – Closest	26.7	31.2	35.1	36.7	36.7	36.7	36.6	36.6	36.6	

Table 12: Noise Prediction Results – Drumduff Existing and Burnhead

Receptor	Standardised 10m Height Wind Speed (m/s)								
	4	5	6	7	8	9	10	11	12
The Barns	30.3	35.3	38.5	39.8	40.1	40.1	40.1	40.1	40.1
Wester Greenhill	31.0	35.8	39.1	40.5	40.9	40.9	40.9	40.9	40.9
Drumbeg	27.4	32.4	35.6	36.8	37.2	37.2	37.2	37.2	37.2
Easter Whin	29.9	34.9	38.1	39.2	39.6	39.6	39.6	39.6	39.6
Stoneridge	32.8	37.7	40.9	42.2	42.5	42.5	42.5	42.5	42.5
Blackridge – Closest	23.9	28.7	32.1	33.8	34.1	34.1	34.0	34.0	34.0

Table 13: Noise Prediction Results – Proposed Development plus Drumduff Existing and Burnhead

Receptor	Standardised 10m Height Wind Speed (m/s)									
	4	5	6	7	8	9	10	11	12	
The Barns	30.8	35.7	38.9	40.1	40.5	40.5	40.5	40.4	40.4	
Wester Greenhill	31.3	36.1	39.4	40.8	41.2	41.1	41.1	41.1	41.1	
Drumbeg	28.5	33.3	36.6	37.8	38.1	38.0	38.0	38.0	38.0	
Easter Whin	30.4	35.3	38.5	39.7	40.0	40.0	40.0	40.0	40.0	
Stoneridge	33.3	38.2	41.4	42.6	42.9	42.9	42.9	42.9	42.9	
Blackridge – Closest	28.2	32.9	36.6	38.0	38.1	38.1	38.1	38.1	38.1	

Table 14 shows the increase in noise caused by the addition of the Proposed Development to that from the existing Drumduff and Burnhead sites.

Table 14: Increase in Noise caused by the Proposed Development

Receptor	Standardised 10m Height Wind Speed (m/s)								
	4	5	6	7	8	9	10	11	12
The Barns	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Wester Greenhill	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3
Drumbeg	1.0	1.0	1.1	0.9	0.9	0.9	0.9	0.9	0.9
Easter Whin	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Stoneridge	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Blackridge – Closest	4.3	4.2	4.4	4.2	4.0	4.0	4.0	4.0	4.0

The results show that, only Drumbeg and properties in Blackridge are predicted to experience an increase in wind turbine noise level over 0.5 dB caused by the introduction of the Proposed Development.

The Overall Noise Budget for Drumbeg and the closest residential property in Blackridge, represented by the ONB for Drumbeg, is shown at Table 15, as taken from the Burnhead ES, together with Remaining Noise Budget for the Proposed Development, acting alongside the existing Drumduff site once the predicted level from Burnhead is subtracted (logarithmically using decibel subtraction).

Table 15: ONB, Predicted Noise from Burnhead and the RNB

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Drumbeg – Day	ONB	35.0	37.0	40.0	43.0	47.0	50.0	52.0	54.0	56.0
	Burnhead	27.2	32.2	35.3	36.4	36.8	36.8	36.8	36.8	36.8
	RNB	34.2	35.3	38.2	41.9	46.6	49.8	51.9	53.9	55.9
Drumbeg – Night	ONB	43.0	43.0	43.0	43.0	44.0	48.0	51.0	53.0	55.0
	Burnhead	27.2	32.2	35.3	36.4	36.8	36.8	36.8	36.8	36.8
	RNB	42.9	42.6	42.2	41.9	43.1	47.7	50.8	52.9	54.9
Blackridge- Closest – Day	ONB	35.0	37.0	40.0	43.0	47.0	50.0	52.0	54.0	56.0
	Burnhead	23.0	28.0	31.1	32.2	32.6	32.6	32.6	32.6	32.6
	RNB	34.7	36.4	39.4	42.6	46.8	49.9	51.9	54.0	56.0
Blackridge- Closest – Night	ONB	43.0	43.0	43.0	43.0	44.0	48.0	51.0	53.0	55.0
	Burnhead	23.0	28.0	31.1	32.2	32.6	32.6	32.6	32.6	32.6
	RNB	43.0	42.9	42.7	42.6	43.7	47.9	50.9	53.0	55.0

Table 16 then shows the predicted noise level for the Proposed Development acting alongside the existing Drumduff site compared to the RNB.

Table 16: Predicted Noise from the Proposed Development plus Existing Drumduff Compared to the RNB

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Drumbeg – Day	Predicted Level	22.4	26.9	30.8	32.0	32.1	32.0	31.9	31.9	31.9
	RNB	34.2	35.3	38.2	41.9	46.6	49.8	51.9	53.9	55.9
	Difference	11.8	8.3	7.4	9.9	14.5	17.8	19.9	22.0	24.0

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Drumbeg – Night	Predicted Level	22.4	26.9	30.8	32.0	32.1	32.0	31.9	31.9	31.9
	RNB	42.9	42.6	42.2	41.9	43.1	47.7	50.8	52.9	54.9
	Difference	20.4	15.7	11.4	9.9	11.0	15.6	18.9	21.0	23.0
Blackridge- Closest – Day	Predicted Level	26.7	31.2	35.1	36.7	36.7	36.7	36.6	36.6	36.6
	RNB	34.7	36.4	39.4	42.6	46.8	49.9	51.9	54.0	56.0
	Difference	8.1	5.2	4.3	6.0	10.2	13.2	15.3	17.3	19.4
Blackridge- Closest – Night	Predicted Level	26.7	31.2	35.1	36.7	36.7	36.7	36.6	36.6	36.6
	RNB	43.0	42.9	42.7	42.6	43.7	47.9	50.9	53.0	55.0
	Difference	16.3	11.7	7.6	6.0	7.0	11.2	14.3	16.3	18.3

It can be seen that the predicted level for the Proposed Development, acting alongside the existing Drumbeg turbines, is well within the Remaining Noise Budget at these two locations and, by inference, at all locations in Blackridge.

Decommissioning Effects

The decommissioning effects have not been assessed in detail as these will be less than the effects of construction which have been shown to be not significant.

Cumulative Effects

Operational noise prediction results are presented for the Proposed Development acting with the Proposed Heights Wind Farm site, for the combined effect of the Proposed Development, Heights Wind Farm and the existing Drumduff site, for the existing Drumduff and Burnhead sites only, and for all four acting together in Table 17, Table 18, Table 19 and Table 20 for the properties identified on Figure 1. Table 19 is the same as Table 12, but has been reproduced here for clarity.

Table 17: Noise Prediction Results – Proposed Development and Heights

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
The Barns		22.6	27.3	30.4	30.9	30.9	30.9	30.9	30.9	30.9
Wester Greenhill		23.0	27.7	30.7	31.1	31.1	31.1	31.1	31.1	31.1
Drumbeg		23.2	27.9	31.2	31.7	31.7	31.7	31.7	31.7	31.7
Easter Whin		22.1	26.8	30.1	30.5	30.5	30.5	30.5	30.5	30.5
Stoneridge		25.1	29.7	33.0	33.4	33.4	33.4	33.4	33.4	33.4
Blackridge – Closest		28.9	33.6	36.8	37.6	37.6	37.6	37.6	37.6	37.6

Table 18: Noise Prediction Results – Proposed Development and Heights, plus Drumduff Existing

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
The Barns		23.8	28.3	31.9	33.3	33.4	33.3	33.2	33.2	33.2
Wester Greenhill		25.1	29.5	33.2	35.2	35.3	35.2	35.1	35.1	35.1
Drumbeg		23.7	28.3	31.8	32.8	32.9	32.8	32.8	32.7	32.7
Easter Whin		22.8	27.4	30.9	32.0	32.1	32.0	32.0	32.0	32.0

Receptor	Standardised 10m Height Wind Speed (m/s)									
	4	5	6	7	8	9	10	11	12	
Stoneridge	26.0	30.5	34.2	35.5	35.5	35.5	35.4	35.4	35.4	
Blackridge – Closest	29.2	33.8	37.1	38.1	38.1	38.1	38.1	38.1	38.1	

Table 19: Noise Prediction Results – Drumduff Existing and Burnhead

Receptor	Standardised 10m Height Wind Speed (m/s)								
	4	5	6	7	8	9	10	11	12
The Barns	30.3	35.3	38.5	39.8	40.1	40.1	40.1	40.1	40.1
Wester Greenhill	31.0	35.8	39.1	40.5	40.9	40.9	40.9	40.9	40.9
Drumbeg	27.4	32.4	35.6	36.8	37.2	37.2	37.2	37.2	37.2
Easter Whin	29.9	34.9	38.1	39.2	39.6	39.6	39.6	39.6	39.6
Stoneridge	32.8	37.7	40.9	42.2	42.5	42.5	42.5	42.5	42.5
Blackridge – Closest	23.9	28.7	32.1	33.8	34.1	34.1	34.0	34.0	34.0

Table 20: Noise Prediction Results – Proposed Development and Heights, plus Drumduff Existing and Burnhead

Receptor	Standardised 10m Height Wind Speed (m/s)								
	4	5	6	7	8	9	10	11	12
The Barns	31.0	35.9	39.1	40.3	40.6	40.6	40.6	40.6	40.6
Wester Greenhill	31.6	36.5	39.7	41.0	41.3	41.3	41.3	41.3	41.3
Drumbeg	28.8	33.7	36.9	38.0	38.3	38.3	38.2	38.2	38.2
Easter Whin	30.6	35.5	38.7	39.8	40.1	40.1	40.1	40.1	40.1
Stoneridge	33.5	38.4	41.6	42.7	43.0	43.0	43.0	43.0	43.0
Blackridge – Closest	30.1	34.8	38.0	39.1	39.2	39.2	39.2	39.2	39.2

Table 21 shows the increase in noise caused by the addition of the Proposed Development and the proposed Heights Wind Farm development to that from the existing Drumduff and Burnhead sites.

Table 21: Increase in Noise caused by the Proposed Development plus Heights

Receptor	Standardised 10m Height Wind Speed (m/s)								
	4	5	6	7	8	9	10	11	12
The Barns	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Wester Greenhill	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4
Drumbeg	1.4	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1
Easter Whin	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Stoneridge	0.7	0.6	0.7	0.5	0.5	0.5	0.5	0.5	0.5
Blackridge – Closest	6.2	6.1	5.9	5.3	5.1	5.1	5.2	5.2	5.2

The results show that, all properties are predicted to experience an increase in wind turbine noise level over 0.5 dB caused by the introduction of the Proposed Development and the Proposed Heights Wind Farm Development. However, at The Barns, Wester Greenhill, Easter Whin and Stoneridge, exceedances of more than 0.5 dB

only occur at low wind speeds (4-6m/s) and are only marginally (up to 0.2 dB) above this criterion. These predictions assume that properties are downwind of all turbines at once, which in practice cannot occur. Therefore, it is considered that the increase caused by the Proposed Development and the Proposed Heights Wind Farm Development is not significant at these properties.

The Overall Noise Budget for Drumbeg and the closest residential property in Blackridge, represented by the ONB for Drumbeg, is shown in Table 22, as taken from the Burnhead ES, together with the Remaining Noise Budget for the Proposed Development acting alongside the existing Drumduff site, together with the Proposed Heights Wind Farm Development once the predicted level from Burnhead is subtracted (logarithmically using decibel subtraction). This is the same as Table 15 but has been reproduced here for clarity.

Table 22: ONB, Predicted Noise from Burnhead and the RNB

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Drumbeg – Day	ONB	35.0	37.0	40.0	43.0	47.0	50.0	52.0	54.0	56.0
	Burnhead	27.2	32.2	35.3	36.4	36.8	36.8	36.8	36.8	36.8
	RNB	34.2	35.3	38.2	41.9	46.6	49.8	51.9	53.9	55.9
Drumbeg – Night	ONB	43.0	43.0	43.0	43.0	44.0	48.0	51.0	53.0	55.0
	Burnhead	27.2	32.2	35.3	36.4	36.8	36.8	36.8	36.8	36.8
	RNB	42.9	42.6	42.2	41.9	43.1	47.7	50.8	52.9	54.9
Blackridge- Closest – Day	ONB	35.0	37.0	40.0	43.0	47.0	50.0	52.0	54.0	56.0
	Burnhead	23.0	28.0	31.1	32.2	32.6	32.6	32.6	32.6	32.6
	RNB	34.7	36.4	39.4	42.6	46.8	49.9	51.9	54.0	56.0
Blackridge- Closest – Night	ONB	43.0	43.0	43.0	43.0	44.0	48.0	51.0	53.0	55.0
	Burnhead	23.0	28.0	31.1	32.2	32.6	32.6	32.6	32.6	32.6
	RNB	43.0	42.9	42.7	42.6	43.7	47.9	50.9	53.0	55.0

Table 23 then shows the predicted noise level for the Proposed Development acting alongside the existing Drumduff site plus the proposed Heights Wind Farm development, compared to the RNB.

Table 23: Predicted Noise from the Proposed Development Compared to the RNB

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Drumbeg – Day	Predicted Level	23.7	28.3	31.8	32.8	32.9	32.8	32.8	32.7	32.7
	RNB	34.2	35.3	38.2	41.9	46.6	49.8	51.9	53.9	55.9
	Difference	10.5	6.9	6.4	9.1	13.7	17.0	19.1	21.2	23.2
Drumbeg – Night	Predicted Level	23.7	28.3	31.8	32.8	32.9	32.8	32.8	32.7	32.7
	RNB	42.9	42.6	42.2	41.9	43.1	47.7	50.8	52.9	54.9
	Difference	19.1	14.3	10.4	9.1	10.2	14.8	18.1	20.2	22.2
Blackridge- Closest – Day	Predicted Level	29.2	33.8	37.1	38.1	38.1	38.1	38.1	38.1	38.1
	RNB	34.7	36.4	39.4	42.6	46.8	49.9	51.9	54.0	56.0
	Difference	5.5	2.6	2.3	4.5	8.7	11.8	13.8	15.9	17.9
Blackridge-	Predicted Level	29.2	33.8	37.1	38.1	38.1	38.1	38.1	38.1	38.1

Receptor		Standardised 10m Height Wind Speed (m/s)								
		4	5	6	7	8	9	10	11	12
Closest – Night	RNB	43.0	42.9	42.7	42.6	43.7	47.9	50.9	53.0	55.0
	Difference	13.8	9.0	5.6	4.5	5.5	9.7	12.8	14.9	16.9

It can be seen that the predicted level for the Proposed Development acting alongside the existing Drumbeg turbines, and Proposed Heights Wind Farm Development, is well within the Remaining Noise Budget at these two locations and, by inference, at all locations in Blackridge.

4.6 Residual Effects and Conclusions

Proposed Mitigation/Monitoring

No mitigation is required, and no monitoring is proposed for the extension site. Noise limits in planning conditions should cover the combined effects of the extension and the existing site.

Residual Effects

There will be temporary audible noise from track construction works and HGV traffic accessing the site at properties on Heights Road. There will be increased turbine noise audible at Drumbeg and at properties in Blackridge.

Cumulative Effects

The combined effects of the Proposed Development acting alongside the existing turbines has been found to be not significant. The combined effects of the Proposed Development acting alongside the Proposed Heights Wind Farm Development as well as the existing turbines has also been found to be not significant.

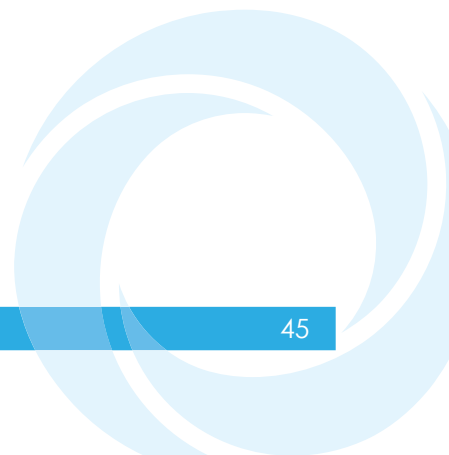
Summary

The assessment concludes that the construction, operation and de-commissioning of the extension can be carried out without significant impact at residential properties.

4.7 Summary and Statement of Significance

Construction noise and, by inference, that from decommissioning have been assessed according to the methodology identified in BS5228, Code of Practice for Noise and Vibration Control on Construction and Open Sites and found to meet the noise limits therein. As such, construction noise has been found to be insignificant.

Operational noise has been assessed according to the methodology in ETSU-R-97, The Assessment and Rating of noise from Wind Farms, and found to meet the limits therein. As such, operational noise has been found to be insignificant.



5 Conclusions

Following the receipt of consultation responses to the 2023 Planning Application for Drumduff Extension Wind Farm (0504/FUL/23) and further consultation with West Lothian Council, revisions have been made to the Proposed Development site design.

Further to this, the submission of an adjacent proposed wind farm development (Heights Wind Farm - 0434/FUL/23) has prompted a request to consider a revised cumulative assessment of potential effects in line with consultation feedback.

Due to the changes to the design of the Proposed Development (a reduction in T3 maximum tip height and amended infrastructure), reassessment has been undertaken where appropriate and as a result it is considered that for all of the technical topics aforementioned, at worst, the conclusions remain as per the 2023 EIA Report, and at best some elements are improved by the revisions.

Benefits include:

- Greater protection of nature conservation interests on and in the vicinity of the Proposed Development Site resulting in development having a greater ability to operate alongside some sensitive ecological features without impacting on them;
- Less peat will be affected as a result of the changes in infrastructure (floating access tracks on areas with peat deeper than 1m) and habitat will be improved;

Table 24 shows a summary of residual effects as a result of changes to the Proposed Development and cumulative assessment of Heights Wind Farm development proposal.

For the other receptors there may be some minor change, however, the residual effects are all minor or less and any change is not of sufficient magnitude to alter the residual effect.

Table 24: Summary of Effects

Mitigation Measures/Rationale	Residual Effect Significance
Ecology and Ornithology	
<ul style="list-style-type: none"> • Biodiversity Enhancement measures leading to net habitat creation and raised bog restoration. • Increase areas of local and national priority habitats (native woodland and raised bog). 	Positive significant effect
<u>Construction</u> <ul style="list-style-type: none"> • During construction, impacts to biodiversity will be minimised through the implementation of a CEMP and a Species Protection Plan and an Ecological Clerk of Works (ECoW) will monitor compliance. 	Not significant
<u>Operation</u> <ul style="list-style-type: none"> • During operation, an Operation Environmental Management Plan and Habitat Management Plan (HMP) will be followed and positive effects to biodiversity monitored until Year 10 of operation in line with the HMP. • Operational monitoring will focus on the water table, native broadleaved woodland planting, ornithology and habitats. 	Positive significant effect
Hydrology and Peat	
Mitigation in the form of a detailed Construction Environmental Management Plan (CEMP) will be in place, which includes:	

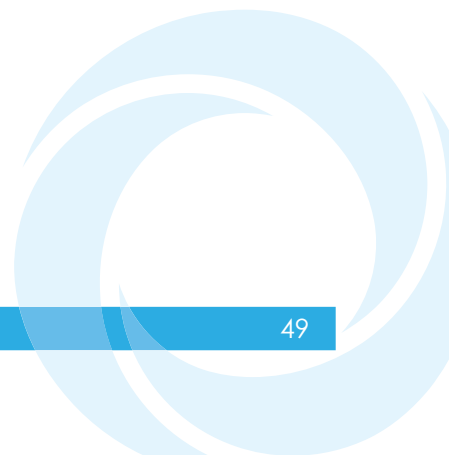
Mitigation Measures/Rationale	Residual Effect Significance
<ul style="list-style-type: none"> • Drainage Management Plan (DMP); • Pollution Prevention Plan (PPP); • Peat Management Plan (PMP); • Habitat Management Plan (HMP); • Emergency Response Plan (ERP); and • Water Quality Monitoring Programme (WQMP). <p>Construction and operation will also be carried out in line with SEPA guidelines and best practice measures in relation to peat.</p> <p><u>Construction & Operation</u></p> <ul style="list-style-type: none"> • Hydrological connectivity (or lack thereof) results in a significantly reduced potential (if any) for hydrological effects to Blawthorn Moss SAC and Heights Wind Farm development parcels. • Aerial deposition and potential for pollution effects will be managed through mitigation. • No significant residual effects are predicted on peat body within Blawthorn Moss SAC or Heights Wind Farm with mitigation in place. 	Not significant
Landscape and Visual	
<p>Reduced height of Turbine 3 to a maximum height of 135m will improve the composition in views from East Craigs Hill and lead to reduced visibility of the Proposed Development turbine from:</p> <ul style="list-style-type: none"> • North edge of Blackridge Settlement; • Blawthorn Moss; and • North of the Beechbrae Woodland Centre. <p>Residual Significant Effects at other receptor locations remain similar to those outlined in Table 17-1, Chapter 17, Volume 2 of the EIA Report.</p> <p><u>Additional viewpoint - Harthill Road, Blackridge (Operational effects)</u></p> <p>Significant residual effect on residents.</p> <p>Visual operational effects on road users are not significant.</p> <p><u>Cumulative effects</u></p> <ul style="list-style-type: none"> • In combination with Heights Wind Farm, the total cumulative effect is significant in terms of a local setting. • Whilst effects will be considered locally to the Proposed Development Site, it is considered these local effects can be accommodated within the wider landscape as the large-scale open plateau with forestry and wind farm landscape is considered to have attributes which are suited to further wind farm development. 	<p>Significant</p> <p>Significant for residents Not significant for road users</p> <p>Significant</p>
Cultural Heritage	
<ul style="list-style-type: none"> • A WSI for a programme of archaeological works has been recommended as part of the mitigation as in Chapter 10 of the EIAR. <p><u>Woodend Farmstead (Asset 24, SM 11222)</u></p> <ul style="list-style-type: none"> • The Proposed Development would not affect an ability to understand, appreciate or experience this monument and the integrity of its setting would not be adversely affected. • For these reasons the magnitude of impact upon the setting of this asset is predicted to be medium, and given its low sensitivity, it is considered that the resulting effect on Woodend Farm farmstead would be minor adverse and not 	Not significant

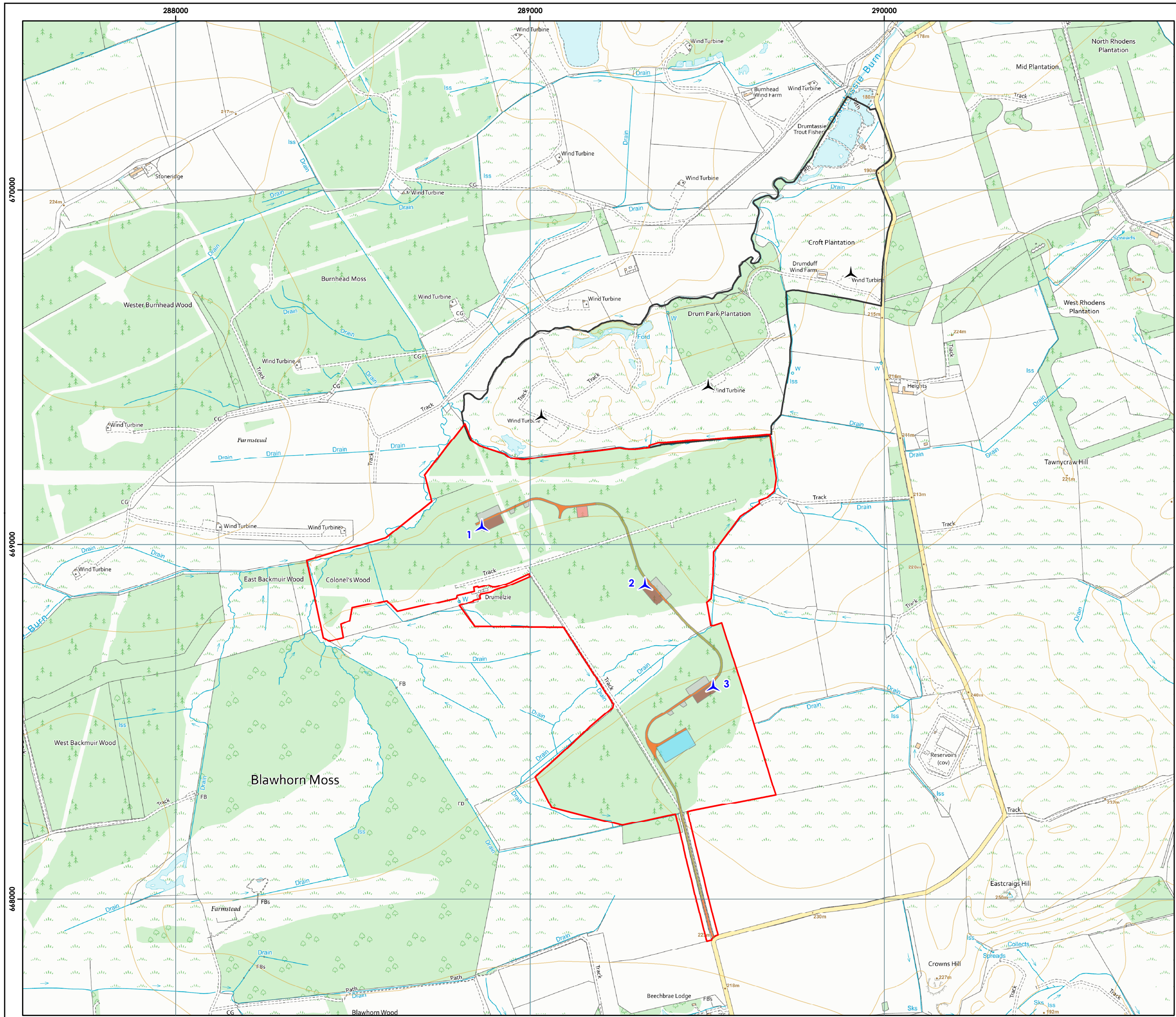
Mitigation Measures/Rationale	Residual Effect Significance
<p>significant.</p> <p><u>Craigmarry Farmstead (Asset 13, SM 11223)</u></p> <ul style="list-style-type: none"> The Proposed Development would not affect an ability to understand, appreciate or experience this monument. For these reasons the magnitude of impact upon the setting of this asset is predicted to be medium, and given its low sensitivity, it is considered that the resulting effect on Craigmarry farmstead would be minor adverse and not significant. <p><u>Cumulative effects</u></p> <ul style="list-style-type: none"> The cumulative effect of including the Proposed Development alongside Heights Wind Farm development in the baseline for both assets will be negligible adverse. 	Not significant
Noise	
<ul style="list-style-type: none"> No mitigation is required, and no monitoring is proposed for the Proposed Development. <p><u>Construction</u></p> <ul style="list-style-type: none"> Construction and decommissioning noise has been assessed in line with BS5228 guidance and have been found to meet the noise limits therein. <p><u>Operation</u></p> <ul style="list-style-type: none"> Operational noise has been assessed according to the methodology in ETSU-R-97 and found to meet the limits therein. <p><u>Cumulative effects</u></p> <ul style="list-style-type: none"> The combined effects of the Proposed Development, existing turbines and the Proposed Heights Wind Farm development on surrounding residential receptors was assessed. Noise limits in planning conditions should cover the combined effects of the Proposed Development, existing development and proposed Heights Wind Farm development. 	<p>Not significant</p> <p>Not significant</p> <p>Not significant</p>

Appendices

Appendix A. Updated Site Layout

Figures 1-2 and 4-8 of Volume 4a the EIA Report have been updated to reflect the latest changes to the Site Layout as presented in the revised Figure A-1-2 and Figure A4-8 Interpolated Peat Depth below. These figures supersede Figure 1-2 and Figure 4-8 submitted as part of the EIA Report for the Proposed Development.





Drumduff Extension Wind Farm



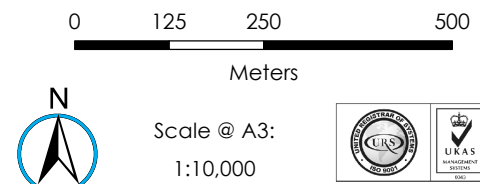
Figure A1-2
Site Layout

Key

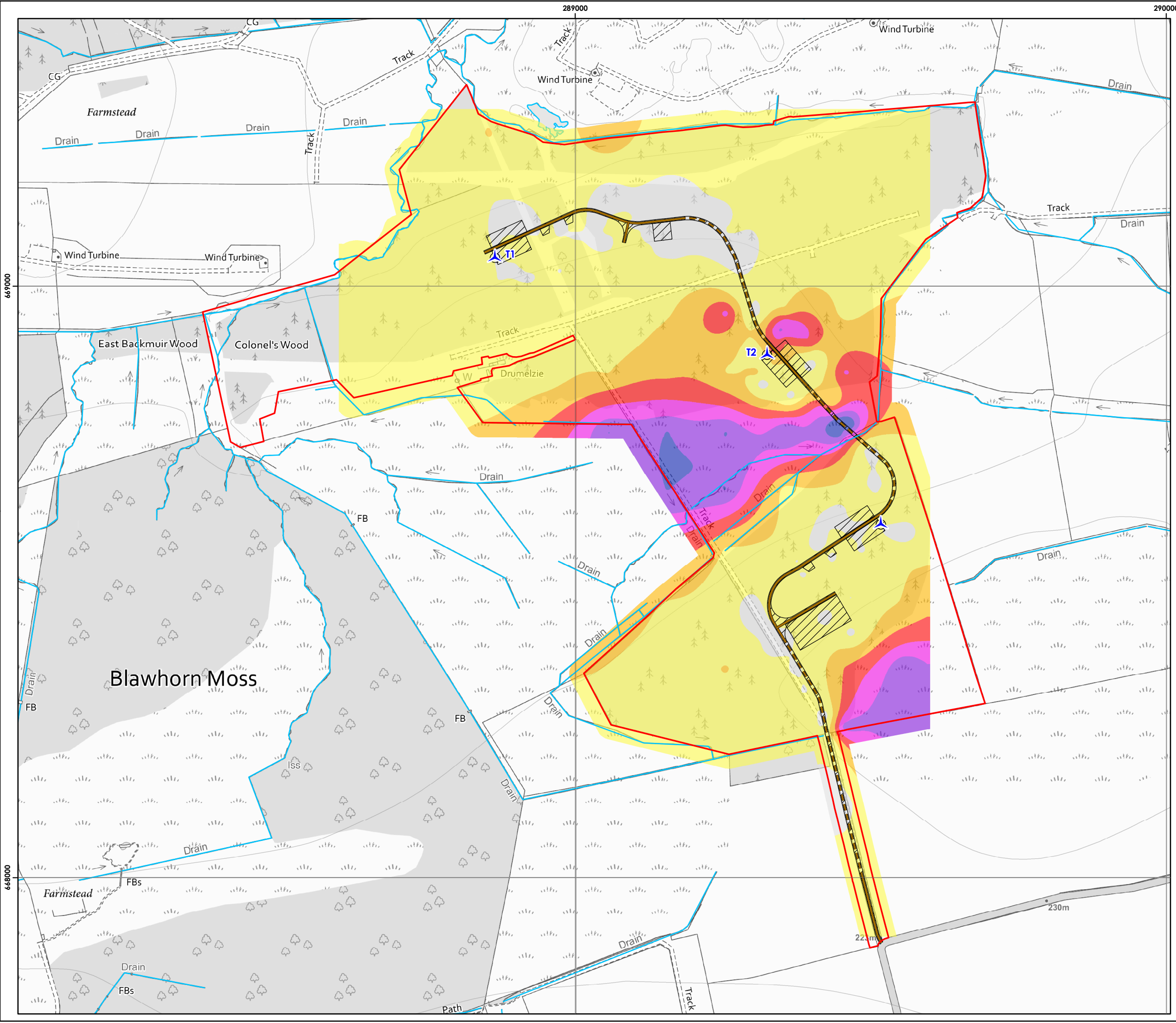
- Site boundary
- Proposed turbine location
- Drumduff operational wind farm
- Existing Drumduff wind turbine

Site infrastructure

- Temporary hardstanding
- Turbine foundation
- Main Hardstanding
- Substation
- Construction compound
- Access track – floating
- Access track – cut



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Drumduff Extension Wind Farm



Figure A8-4
Interpolated peat depth

Key

- Site boundary
- Proposed turbine
- New access track - cut
- New access track - floating
- Proposed infrastructure
- Drain
- Watercourse

Interpolated Peat Depth

- < 0.5m
- 0.5 - 1m
- 1 - 1.5m
- 1.5 - 2m
- 2 - 2.5m
- 2.5 - 3m
- > 3m



0 50 100 200
Meters

N

Scale @ A3:
1:6,000

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Appendix B. Supplementary Environmental Information: Ecology and Ornithology

Matthew Watson

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Reg No: SC177881

Supplementary Information for Drumduff Wind Farm Extension EIA: Ecology and Ornithology

Dear Matthew,

This letter has been produced by Natural Power on behalf of Drumduff Extension Ltd (the Applicant) in order to provide supplementary ecology and ornithology information for the Drumduff Wind Farm Extension project (the "Proposed Development") as requested by the West Lothian Council (WLC; consultation response dated 28 July 2023).

1. Potential bat roosts

WLC highlighted two potential bat roost features that were mentioned within the target notes (TNs) of the extended Phase 1 Habitat survey: TN 6 and TN 13.

TN 6 highlights mature beech trees along the existing forestry track that may have had potential bat roost features. A bat roost assessment was undertaken in September 2021 and no potential roosting features were identified in these trees. Additionally, there was no evidence from bat activity surveys to suggest that a significant bat roost was present in the vicinity of any bat detectors. The only species that were recorded within 30 minutes of sunrise or sunset were common and soprano pipistrelles, both of which will sometimes emerge from a roost within 20 minutes of sunrise¹. 8% of soprano pipistrelle passes and 1% of common pipistrelle passes were recorded within 30 minutes of sunset or sunrise. Detector 2 was located along the existing forestry track where the line of mature beech trees were recorded and only one bat pass was recorded within 30 minutes of sunrise or sunset at this location. Therefore, it is unlikely that a significant bat roost was within any trees along this section of track.

TN 13 highlights a ruined building that has low-negligible bat roost potential, is over 100 m from any proposed infrastructure and will be unaffected by the Proposed Development.

Pre-construction and pre-felling bat roost surveys will be undertaken if the Proposed Development is consented. Details of these surveys and any mitigation required if potential bat roosts are found will be included as part of the Species Protection Plan (SPP) that will be produced as part of the Construction Environmental Management Plan (CEMP).

¹ Andrews, H. and Pearson, L. (2017) A review of empirical data in respect of emergence and return times reported for the UK's 17 native bat species. Andrews Ecology, Bridgewater.

2. Protected mammals

WLC requested clarification on the presence of otter, water vole, pine marten and red squirrel signs within the Proposed Development during protected mammal surveys. As stated in the protected mammal surveys results, Section 6.4.2 of Chapter 6: Ecology, the only signs of protected mammals that were found during surveys were badger. No signs of otter, water vole, pine marten or red squirrel were recorded during surveys. It was therefore presumed that these species were absent from the area or present in only in very low numbers and therefore no impact assessment was undertaken. However, as there is still the potential for these species to be present within the site during the construction period, pre-construction protected mammal surveys will be undertaken. Details of these surveys and any mitigation required if protected mammals are found will be included as part of the SPP that will be produced as part of the CEMP.

3. Ornithology

WLC highlighted that short-eared owl were recorded during the ornithological baseline surveys for the neighbouring application, Heights Wind Farm. It is stated in the Heights Wind Farm EIA² that short-eared owl were possibly breeding within the Blawhorn Moss SAC in 2021. The only detailed survey results available within the Heights Wind Farm EIA Chapter 10: Ornithology are for Vantage Point (VP) surveys, during which there were three records of short-eared owl during the 2021 breeding season (April to September) and one record in the 2021/22 non-breeding season (October 2021 to March 2022). All flights were located to the east of the Proposed Development. One flightline was recorded with a portion within the development boundary of Drumduff Wind Farm Extension, heading in the direction of Blawhorn Moss. However, this flight was recorded during the non-breeding season. It is therefore unclear what information the suggestion that there was possibly short-eared owl breeding within Blawhorn Moss was based on. There were no records of short-eared owl during the 2021 breeding season surveys for the Proposed Development and therefore there is no data upon which to base a collision assessment. VP surveys included hours around dawn and dusk and covered a large portion of Blawhorn Moss lying within 1 km of the development boundary of Drumduff Wind Farm Extension. Furthermore, Lothian and Borders Raptor Study Group (LBRSG) and Central Scotland Raptor Study Group (CSRSG) provided data as part of the Drumduff Wind Farm Extension EIA. There was no data including any short-eared owl nesting records within 10 km of the Proposed Development. Therefore, there is no evidence to suggest that there were breeding short-eared owl within Blawhorn Moss SAC. Furthermore, short-eared owls are highly nomadic³ and it is not unusual for territories to be only periodically occupied. Although there is no evidence of a short-eared owl nest in Blawhorn Moss SAC, nonetheless pre-construction breeding bird surveys will be undertaken if the Proposed Development is consented. Details of these surveys and any mitigation required if breeding birds are found will be included as part of the SPP that will be produced as part of the CEMP.

WLC also asked for clarity on whether Heights Wind Farm needed to be considered for cumulative impacts on birds. No Collision Risk Modelling (CRM) was undertaken as part of the Heights Wind Farm EIA Chapter 10: Ornithology and no significant effects were predicted for the development. There is therefore considered to be no additional cumulative impact on ornithological features as a result of Heights Wind Farm.

4. National Planning Framework 4

² Greencat Renewables (2023) Heights Wind Farm EIA.

³ British Trust for Ornithology (BTO) (undated) Short-eared owl tracking. Available at: <https://www.bto.org/our-science/topics/tracking/tracking-studies/short-eared-owl-tracking>

Date: 03/10/2023

1328762



WLC requested clarification on the biodiversity enhancement proposed within the outline Habitat Management Plan (HMP). See Table 1 (Appendix A) for the completed table for Delivering Positive Effects for Biodiversity outlining the mitigation and enhancement proposed as part of the Proposed Development.

Yours sincerely

A handwritten signature in black ink, appearing to read "Nicole Dunn".

Nicole Dunn
Senior Ecologist
07469 352 052
nicoled@naturalpower.com

Encl.

cc. Sam Layton

Appendices

A. Delivering Positive Effects for Biodiversity

Table 1: Delivering Positive Effects for Biodiversity – West Lothian Council local development template

Delivering Positive Effects	
The site	<p>The Proposed Development site consists of mostly conifer plantation and forestry ride habitat. Coniferous woodland is the predominant habitat, though the site also comprises two areas of (raised) modified bog which are Local Biodiversity Sites (LBS): East Blawhorn LBS and West Craigs Moss LBS. Drumtassie Burn is located to the north of the development running parallel to the site boundary, and several small watercourses exist within the site in the middle of the East Blawhorn LBS (likely related to drainage systems rather than natural features).</p> <p>One year of ecology baseline surveys were conducted in 2021 including Extended Phase 1/National Vegetation Classification (NVC), bat surveys (preliminary roost assessment and static detector), protected mammal surveys, and great crested newt survey. One year of ornithological baseline surveys were also conducted from March 2021 – February 2022 including breeding season Vantage Point (VP), Breeding Bird Survey (BBS), breeding raptor, black grouse lek surveys, and non-breeding season VP surveys.</p> <p>The key findings of the ecology and ornithology baseline surveys are as follows:</p> <ul style="list-style-type: none"> • The site area (77.9 ha) mostly consists of extensive conifer plantation (52.1 ha), marshy grassland (10.7 ha), raised/modified bog (7.2 ha), and unimproved neutral grassland (1.73 ha); • Four NVC communities found to be indicative of potential GWDTEs (for further information see EIA Chapter 8: Hydrology, Hydrogeology, Peat and Soils of the EIA Report); • No bat potential roosting features were identified within 200 m of infrastructure; • Bat activity surveys recorded common and soprano pipistrelle, Myotis sp., Nyctalus sp. and brown long-eared bat activity; • During protected mammal surveys only badger signs were found. One badger sett was recorded within the 250 m buffer of the Proposed Development site; • No signs of great crested newt were found, although two out of four ponds were recorded as having good habitat suitability; • Breeding season VPs found that curlew was the most frequently recorded species and that pink-footed goose was recorded in the greatest numbers. Non-breeding season VPs found that pink-footed goose was the most frequently recorded and numerous species; • BBS found a single territory just outwith the Proposed Development boundary related to curlew; • No records of breeding raptors; and • No records of black grouse.
The proposed development	<p>The Proposed Development is an extension of the existing Drumduff Wind Farm of an additional three turbines and associated infrastructure. The Proposed Development will involve felling of areas of conifer plantation prior to the construction of infrastructure (for further information see Appendix 6.4: Outline Habitat Management Plan of the EIA Report). A small area of native broadleaved</p>

Delivering Positive Effects

woodland (0.01 ha) that falls within the clear fell buffer zone of the proposed turbine 1 will also be felled.

Proposed biodiversity measures and a future management plan for the Proposed Development are outlined in the Outline Habitat Management Plan (EIA Report, Chapter 6.4). The main aims for this HMP are restoration of raised bog in areas of felling and planting of native broadleaved woodland.

Relevant strategies, plans & documents informing measures	Local nature designated sites within the Proposed Development area include West Craigs Moss LBS that is partially within the site boundary and designated for modified bog habitat, and East Blawhorn LBS that's entirely within the site, though no information was found regarding its designation, it is assumed that it's designated for raised bog. Two local designated sites adjacent to the Proposed Development were also identified: Drumtassie Old Workings LBS designated for swamp and standing water habitat, and snipe and common toad species; and West Blawhorn Moss Site of Special Scientific Interest (SSSI)/ Special Area of Conservation (SAC)/ National Nature Reserve (NNR) is designated for raised bog habitat.
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Stakeholder engagement	The Wildlife Information Centre (TWIC), Glasgow Museums Biological Records Centre (GMBRC), Central Scotland Raptor Study Group (CSRSG), Southern Uplands Partnership (SUP), and Lothian and Borders Raptor Study Group (LBRSG) were all contacted in late 2022 to conduct a data search for protected species within a 10 km buffer (5 km buffer for birds except for a 25 km buffer for geese and gulls, and a 10 km buffer for black grouse) of the Proposed Development area within the past ten years. This data search returned information regarding protected mammal species such as badger, pine marten, and multiple bat species. The data regarding birds found records of four Schedule 1 raptor species (osprey goshawk, hen harrier, and peregrine), seventeen species of wader (five breeding), five probable or confirmed passerine species of high conservation concern, and a variety of waterfowl species mostly recorded around other local waterbodies within the 25 km buffer. For further information see Chapter 6: Ecology and Chapter 7: Ornithology of the EIA Report.
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The summary of engagement with local wildlife and community groups, and other Non-Governmental Organisations (NGOs), and key findings are as follows:

- NatureScot were engaged with in July 2021 regarding baseline survey methods. Their response requested that up-to-date guidance was followed; and that an assessment on the potential of hydrological or other impacts on Blawhorn Moss SSSI/SAC/NNR was undertaken and Habitats Regulations Appraisal (HRA) screening was undertaken as part of the EIA (see Appendix 6.3: Report to inform an Appropriate Assessment of the EIA Report);
- In March 2023, NatureScot were once more engaged with to seek advice on assessing bat activity with Ecobat being offline and they approved a suggestion for an alternative assessment using bat activity information from the EIA Reports of nearby wind farms;
- Furthermore, NatureScot confirmed that pink-footed goose data collected during baseline surveys was likely migration and not related to the nearby Firth of Forth SPA, and therefore one year of surveys would be sufficient for HRA screening for this sites; and
- WLC were also contacted on 29 November 2022 and again on the 15 February 2023 regarding the ecology surveys undertaken at the Proposed Development and the nature of the EIAR. However, no response was received.

Actions Considered	Mitigation/Compensation (measures included to minimise or compensate impacts)	Enhancement (Measures included to enhance biodiversity, or an explanation for not applying these)
Protection and enhancement of existing habitats on or adjacent to the site	<ul style="list-style-type: none"> • During construction, good site management practices will be implemented to minimise the encroachment of the construction corridor into adjacent existing habitats. • To prevent and minimise pollution events, pollution prevention measures will be implemented during construction, and the operational phase during maintenance works. These measures will be detailed in the CEMP and overseen by the ECoW. • During the preparation and construction phase, measures to control and minimise dust pollution will be taken, particularly in dry weather or active areas of development. Control will involve the dampening of tracks utilised by construction vehicles. Further detail of the mitigation of potential dust impacts will be detailed within the CEMP. • Watercourse protection measures will be outlined in the CEMP. These will include the implementation of a pollution response plan and safe storage of chemicals in bunded containers. Refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, located at least 50 m away from any watercourse. Water quality will be monitored before and during construction. 	<p>The majority of the Proposed Development site consists of coniferous plantation that provides limited conservation or biodiversity value. Therefore, all enhancement measures set out in Appendix 6.4: Outline Habitat Management Plan of the EIA Report are related to habitat creation after conifer felling.</p>
Creation of new habitat on the site	<ul style="list-style-type: none"> • Native broadleaved woodland planting will be undertaken to compensate for the permanent loss of 0.01 ha of semi-natural broadleaved woodland from felling within the 97.2 m turbine buffer. • Bog restoration will be undertaken to compensate for the permanent loss of 0.05 ha of bog habitat from infrastructure construction. 	<ul style="list-style-type: none"> • Native broadleaf tree planting will result in a net creation of 2.88 ha of woodland within the Proposed Development site and will be carried out immediately post construction. This will be undertaken in the north of the Proposed Development site, see Appendix 6.4: Outline Habitat Management Plan of the EIA Report for further details. The trees and shrubs planted will reflect the NVC woodland type of the local soils and climate (likely to be NVC W7 Alder- Ash- Yellow pimpernel

Actions Considered	Mitigation/Compensation (measures included to minimise or compensate impacts)	Enhancement (Measures included to enhance biodiversity, or an explanation for not applying these)
		<p>woodland). The replanting will follow standard practices, ground preparation will be carried out before planting to create mounds, except in areas near watercourse or difficult terrain.</p> <ul style="list-style-type: none"> • 23.17 ha of bog habitat damaged/degraded by long-term afforestation will be restored to raised bog habitats. Restoration is planned through felling of conifer plantation, and water table restoration techniques such as stump and root plate mulching, ground smoothing, furrow blocking, and drain blocking (for further information see Chapter 6.4: Outline Habitat Management Plan of the EIA Report). This habitat creation will produce a net gain of 23.12 ha for raised/modified bog habitat.
Protection and enhancement of connectivity through the site and with its surroundings	The layout of the Proposed Development has avoided impacts to sensitive habitats where possible (e.g. raised bog), and areas of peat, taking into account other constraints. Where avoidance has not been possible, the infrastructure will be constructed in such a way as to maintain the integrity and hydrological connectivity of hydrologically sensitive habitats.	<ul style="list-style-type: none"> • Raised bog restoration within the Proposed development site will enhance the habitat connectivity of East Blawhorn Moss LBS and Craigs Moss LBS as the restoration will create a corridor of raised bog between these two sites. Additionally, the connectivity of Blawhorn Moss SAC and the two LBSs will be enhanced through creation of new bog habitat in areas adjacent to all sites. • Planting of native broadleaf woodland will also enhance habitat connectivity along the Drumtassie Burn, creating a wildlife corridor for species such as badgers, bats and other woodland mammal species.
Protection and enhancement of existing species on or adjacent to the site	<ul style="list-style-type: none"> • During the construction phase, a SPP will be produced to minimise the risk of negative impacts to species within the Proposed Development. The SPP will include good practice measures to prevent accidental mortality or disturbance of protected species during construction. • During the operational phase, an Operational Environmental Management Plan (OEMP) will be created detailing mitigation measures relating to protected 	<ul style="list-style-type: none"> • Native broadleaf planting will enhance existing species on site via habitat creation. Species that are likely to benefit from woodland planting include badgers, bats, woodland bird species and other woodland mammals. • Bog restoration will enhance habitats and create new feeding and breeding grounds for protected bird species known to occur within the Proposed Development (i.e., curlew and snipe).

Actions Considered	Mitigation/Compensation (measures included to minimise or compensate impacts)	Enhancement (Measures included to enhance biodiversity, or an explanation for not applying these)
	<p>species to ensure ongoing compliance with relevant environmental legislation.</p> <ul style="list-style-type: none"> • A minimum distance of 50 m will be maintained between the Proposed Development and watercourses (except for one watercourse crossing), thereby maintain watercourse connectivity. • To minimise the risk of bat collision, operational turbine blades will have a 50 m separation distance from high-value bat habitats. As a result, all trees and woodland within 97.2 m buffer of proposed turbines will be felled during the construction phase. Any trees and scrub that self-seed within this buffer during the operational phase will also be cleared to maintain this over time. For further details see Appendix 6.4: Outline Habitat Management Plan of the EIA Report. 	
Enhancement for new species	N/A	<ul style="list-style-type: none"> • Bog restoration will create and enhance suitable habitats for local plant and invertebrate priority species associated with bog as well as open ground breeding birds such as skylarks and meadow pipits. • Native woodland planting will also create suitable habitat for woodland species, such as small passerine birds, woodpeckers, red squirrel and local plant and invertebrate priority species associated with woodlands.
Avoidance, control and removal of invasive species from the site	No invasive species were recorded on site.	Monitoring of conifer regeneration within areas of bog restoration will be undertaken as part of operational monitoring. Any invasive non-native species presence will also be recorded during operational monitoring and controlled if found.
Protecting wildlife from negative interactions with	<ul style="list-style-type: none"> • To minimise the risk of bat collision, operational turbine blades will have a 50 m separation distance from high-value bat habitats. As a result, all trees and woodland within 97.2 m buffer of proposed turbines 	<ul style="list-style-type: none"> • Operational monitoring will be undertaken within the areas of bog restoration and tree planting to monitor the success of measures. This will include beat-up surveys to monitor tree planting and monitoring conifer sapling

Actions Considered	Mitigation/Compensation (measures included to minimise or compensate impacts)	Enhancement (Measures included to enhance biodiversity, or an explanation for not applying these)
people and / or infrastructure	<p>will be felled during the construction phase. Any trees and scrub that self-seed within this buffer during the operational phase will also be cleared to maintain this over time. For further details see Appendix 6.4: Outline Habitat Management Plan of the EIA Report.</p> <ul style="list-style-type: none"> • Turbine blades will be “feathered” to reduce rotation speeds below 2 rpm when idling to reduce bat collisions. • A minimum distance of 50 m will be maintained between the Proposed Development and watercourses (except for at watercourse crossings). This will reduce the impact on water quality and local hydrological functions. Further details will be included in the CEMP. • The Proposed Development has avoided impacts to sensitive habitats such as raised bog and peat where possible. Where avoidance was not possible, infrastructure will be constructed whilst maintaining hydrological connectivity of hydrologically sensitive habitats. • A Species Protection Plan (SPP) will be included as part of the CEMP and this will outline mitigation to minimise impacts on protected species (including birds). This will be carried out through pre-construction and pre-felling surveys and the implementation of disturbance buffers around resting places or nests. 	<p>regeneration across bog restoration. Conifer saplings will be removed where they are identified as an issue during operational monitoring. Planted trees that do not take will be replaced where identified during beat-up surveys.</p>
Promoting awareness and encouraging further actions for nature	<ul style="list-style-type: none"> • Employing an ECoW to oversee enabling and construction works to monitor good practice and ensure that works are carried out in accordance with the CEMP. Where possible, an allowance of 50 m micro-siting of infrastructure will occur during construction to ensure sensitive habitats or 	<ul style="list-style-type: none"> • A Habitat Management Plan will be written prior to construction commencing. This will be in effect for the lifetime of the Proposed Development. An outline HMP is included in Appendix 6.4 of the EIA Report.

Actions Considered	Mitigation/Compensation (measures included to minimise or compensate impacts)	Enhancement (Measures included to enhance biodiversity, or an explanation for not applying these)
	<p>any other ecological constraints are not impacted.</p> <ul style="list-style-type: none"> The construction team will be informed of the sensitivities of any protected species present onsite by the appointed ECoW. The SPP will highlight any potential breeding bird or protected species present at the Proposed Development and outline measures for their protection. 	
SUMMARY: Positive effects that will be delivered	<p>The overall positive effects for biodiversity that will be delivered include planting of native broadleaved woodland leading to net habitat creation and raised bog restoration. This will provide new and extended habitat for local priority species (e.g. bog and woodland plants and invertebrates) and will increase the area of local and national priority habitats (native woodland and raised bog) within the Proposed Development Area.</p> <p>During construction, negative impacts to biodiversity will be minimised via the implementation of a CEMP and a SPP, and an ECoW employed to monitor compliance. During the operational phase, an OEMP and HMP will then be followed.</p> <p>During the operational phase, the positive effects to biodiversity from the Proposed Development will be monitored until at least the tenth year of operation as outlined in the outline Habitat Management Plan. Monitoring will focus on the water table (using dipwells), native broadleaved woodland planting, ornithology, and habitats within the Proposed Development.</p>	

Source: WLC/Natural Power

Appendix C. Updated Carbon Calculator inputs and key findings

This Appendix presents the findings of the revised Carbon Calculations prepared for the Proposed Development to include changes to floating access track lengths and turbine T3 capacity and should be read in conjunction with Chapter 14: Climate Change and Carbon Balance, Volume 2 of the EIA Report.

The Scottish Government's Online Carbon Calculator v1.7.0 was used to calculate the carbon cost and payback period of the Proposed Development. The online Reference for the Carbon Calculator is WH2V-C17Y-XOMD V7 and Table C-1 and Table C-2, presented below summarise the outputs and inputs to the carbon calculator, respectively. These are presented with 'Expected' values – the best estimate of the anticipated value, based on the current understanding of the Proposed Development – along with 'minimum' and 'maximum' values to give a range of possible outputs, dependant on the variables within the model. These tables supersede those included in Technical Appendix 14-1, Volume 3 of the EIA Report.

A comparison with outputs of the previous revision (V6) of the Carbon Calculator (Technical Appendix 14-1, Vol. 3 of the EIA Report) suggest that whilst the total expected carbon dioxide (CO₂) emission savings are lower in the latest version (V7, Table C-1), primarily due to the reduction in power capacity associated with a shorter turbine for T3, there is an expected decrease in total CO₂ emissions due to the Proposed Development.

Table C-1: Payback time and CO₂ emissions

	Expected	Minimum	Maximum
1: Wind farm CO₂ Emission Saving over (tonnes CO₂ eq.):			
Coal Fired electricity Generation	39,459	27,227	48,228
Grid mix of electricity generation	7,615	5,255	9,308
Fossil fuel mix of electricity generation	17,012	11,739	20,793
Energy output from windfarm over lifetime (30 years) (MWh)	1,575,223	1,086,904	1,925,273
Total CO₂ emissions due to wind farm (tCO₂ eq.)			
2. Emissions due to turbine life (e.g. manufacture, construction, decommissioning)	11,954	9,010	13,355
3. Emissions due to backup	10,218	7,834	11,353
4. Emissions due to reduced carbon fixing potential	468	132	2,453
5. Emissions from soil organic matter	8,011	4,188	26,395
6. Emissions due to DOC & POC leaching	43	0	210
7. Emissions due to felling forestry	4,726	3,828	5,718
Total emissions of Carbon dioxide (CO ₂)	35,419	24,992	59,485
Total CO₂ gain due to improvement of site (tCO₂ eq.)			
8a. Gains due to improvement of degraded bogs	-3,198	0	-6,900
8b. Gains due to improvement of felled forestry	-1,739	0	-4,127
8c. Gains due to restoration of peat form	0	0	0

	Expected	Minimum	Maximum
borrow pits			
8d. Gains due to removal of drainage from foundations and hardstandings	-436	0	-5,091
Total gains	-5,372	0	-16,119
Results: Carbon Payback Time			
Net emissions of carbon dioxide (tCO ₂ eq.)	30,047	8,873	59,485
Coal Fired electricity Generation (years)	0.8	0.2	2.2
Grid mix of electricity generation (years)	3.9	1.0	11.3
Fossil fuel mix of electricity generation (years)	1.8	0.4	5.1
Carbon Intensity (gCO ₂ e/kWh)	19.07	4.61	54.73

Table C-2: Inputs into the Scottish Government Carbon Calculator

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
Windfarm characteristics				
No. of turbines	3	3	3	Chapter 3: Description of Development
Duration of consent (years)	40	40	40	Chapter 3: Description of Development
Performance				
Power rating of 1 turbine (MW)	4.5	3.45	5	Chapter 3: Description of Development
Capacity factor	33.3	29.97	36.63	Expected, Min and Max values taken as the average from 2017 to 2021 the BEIS Digest of UK Energy Statistics (DUKES) Load factors for renewable electricity generation for 2021 (BEIS, 2022)
Backup				
Fraction of output to backup (%)	5	5	5	<p>The extra electricity generation capacity required to maintain electricity supply during times of low wind generation.</p> <p>The extra capacity needed for backup power generation, backup is currently estimated to be 5% of the rated capacity of the wind plant if wind power contributes more than 20% to the national grid (Dale <i>et al.</i>, 2004).</p>
Additional emissions due to reduced thermal efficiency of the reserve generation (%)	10	10	10	Fixed
Total CO ₂ emission from turbine life	Calculate wrt	Calculate wrt	Calculate wrt	Fixed

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
(tCO ₂ MW-1) (eg. manufacture, construction, decommissioning)	installed capacity	installed capacity	installed capacity	
Characteristics of peatland before windfarm development				
Type of peatland	Acid bog	Acid bog	Acid bog	Technical Appendix 8-2: Peat Management Plan (PMP)
Average annual air temperature at site (°C)	7.89	4.77	11.01	Taken from nearest met office weather station Salsburgh Climate Station 1991 - 2000.
Average depth of peat at site (m)	0.98	0.882	1.078	See Technical Appendix 8-2: Peat Management Plan
C Content of dry peat (% by weight)	55	49	62	Default value: An estimate of the range of %C in peat of between 49% and 62% is provided by Birnie <i>et al.</i> (1991).
Average extent of drainage around drainage features at site (m)	10	5	50	Generic precautionary values have been entered into the carbon calculator as follows: expected = 10m; minimum = 5m; and maximum = 50m as per Windfarm Carbon Calculator Web Tool User Guidance (SEPA, n.d)
Average water table depth at site (m)	0.3	0.1	0.5	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for degraded peat, reasonable estimated minimum, expected and maximum values are: 0.1m, 0.3m and 0.5m, respectively. As noted in Technical Appendix 8.2: PMP, a review of site conditions indicated that although the site is not heavily drained it is dominated acid bog which is nutrient poor and dominated by <i>Sphagnum</i> moss.
Dry soil bulk density (g/cm ³)	0.2	0.18	0.22	The Windfarm Carbon Calculator Web Tool User Guidance (SEPA, n.d) notes that given the difficulty of collecting sufficient samples to derive a representative site-specific value for this parameter, Scottish generic values for peat may be used instead: as derived from the National Soil Inventory of Scotland (Lilly <i>et al.</i> , 2010), is 0.2g/cm ³ , +/-10%
Characteristics of bog plants				
Time required for regeneration of bog plants after restoration (years)	10	5	15	Generic assumptions: "The physical and hydrological restoration of the site post construction, even if no wider site improvements and restoration are undertaken, should allow the

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
				vegetation to recover more rapidly than within 15 years'. SEPA (n.d) Windfarm Carbon Calculator Web Tool User Guidance
Carbon accumulation due to C fixation by bog plants in undrained peats (tC ha ⁻¹ yr ⁻¹)	0.25	0.12	0.31	Carbon Calculator default value: Apparent C accumulation rate in peatland is 0.12 to 0.31tC ha ⁻¹ yr ⁻¹ (Turunen <i>et al.</i> , 2001; Botch <i>et al.</i> , 1995). The SNH guidance uses a value of 0.25 tC ha ⁻¹ yr ⁻¹ .
Forestry Plantation Characteristics				
Area of forestry plantation to be felled (ha)	8.95	8.05	9.85	Please see Chapter 12 Forestry. Table 12.3 & 12.4. As per the Windfarm Carbon Calculator Web Tool User Guidance, the area of forestry plantation to be felled (ha) should be the net loss of forestry as a result of the windfarm development proposals, i.e. this should be total felled area minus the area to be replanted. Carbon Calculator requires the minimum and maximum values to be less than and greater than the expected value therefore +/- 10% used. Total felling minus total to be replanted (38.0ha minus 29.05ha = 8.95ha)
Average rate of carbon sequestration in timber (tC ha ⁻¹ yr ⁻¹)	3.6	3.24	3.96	Plantation carbon sequestration. This is dependent on the yield class of the forestry. The SNH technical guidance assumed yield class of 16 m ³ ha ⁻¹ yr ⁻¹ , compared to the value of 14m ³ ha ⁻¹ yr ⁻¹ provided by the Forestry Commission. Carbon sequestered for yield class 16 m ³ ha ⁻¹ yr ⁻¹ = 3.6tC ha ⁻¹ yr ⁻¹ (Cannell, 1999)." +/-10% used for maximum and minimum values
Counterfactual emission factors				
Coal-red plant emission factor (tCO ₂ MWh ⁻¹)	Fixed	Fixed	Fixed	Fixed
Grid-mix emission factor (tCO ₂ MWh ⁻¹)	Fixed	Fixed	Fixed	Fixed
Fossil fuel-mix emission factor (tCO ₂ MWh ⁻¹)	Fixed	Fixed	Fixed	Fixed
Borrow pits				
Number of borrow pits	0	0	0	Chapter 3: Description of Development. No borrow pit application will be included as part of this application
Average length of	0	0	0	Chapter 3: Description of

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
pits (m)				Development. No borrow pit application will be included as part of this application
Average width of pits (m)	0	0	0	Chapter 3: Description of Development. No borrow pit application will be included as part of this application
Average depth of peat removed from pit (m)	0	0	0	Chapter 3: Description of Development. No borrow pit application will be included as part of this application
Foundations and hard-standing area associated with each turbine				
Average length of turbine foundations (m)	16	16	16	Chapter 3: Description of Development
Average width of turbine foundations (m)	16	16	16	Chapter 3: Description of Development
Average depth of peat removed from turbine foundations(m)	0.71	0.639	0.781	See Technical Appendix 8-2: PMP. +/- 10% given for minimum and maximum value presented
Average length of hardstanding (m)	163	163	163	Chapter 3: Description of Development
Average width of hardstanding (m)	52	52	52	Chapter 3: Description of Development
Average depth of peat removed from hardstanding (m)	0.71	0.639	0.781	See Technical Appendix 8-2: PMP +/- 10% given for minimum and maximum value presented
Volume of concrete used in construction of the ENTIRE windfarm				
Volume of concrete (m ³)	2350	2350	2350	Chapter 3: Description of Development
Access tracks				
Existing track length (m)	0	0	0	Chapter 3: Description of Development
Total length of access track (m)	2021	1818.9	2223.1	Chapter 3: Description of Development. +/- 10% values are provided for maximum and minimum range
Total Width of access track (m)	6	6	6	Chapter 3: Description of Development
Length of access track that is floating road (m)	792.7	625.5	960	See Chapter 3: Description of Development and Appendix 8-2: PMP. +/- 10% given for minimum and maximum value presented
Floating road depth (m)	0	0	0	This parameter accounts for sinking of floating road. The Carbon Calculator states that it should be entered as the average depth of the road expected over the lifetime of the Proposed Development. If no sinking is

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
				expected, enter as zero. It is not anticipated that sinking of the floating track would be minimal and therefore this parameter has been set as zero for the expected and minimum values.
Length of floating road that is drained (m)	792.7	625.5	960	See Chapter 3: Description of Development and Appendix 8-2: PMP. +/- 10% given for minimum and maximum value presented
Average depth of drains associated with floating roads (m)	0.5	0.45	0.55	See Chapter 3: Description of Development and Appendix 8-2: PMP. +/- 10% given for minimum and maximum value presented
Average depth of peat on proposed track	0.75	0.675	0.825	Chapter 3: Description of Development. +/- 10% values are provided for maximum and minimum range
Floating road width (m)	6	6	6	See Chapter 3: Description of Development and Appendix 8-2: PMP.
Length of access track that is rock filled road (m)	0	0	0	Rock filled roads are assumed to be roads where no peat has been removed and rock has been placed on the surface and allowed to settle. This is not applicable for this site given the peat depths on site. See Appendix 8-2: PMP
Rock filled road width (m)	5	5	5	NA. Minimum value that Carbon Calculator allows is 5m
Rock filled road depth (m)	0	0	0	Rock filled roads are assumed to be roads where no peat has been removed and rock has been placed on the surface and allowed to settle. This is not applicable for this site given the peat depths on site. See Appendix 8-2: PMP
Length of rock filled road that is drained (m)	0	0	0	Rock filled roads are assumed to be roads where no peat has been removed and rock has been placed on the surface and allowed to settle. This is not applicable for this site given the peat depths on site. See Appendix 8-2: PMP
Average depth of drains associated with rock filled roads (m)	0	0	0	Rock filled roads are assumed to be roads where no peat has been removed and rock has been placed on the surface and allowed to settle. This is not applicable for this site given the peat depths on site. See Appendix 8-2: PMP
Cable Trench				
Length of any cable	0	0	0	All cable trenches within access

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
trench on peat that does not follow access tracks and is lined with a permeable medium (e.g. sand) (m)				tracks
Average depth of peat cut for cable trenches (m)	0	0	0	All cable trenches within access tracks
Additional peat excavated (not already accounted above)				
Volume of additional peat excavated (m ³)	0	0	0	Total includes substation and construction compound not already accounted for in the previous data lines. Temporary excavation values are not included See Technical Appendix 8-2: PMP. +/- 10% values are provided for maximum and minimum range
Area of additional peat excavated (m ²)	0	0	0	Total includes area (m ²) of the substation and construction compound not already accounted for in the previous data lines. Temporary excavation values are not included. See Technical Appendix 8-2: PMP. +/- 10% values are provided for the maximum and minimum range
Peat Landslide Hazard and Risk Assessments	Negligible	Negligible	Negligible	Fixed
Improvement of C sequestration at site by blocking drains, restoration of habitat, etc				
Area of degraded bog to be improved (ha)	16.46	16.46	16.46	See Technical Appendix 8.2: PMP Section 4.3.1
Water table depth in degraded bog before improvement (m)	0.3	0.1	0.5	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for degraded peat, reasonable estimated minimum, expected and maximum values are: 0.1m, 0.3m and 0.5m, respectively.
Water table depth in degraded bog after improvement (m)	0.1	0.05	0.3	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for intact peat, reasonable estimated minimum, expected and maximum values are: 0.05m, 0.1m and 0.3m, respectively.
Time required for hydrology and habitat of bog to return to its	15	10	40	Carbon calculator requires a value between 2 and 40 years. Due to uncertainty, 15 years chose for expected, 40 chosen as maximum

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
previous state on improvement (years)				and 10 chosen as minimum years for worst case.
Period of time when effectiveness of the improvement in degraded bog can be guaranteed (years)	40	40	40	Carbon calculator requires a value between 2 and 40 years. 40 years chosen as duration of consent.
Area of felled plantation to be improved (ha)	8.95	8.055	9.845	Please see Chapter 12 Forestry. As per the Windfarm Carbon Calculator Web Tool User Guidance, only the areas that will be felled and are designated for restoration to bog habitat were included. The carbon calculator does not allow the area of felled plantation to be improved (9.15ha) must be more than the area to be felled (8.95ha) therefore the closest amount to 9.15ha was entered.
Water table depth in felled area before improvement (m)	0.3	0.1	0.5	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for degraded peat, reasonable estimated minimum, expected and maximum values are: 0.1m, 0.3m and 0.5m, respectively.
Water table depth in felled area after improvement (m)	0.1	0.05	0.3	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for intact peat, reasonable estimated minimum, expected and maximum values are: 0.05m, 0.1m and 0.3m, respectively.
Time required for hydrology and habitat of felled plantation to return to its previous state on improvement (years)	15	10	40	Carbon calculator requires a value between 2 and 40 years. Due to uncertainty, 15 years chose for expected, 40 chosen as maximum and 10 chosen as minimum years for worst case.
Period of time when effectiveness of the improvement in felled plantation can be guaranteed (years)	40	40	40	Carbon calculator requires a value between 2 and 40 years. 40 years chosen as duration of consent.
Area of borrow pits to be restored (ha)	0	0	0	N/A. Borrow pits do not form part of this application.
Depth of water table in borrow pit before	0	0	0	N/A. Borrow pits do not form part of this application.

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
restoration with respect to the restored surface (m)				
Depth of water table in borrow pit after restoration with respect to the restored surface (m)	0	0	0	N/A. Borrow pits do not form part of this application.
Time required for hydrology and habitat of borrow pit to return to its previous state on restoration (years)	15	10	40	Borrow pits do not form part of this application. However, the carbon calculator requests that a value between 2 and 40 is entered. Carbon calculator requires a value between 2 and 40 years. Due to uncertainty, 15 years chose for expected, 40 chosen as maximum and 10 chosen as minimum years for worst case.
Period of time when effectiveness of the restoration of peat removed from borrow pits can be guaranteed (years)	40	40	40	Borrow pits do not form part of this application. However, the carbon calculator requests that a value between 2 and 40 is entered. 40 years chosen as duration of consent.
Water table depth around foundations and hardstanding before restoration (m)	0.3	0.1	0.5	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for degraded peat, reasonable estimated minimum, expected and maximum values are: 0.1m, 0.3m and 0.5m, respectively.
Water table depth around foundations and hardstanding after restoration (m)	0.1	0.05	0.3	The Carbon Calculator notes that water table depth should be measured on site. However, where site-specific values are not available, for intact peat, reasonable estimated minimum, expected and maximum values are: 0.05m, 0.1m and 0.3m, respectively.
Time to completion of backfilling, removal of any surface drains, and full restoration of the hydrology (years)	5	5	5	Carbon calculator requires a value between 0.1 and 5 years. 5 years chosen for worst case.
Restoration of Proposed Development Site after decommissioning				
Will you attempt to block any gullies that have formed due to the windfarm?	Yes	Yes	Yes	See Technical Appendix 8.2: PMP
Will you attempt to block all artificial	Yes	Yes	Yes	See Technical Appendix 8.2: PMP

Input date	Expected value	Minimum value	Maximum value	Source of Data (EIAR Volumes 2 & 3)
ditches and facilitate rewetting?				
Will you control grazing on degraded areas?	No	No	No	See Technical Appendix 8.2: PMP
Will you manage areas to favour reintroduction of species?	Yes	Yes	Yes	See Technical Appendix 8.2: PMP and Chapter 12: Forestry