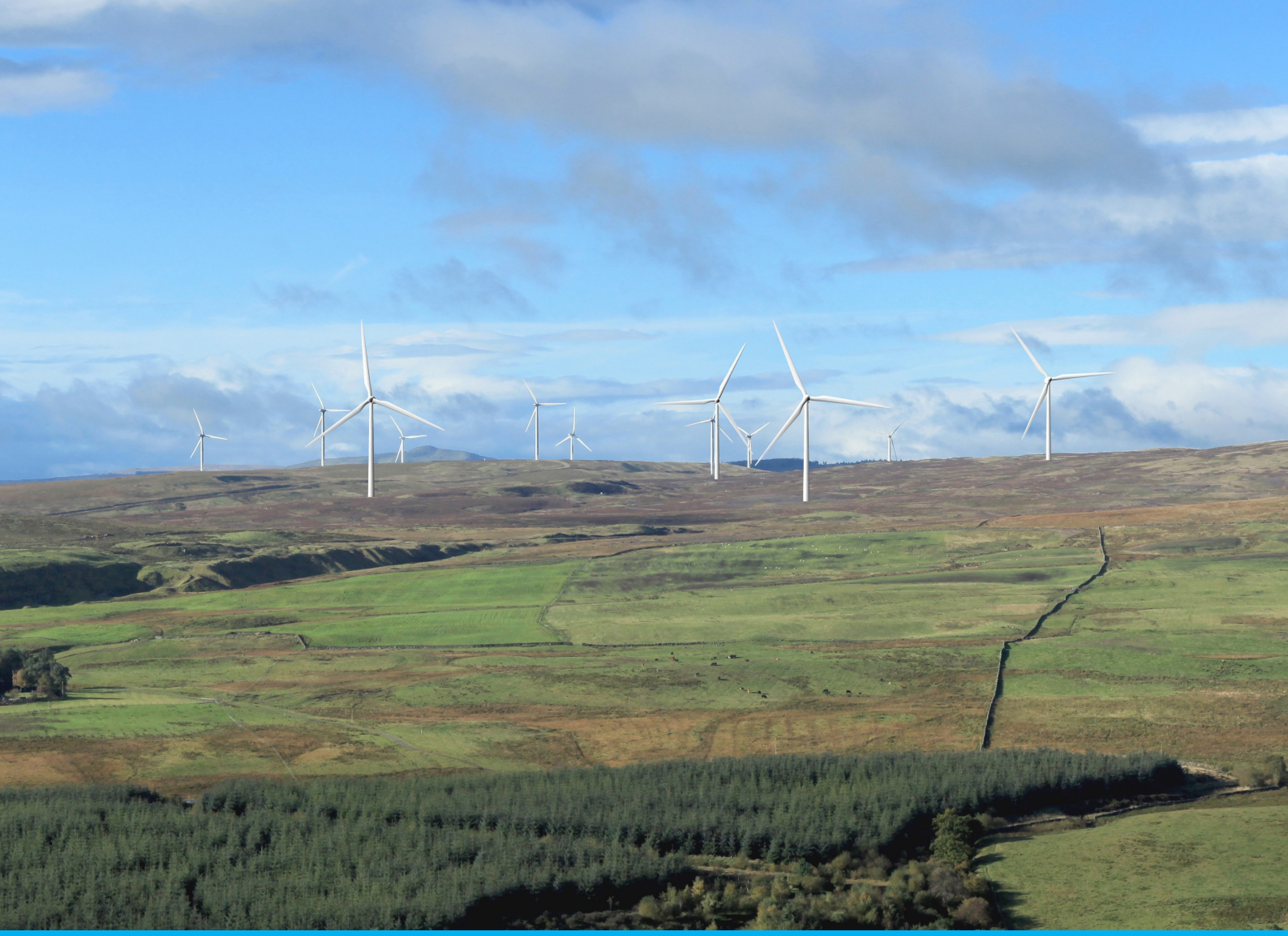

Drummarnock Wind Farm

Design and Access Statement

July 2024

Drummarnock Wind Farm Limited

wind2

atmos CONSULTING

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Version	Date	Reason
1.0	July 2024	Original Issue

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1 Introduction

This Design and Access Statement (DAS) has been prepared by Atmos Consulting Limited ('Atmos') on behalf of Drummarnock Wind Farm Limited ('the Applicant') to support an application for 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 Drummarnock Wind Farm ("The Proposed Development").

The Proposed Development consists of four wind turbines up to a maximum 180m tip height, and associated infrastructure including substation, control building and storage areas, new access tracks, turbine foundations and hardstandings, construction compound, underground cabling, borrow pits, and up to six watercourse crossings.

The Proposed Development Site is located in the Stirling Council (SC) area, approximately 10km south-west of Stirling, in the Fintry, Gargunnock and Touch Hills (the 'Proposed Development Site'). The Proposed Development Site is centred on National Grid Reference (NGR) (NS 74314 87247) and is illustrated in Figure 1-1.

The Proposed Development will have an indicative electricity export output of approximately 30MW.

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

The EIA Report presents the findings of the EIA process by describing the Proposed Development, the current conditions at the Proposed Development Site and the likely environmental effects which may result from the construction and operation of Proposed Development.

Where appropriate, mitigation measures designed to avoid, reduce or offset potentially significant effects are proposed and conclusions are presented on residual effects (those effects that are expected to remain following implementation of mitigation measures).

This Design and Access Statement does not form part of the EIA Report but should be read in parallel with it as many of the references in the Design and Access Statement refer to material produced in full in the EIA Report.

1.1 The Applicant

The Applicant, Drummarnock Wind Farm Limited, is a subsidiary of EDPR. Drummarnock Wind Farm is being developed by Wind2 on behalf of EDPR.

EDPR is a global leader in the renewable sector and the world's fourth-largest renewable energy producer. EDPR is currently present in the UK and internationally in another 27 markets.

EDPR has personnel based in Edinburgh and, through its joint venture with ENGIE (Ocean Winds), recently completed construction on the 950MW Moray East Offshore Wind Farm, which has the capability of supplying 40% of Scotland's electricity demand. Further information on EDPR can be found on its corporate website at https://www.edpr.co.en .

Wind 2 is a specialist onshore wind farm developer, founded in 2016. The company has staff based in the Highlands, Perth, Edinburgh, as well as Wales and in various locations throughout England, with significant expertise in renewable energy and a track record of successfully developing onshore wind farms throughout the UK.

Wind2 is working on the development of a number of renewable energy projects and is committed to investing in Stirlingshire. Further information on Wind2 can be found on its corporate website at https://wind2.co.uk.

1.2 Role and Purpose

The purpose of this Design and Access Statement is to set out the design principles and concepts that have been applied in relation to the Proposed Development. Consideration has been given to Scottish Government Planning Advice Note (PAN) 68: Design Statements (Scottish Government, 2003), which outlines the key principles and concepts to be considered within a design statement.

This DAS has been prepared in accordance with Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended, the' DMP Regulations') which sets out the detailed requirements of the content of a DAS in relation to planning permission.

A DAS is required in this case as the Proposed Development is classed as a 'Major Development', as it is a generating station with a capacity over 20 MW.

Regulation 13 of the DMP Regulations states that a design and access statement is a written statement which;

> *"(a) explains the policy or approach adopted as to design and how any policies relating to design in the development plan have been taken into account;*
>
> *(b) describes the steps taken to appraise the context of the development and demonstrates how the design of the development takes that context into account in relation to its proposed use; and*
>
> *(c) states what, if any, consultation has been undertaken on issues relating to the design principles and concepts that have been applied to the development and what account has been taken of the outcome of any such consultation."*

The DAS covers the following matters:

- Section 2: Policy Context;
- Section 3: Site Description and Context;
- Section 4: Site Selection and Design Evolution;
- Section 5: Final Design Overview;
- Section 6: Access; and
- Section 7: Conclusion.

2 Policy Context

2.1 National Planning Policy

National planning policy has been taken into account when designing the Proposed Development. The relevant national planning policy for the Proposed Development is as follows.

The Fourth National Planning Framework (NPF4)

NPF4 was approved on 13th February 2023 and is the national spatial strategy for Scotland (Scottish Government, 2023a). It sets out the principles for spatial development, defines national developments and regional priorities and sets out national planning policy.

NPF4 sets out significant and increased emphasis on the climate change and net zero agenda to bring together separate priorities and achieve sustainable development through three key themes: sustainable places, liveable places and productive places.

Part 1 of NPF4 will be supported by the planning and delivery of sustainable places; "where we reduce emissions, restore and better connect biodiversity". It sets out that:

> *"Scotland's future places will be net zero, nature-positive places that are designed to reduce emissions and adapt to the impacts of climate change, whilst protecting, recovering and restoring our environment."*

In terms of renewable energy generation, NPF4 states that:

> *"A large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets";*

and:

> *"Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas".*

It is clear within NPF4 that the generation of renewable energy is recognised as being of national importance as:

> *"significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets."*

NPF4 recognises that renewable energy generation through onshore wind farm development is a key part of the way in which the emissions reduction statutory outcome and the attainment of the legally binding net zero will be fulfilled. This can be afforded significant weight.

Policy 11e of NPF4 requires that project design and mitigation "*will demonstrate how …impacts are addressed*".

Table 1 provides details of impacts set out in Policy 11e, and of how the Proposed Development has considered these impacts.

Table 1:Summary of Proposed Development Design Considerations Against NPF4 Policy 11(e)

Potential Impact		Comment
i.	impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;	The design of the Proposed Development has taken into consideration landscape and visual impacts on residential amenity through the removal and relocation of turbines throughout the design evolution. The movement of turbine 2 (at design chill stage) also reduced residential amenity impacts on nearby properties. Proximity to noise sensitive receptors was also considered during the design evolution. Location of turbines have been sited to ensure no impacts from the result of shadow flicker.
ii.	significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable;	Potential landscape and visual effects associated with the Proposed Development were a consideration in the design evolution, to be balanced against onsite environmental and technical constraints and maximising wind yield. The scheme's relationship with the operational Craigengelt Wind Farm was an important consideration in the design evolution of the scheme also.
iii.	public access, including impact on long distance walking and cycling routes and scenic routes;	There are no core paths within the footprint of the Proposed Development. No core paths in the vicinity of the Proposed Development are expected to be affected by the Proposed Development. Details are included in Chapter 12 Section 12.4 including consideration of improvements to access.
iv.	impacts on aviation and defence interests including seismological recording;	The Proposed Development design has been extensively discussed with NATS to ensure no impacts on NATS radar. This has included removal and relocation of turbines (Layout 2 and 3; Interim Layout).
v.	impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;	Following consultation with telecommunication providers the layout was redesigned (pushing the overall layout north) and turbine numbers reduced from 5 to 4 in order to mitigate against aviation constraints (Layout 4; Interim Layout). At design chill stage and following further consultation with telecommunication providers turbine 2 was moved south east in order to mitigate against telecommunication constraints.
vi.	impacts on road traffic and on adjacent trunk roads, including during construction;	No significant impacts as a result of the Proposed Development.
vii.	impacts on historic environment;	The Proposed Development design has been based on consultation with HES at various stages of the EIA process. The horizontal spread of six turbines (Layout 2; Interim Layout) was reduced in order to reduce the horizontal field of view from sensitive receptors (including Stirling Castle) with the overall aim of producing a layout that lies within the horizontal field of view of the operational Craigengelt Wind Farm.

Potential Impact		Comment
		Following further consultation, turbine 6 was removed in order to address comments from HES on views from Stirling Castle (Layout 3; Interim Layout).
viii.	effects on hydrology, the water environment and flood risk;	Following peat, hydrology and Groundwater Dependent Terrestrial Ecosystem (GWDTE) assessment, turbines 1 and 4 were moved outwith deeper peat areas to reach design freeze.
ix.	biodiversity including impacts on birds;	With respect to ornithology, no constraints have been identified during the design phase that would necessitate any changes to the Proposed Development.
x.	impacts on trees, woods and forests;	N/A
xi.	proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;	N/A
xii.	the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans	N/A
xiii.	cumulative impacts.	Considered within each technical chapter as necessary. Aiming to keep the overall layout within the horizontal field of view of the operational Craigengelt Wind Farm from Stirling Castle.

2.2 Local Planning Policy

The adopted Local Development Plan (LDP) for the Proposed Development comprises:

- SC LDP (SC 2018); and
- Relevant supplementary guidance, including the SC Supplementary Guidance on Wind Energy Developments (2019).

SC Local Development Plan (2018)

The SC LDP was adopted in October 2018, setting out how the SC sees the Stirling LDP area developing over the next 10-20 years.

Primary Policy 12: Renewable Energy acknowledges that the Plan area;

> "…*has the potential to contribute to energy generation and storage tough most of the renewable and low-carbon technologies by permitting sensitively located development*".

Policy 12 goes on to state that all renewable energy developments which contribute towards Scottish Government energy targets; "…*will be supported where they comply with policies 12.1 or 12.2 (where appropriate) and with other relevant LDP policies*".

Policy 12.1: Wind Energy Developments sets out the following:

"(b) Developments will be permitted if they are of a scale, layout and nature such that adverse environmental impacts, including cumulative impacts, are avoided or minimised to the satisfaction of the planning authority.

(c) Proposals will also be assessed against the following criteria:

(i) Contribution to renewable energy generation targets and effect on greenhouse gas emissions.

(ii) Landscape and visual impacts.

(iii) Effects on natural heritage including wild land areas, the quality of the water environment and carbon rich soils.

(iv) Historic environment.

(v) Aviation and telecommunication interests.

(vi) Residential and community amenity.

(vii) Net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.

(viii) Public access, including impact on long distance walking and cycling routes and scenic routes identified in NPF.

(ix) Road traffic and adjacent trunk roads.

(x) Hydrology and flood risk.

(xi) Cumulative Impacts, arising from the above considerations.

(xii) The need for planning conditions relating to decommissioning and site restoration.

(xiii) Tourism and recreation interests."

SC Wind Energy Developments Supplementary Guidance (2019)

The SC Wind Energy Developments Supplementary Guidance (SC 2019) was produced in February 2019. The Proposed Development sits within the Spatial Framework Map for Onshore Wind Energy produced by SC in August 2016, illustrating that the Proposed Development Site is not located within either 'Group 1 Areas where wind farms will not be acceptable' or 'Group 2 Areas of Significant Protection'.

As such, it falls within Scottish Planning Policy (SPP) Group 3 Areas with potential for wind farm development, subject to detailed consideration against identified policy criteria.

It is noted, however, that the spatial framework was developed in accordance with SPP which is now superseded.

The Guidance is therefore considered to provide an indication of SC's view on the potential acceptability of wind energy developments in a particular area as opposed to a policy on the spatial approach to wind energy development.

The Proposed Development lies to the immediate north-east of the operational Craigengelt Wind Farm, for which SC provides the following guidance in relation to potential extension:

"Limited expansion of the Craigengelt development, of say 2-3 turbines closely related to the existing layout, may be capable of being absorbed into the area

without substantially altering the existing balance between developed and undeveloped areas."

Siting and Designing Wind Farms in the Landscape (2017)

NatureScot has produced guidance 'Siting and Designing Wind Farms in the Landscape' (NatureScot, 2017) that focuses on the assessment of landscape and visual impacts of wind farms, and informs wind turbine design, layout, and siting.

The guidance reflects an improved understanding of the main landscape and visual issues related to wind farm development and provides guidance on the appropriate turbine design parameters and siting wind farms in relation to landscape character and value.

Whilst it does not address technical design considerations or other natural heritage issues, which are also significant for siting and design, it has been used alongside national and local policies to inform and support decision-making elements of turbine siting and design evolution.

3 Site Description and Context

3.1 Site Description

The Proposed Development Site is located approximately 10km south-west of Stirling in the Fintry, Gargunnock and Touch Hills.

The land cover within the Proposed Development Site is predominantly marshy grassland in the eastern part, with the western part dominated by a mosaic of blanket bog, shrub heath and unimproved acid grassland. The Proposed Development Site is currently used for livestock grazing, including sheep and cattle, and for occasional grouse shooting.

The Proposed Development Site is centred on National Grid Reference (NGR) (approximate) NS 74314 87247 and is illustrated in Figure 1-1.

3.2 Surrounding Area

The Proposed Development Site features several watercourses, including the Loch Coulter Burn, the Bannock Burn and the Buckie Burn.

The settlement pattern in the wider area is characterised by scattered residences and farms with the nearest substantial settlement being the city of Stirling located approximately 3km north-east of the Site boundary at its closest point.

The nearest roads are an unclassified single-track road that runs south-west to north-east adjacent to the north-western boundary of the Site and an unclassified road that runs south-west to north-east adjacent to the south-eastern boundary of the Site. The M9 runs approximately north-south 3km north-east of the Site boundary at its closest point.

The closest commercial scale wind farm to the Site is the operational Craigengelt Wind Farm, located immediately adjacent to the south-west border of the Proposed Development Site. Beyond this, the operational Earlsburn and Kingsburn Wind Farms form a broad cluster between 2km and 7km west/north-west of the Site boundary, as illustrated on Figure 1-4.

Shelloch Windfarm Site is located approximately 7km west of the Site boundary. This was granted consent in 2015 but was not constructed at the time of the preparation of this DAS

The proposed Earlsburn Extension Windfarm would be located approximately 4km north-west of the Site. This development was the subject of an application under Section 36 of the Electricity Act 1989 (as amended) submitted to the Scottish Government's Energy Consents Unit (ECU) in December 2022 and is currently being determined (at the time of the preparation of this DAS.

3.3 Previous Application

The site has been subject to a previous planning application for a wind farm development of 11 wind turbines at 125m to tip height and associated infrastructure (Muirpark Wind Farm - Planning Application Reference: 09/00170/FUL) which was

submitted to Stirling Council in March 2009 and refused in March 2012 and not subject to appeal.

The reasons for refusal focussed on visual effects in relation to the nearby Lewis Hill; visual effects on the setting of Stirling Castle; visual effects relating to cumulative wind energy development and effects on the Kings Yett cairn.

The application boundary for the previous planning application covered the area occupied by the Proposed Development Site but also included land further north, with a total of five turbines located on that land.

The Proposed Development is therefore a significantly smaller scheme than the previous application (albeit with larger turbines) located at a greater distance from the assets listed above. Since the previous application there have also been significant changes to the cumulative context, national and local policy and the declaration of a Climate Emergency from UK/Scottish Government and Stirling Council.

3.4 Landscape Designations

The Proposed Development Site is situated within the locally designated Southern Hills Local Landscape Area (LLA).

There are a number of locally designated landscapes in the wider area (defined within the EIA Report, Chapter 5 Landscape and Visual Assessment) including the locally designated Denny Hills Special Landscape Area (SLA), Kilsyth Hills SLA, Campsie Hills LLA, Western Ochils and The Ochills LLA, Keir LLA, The Forest LLA, and Slamannan Plateau/Avon Valley LLA.

The Proposed Development Site does not fall within any nationally designated landscapes. Nationally designated landscapes within the wider area comprise the Trossachs National Scenic Area (NSA), Loch Lomond NSA and River Earn (Comrie to St Fillans) NSA; and Loch Lomond and the Trossachs National Park.

3.5 Heritage Designations

There are a number of designated heritage assets within the 10km Study Area defined within the EIA Report, Chapter 10 Cultural Heritage. Those designated heritage assets include Stirling Castle (SM90291), King's Yett, Cairn (SM2580),Dundaff Hill, Mound (SM6553) and Dundaff Hill, Enclosure (SM7131).

3.6 Ecology Designations

There are 12 environmental designations within 10km of the Proposed Development Site boundary which are summarised below:

- Carron Glen SSSI (2km SE from site boundary);
- Denny Muir SSSI (4km S from site boundary);
- Balquhidderock Wood SSSI (5km NE from site boundary);
- Endrick Water SSSI (6km W from site boundary);
- Endrick Water SAC (6km W from site boundary);
- Double Craigs SSSI (8km W from site boundary);
- Dullatur Marsh SSSI (9km S from site boundary);
- River Teith SAC (8km N from site boundary);

- Ochtertyre Moss SSSI (9km N from site boundary);
- Wester Moss SSSI (8km E from site boundary);
- Abbey Craig SSSI (9km NE from site boundary); and
- Firth of Forth SSSI (10km E from site boundary).

These are shown on Figure 1-3.

4 Site Selection and Design Evolution

4.1 Site Selection

The Proposed Development Site has been selected as suitable by the Applicant because it met the following criteria:

- There is a commercially viable grid connection;
- There is good wind speed;
- The Proposed Development location is in proximity to existing operational wind farms and is in an area where wind turbines are already operating at a reasonable distance from the Proposed Development Site;
- The Proposed Development Site is not located within a nationally designated area;
- The Proposed Development will generally be seen as a small modest extension to Craigengelt Wind Farm, as laid out in SC's Wind Energy Developments Supplementary Guidance (SC, 2019);
- The Proposed Development has the capacity to maintain suitable distance from the nearest residential properties and settlements; and
- The Proposed Development Site benefits from a good existing road network that has been previously used for the transportation of wind turbine components;

Site selection was informed by the spatial framework within Stirling Council's (SC) Wind Energy Developments Supplementary Guidance (SC 2019), with the Proposed Development Site lying within Group 3 of the Spatial Framework, Areas with Potential for Wind Farm Development.

4.2 Design Principles

In accordance Regulation 5(d) of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations'), reasonable alternatives (in terms of project design, technology, location, size and scale and characteristics) of the Proposed Development were considered.

As part of the development process the Applicant has reviewed and discounted alternative infrastructure siting (turbines, sections of new access track and access) due to a variety of factors including environmental, planning, technical and commercial constraints.

4.3 Design Consultation

Table 2 summarises consultation undertaken with key stakeholders specifically on the design of the Proposed Development, and how and where points raised have been addressed in this EIA.

Table 2:Summary of Design Consultation

Consultation Summary	How and Where has this been addressed
SEPA (Scoping September 2020) The site layout must be designed to avoid impacts upon the water environment.	• Embedded Mitigation is described in Chapter 8 Section 8.5. Embedded mitigation included the avoidance and minimisation of disturbance to sensitive hydrology and

Consultation Summary	How and Where has this been addressed
	hydrogeology receptors mainly water quality, peat and GWDTE. Sensitive design of water course crossings and 50m watercourse buffers wherever possible.
SEPA (pre-design freeze 2022) There are a couple of places where the new track appears to cross areas of peat identified as potentially greater than 1.5m deep. SEPA would need to know what type of peat this is, what condition it is on and whether it is part of a GWDTE. In the 2020 layout, a construction compound was marked in the southern section, On the peat depth map, tis correlates to a deeper area of peat. There is no indication in the 2022 Interpolated peat Depth map as to where the construction compound will be sited.	• Excavation of peat >1.0m in depth by infrastructure has been avoided with the exception of two very small pockets at Turbine 3 and one small point at Turbine 4. Details of peat disturbance are provided in the OPMP. • The construction compound is located on soil with no peat except for a small percentage. Its location is linked to the access track, and will be temporary. Its location is included on the interpolated peat Figure 8-3.
SEPA (pre-design freeze 2022) A map demonstrating that all GWDTE are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions.	Direct and indirect loss of potentially high groundwater dependent GWDTE was avoided as far as possible. This is clearly shown by comparison of the widespread occurrence of potentially highly groundwater dependent NVC and the significant avoidance shown on Figures 8- 8-5b. Specifically: • Turbine 2 was moved to reduce impacts on potential GWDTE; • Highly dependent M23 and M6 were generally avoided as they are within the 50m watercourse buffers where the M6 flushes and much of the rush pasture M23 typically occur; • One of the borrow pits in the centre of the Proposed Development Site was moved east to minimise deep peat and to avoid M23 rush pasture high dependency GWDTE; • The track close to WC5 was oved south to avoid disturbance of M35 Ranunculus omiophyllus - Montia fontana rill and associated rare moss.
SEPA (pre-design freeze 2022) There are many watercourses and flushes present on the proposed site. The GWDTE and flush areas marked on the map should be avoided by micro-siting infrastructure where possible. However, the eastern-most borrow pit appears to be within a flush habitat. Can it be moved?	See above.
Historic Environment Scotland	
HES (Formal Scoping Opinion - 23 October 2020) - expressed significant concerns about the potential adverse impact on Scheduled Monuments in the vicinity of the development site boundary. Potential cumulative impact of the proposed development should also be given particular attention in the assessment.	The final design of the Proposed Development has sought to avoid or minimise (as far as reasonably possible) effects to heritage assets (in consultation with key stakeholders). The design has been influenced by the reasons for refusal for a previous planning application within the Proposed Development Site. This included avoiding and minimising direct effects due to setting change to Stirling Castle and Kings Yett

Consultation Summary	How and Where has this been addressed
Specific heritage assets are Stirling Castle Stirling, Royal Gardens including King's Knot King's Yett, cairn 300m W of Dundaff Hill, mound 550m NE of summit Dundaff Hill, enclosure 950m NNW of Carron Bridge Bannockburn Inventory Historic Battlefield and Sauchieburn Inventory Historic Battlefield.	Cairn. Each iteration of the design has been reviewed to ensure that direct physical effects to known heritage assets are avoided. Similarly, how turbines will appear within the setting of heritage assets has been a key consideration in design refinements, including the number and location of turbines.
HES (post scoping consultation meeting 16/12/2020) - Stirling Castle was orientated with the vista in mind and the ridge on which Craigengelt sits is already at capacity with the existing turbines. Principal concerns are the western views from the Castle Height of the turbines and their position closer makes them more prominent than the existing turbines. Turbines 2,3 and 6 give concern from Kings Yett	The horizontal spread of the six turbines was reduced in order to minimise the horizontal field of view from sensitive receptors (including Striling Castle) with the overall aim of producing a layout that lies within the horizontal field of view of the operational Craigengelt Wind Farm.
Telecommunications/Aviation (Scoping Opinion Comments, 2020)	
Airwave/Motorola Solutions - identified that one turbine was anticipated to have an impact on two telecommunication links.	Design altered to remove infrastructure from the buffer zones associated from those links.
Arqiva - raised concerns about the distances of certain turbines to telecommunication buffers.	The Applicant consulted further with Arqiva confirming that they will not object to the Proposed Development on the basis that a planning condition is adopted to ensure suitable offset distances during construction.
BT - identified one telecommunication link in the vicinity of the Proposed Development and advised that two turbines would have an effect on the telecommunication link. Advised that they would object to the Proposed Development if the location of one turbine is not moved. BT were content that one turbine was suitably situated following Ofcom guidance.	The Applicant has designed the final layout to adhere to BT's requirements.
Ericsson - noted that a new telecommunication link had been installed, which crosses two turbines.	The Applicant consulted Ericsson who confirmed that this telecommunication link has been decommissioned and therefore the Proposed Development will have no impact on this telecommunication link.
MLL Telecom - identified a telecommunication link that was impacting on one of the turbines	The Applicant consulted with MLL and it was confirmed that the link was identified as being non-operational as a result, it is an anticipated that MLL will have no objection.
National Air Traffic Services (NATS) - the proposed development has been examined from an en-route infrastructure technical safeguarding perspective and the findings show that it will infringe NERL safeguarding criteria due to the proximity, physical size and relative orientation of the development.	The Proposed Development design has been extensively discussed with NATS to ensure no impacts on NATS radar this has included removal and relocation of turbines.

4.4 Design Evolution

The key constraints assessed during the design and Scoping process include:

- Landscape character and visual amenity;
- Ground conditions, topography and peat;
- Proximity to noise sensitive receptors;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of sensitive ecology receptors;
- Presence of sensitive cultural heritage features;
- Presence of telecommunication and aviation/radar constraints; and
- Proximity to suitable grid connection.

These constraints are discussed in detail in the relevant chapters of the EIA Report.

Table 3 summarises the key design iterations that have taken place including pre-application and scoping layout, interim designs, design chill and design freeze. The Design Evolution Layouts are shown on Figure 3-2 (a-b).

Table 3: Turbine Layout Design Iterations

Layout	Turbines	Tip Height (m)	Design Changes
1; Pre-app and Scoping Layout	6	149.9m	Initial Feasibility layout based on preliminary environmental and technical consideration including distance from neighbouring schemes, residential properties, cultural heritage assets, telecommunication links, radar (in consultation with NATS), watercourses and topography.
2; Interim layout	6	149.9m	Layout refined based on further information from survey works - primarily phase 1 peat surveying and ecological habitat surveys. Following consultation with Historic Environment Scotland (HES) the horizontal spread of the six turbines was reduced in order to reduce the horizontal field of view from sensitive receptors (including Striling Castle) with the overall aim of producing a layout that lies within the horizontal field of view of the operational Craigengelt Wind Farm. Ongoing consultation with NATS to ensure layout was acceptable from a radar perspective.
3; Interim Layout	5	149.9m	Following further consultation, turbine 6 was removed in order to address comments from HES on views from Stirling Castle and to mitigate potential effects on residential amenity on nearby properties (Easter Cringate Cottage and Ryecroft). Ongoing consultation with NATS to ensure layout was acceptable from a radar perspective.
4; Interim Layout	4	180m	Following consultation with telecommunication providers the layout was redesigned (pushing the overall layout north) and turbine numbers reduced from 5 to 4 in order to mitigate against aviation constraints and to maximise site efficiency. The turbine tip height was increased in order to achieve project commercial viability given reduction in turbines. Agreement with NATS on the acceptability of the layout from a radar perspective.
5. Design Chill	4	180m	Following further consultation with telecommunication providers turbine 2 was moved south east in order to mitigate against telecommunication constraints. The movement of turbine 2 also reduced residential amenity impacts on nearby properties and reduced impacts on potential Groundwater Dependent Terrestrial Ecosystems (GWDTE). Ongoing consultation with NATS to ensure layout was acceptable from

Layout	Turbines	Tip Height (m)	Design Changes
			a radar perspective.
5: Design Freeze	4	180m	Following further peat, hydrology and GWDTE assessment turbines 1 and 4 were moved outwith deeper peat areas. Various options for the location of turbine 2 were considered with the location chosen balanced against technical and environmental constraints whilst aiming to keep the overall layout within the horizontal field of view from of the operational Craigengelt Wind Farm from Stirling Castle. Confirmation from NATS that design freeze layout is acceptable from a radar perspective.

5 Final Design Overview

The Proposed Development consists of four turbines up to a maximum 180m tip height, and associated infrastructure.

The associated infrastructure includes:

- New access tracks;
- Construction of turbine foundations, crane hardstandings and storage areas;
- Underground cabling;
- One onsite substation which would accommodate 33KV equipment to collect electricity from the site. The substation compound would include a control and metering building;
- Construction compound;
- Up to four borrow pits; and
- Up to six watercourse crossings.

The Proposed Development includes the provision for 6.59km of new access tracks, which includes two onsite access options (Option A and Option B). However, only one of these onsite access options will be constructed, and therefore of the 6.59km of proposed new tracks, a maximum of up to 5.8km would be constructed, dependent upon the access option utilised. To ensure a robust and conservative assessment, the EIA has assessed the full 6.59km to support the full appraisal of both access options.

All infrastructure has been sited in areas of appropriate topography, to avoid areas of deep peat and sensitive habitats as far as possible, and to minimise the effects on heritage assets and residential properties.

The wind turbines have an indicative output of approximately 30MW.

The Proposed Development has been designed with an operational life of 40 years, at the end of which it will be decommissioned unless further consent is granted.

The Proposed Development components are summarised in Table 3-3 in Chapter 3 Description of Development. "Permanent Infrastructure" in the context of this EIAR means infrastructure that will be in place for the operational life of the Proposed Development.

Following expiry of planning permission, the decommissioned above ground infrastructure will be removed and reinstated in an environmentally sensitive way agreed with statutory consultees.

Once the turbines have been installed, the access tracks and hardstand areas around the turbines will remain in place as permanent infrastructure.

6 Access

6.1 Proposed Development Site Access

Turbine components are expected to be delivered via the port of Grangemouth. The components will be transported by road via a series of abnormal loads movements (the turbine blades, tower sections and nacelle are classified as abnormal loads due to their size) to the Proposed Development Site access point.

The route for delivery of turbine components to the Proposed Development Site is likely to be from Junction 9 of the M9. The proposed route would take the A872 northbound onto the Pirnhall Road, before passing south over the M9 on the New Line Road, and travelling along approximately 6km of minor roads to reach one of the two points of entries presented in the EIA for the Proposed Development .

Site access is discussed further in Chapter 9 Transport and Access.

6.1.1 Access Track

The Proposed Development includes the provision for 6.59km of new access tracks, which includes two onsite access options (Option A and Option B). However, only one of these onsite access options will be constructed, and therefore of the 6.59km of proposed new tracks, a maximum of up to 5.8km would be constructed, dependent upon the access option utilised. To ensure a robust and conservative assessment, the EIA has assessed the full 6.59km to support the full appraisal of both access options.

New Access Track

A maximum of up to 5.8km of new access track (based on the site access associated with the longest total length of track) will be constructed to the specification required by the wind turbine supplier, typically with a running width of 5m in straight sections, increasing at bends, passing places and junctions.

The tracks will be designed to have sufficient radii for turning of the construction vehicles, abnormal loads and associated plant. The access tracks have been designed to avoid sensitive features.

The access tracks will be constructed using 'cut track' design. Topsoil is stripped to expose a suitable rock or sub-soil horizon on which to build the track. Subject to final design by a qualified contractor, the track might consist of granular material layers.

Generally, the surface of the track will be flush with or raised slightly above the surrounding ground level.

Where the presence of peat has been identified to be greater than 0.5m in depth, floating tracks are proposed to be used (where gradients allow and where lengths and cut and fill requirements do not preclude their construction). Layers of crushed stone (depth dependant on ground conditions) will be laid on geotextile/geogrid reinforcement to form the track, which results in the site track being raised above the peat surface.

An indicative track construction design is shown in Figure 3-7.

Soils removed from the excavated area will be stored separately in piles, no greater than 3m in height, directly adjacent to, or near the tracks on ground appropriate for storage of materials i.e., relatively dry and flat ground, a minimum of 50m away from any watercourses. Wherever possible, reinstatement of ground disturbed to facilitate construction of the track will be carried out as track construction progresses.

Prior to the commencement of site construction, detailed engineering specification for the access track design will be submitted to the planning authority as part of a Planning Conditions Compliance Statement, which will include Construction Method Statements for all aspects of construction.

Access Track Drainage

The drainage design will comply with General Binding Rules (GBR's) 10, 11 and 21 for the track drainage, under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended) (Scottish Environment Protection Agency (UK Government, 2021).

Consideration of Alternatives

The preferred on-site track routes have been designed to allow access to the turbine locations taking environmental constraints into account.

The proposed onsite access routes are intended to minimise impacts on sensitive receptors by avoiding areas of deep peat and GWDTE where possible, minimising the effects on heritage assets, heritage constraints and limiting the number of water crossings required.

Public Access

There are no paths within the footprint of the Proposed Development Site, therefore no walking routes will be disrupted by the construction of the Proposed Development.

The Applicant is currently exploring options to enhance opportunities for pedestrian access and recreation, via the creation of a connection from the minor road located to the north-west of the Proposed Development to the Proposed Development access tracks.

The Applicant is committed to providing and maintaining public access to the access track network, via the provision of waymarked trails, signage and interpretation boards as appropriate.

6.1.2 Watercourse Crossings

The Proposed Development has been designed to minimise construction works in the vicinity of mapped watercourses and to minimise the need for new water crossings in order to reduce the risk of pollution and changes to watercourse morphology.

Dependent on what onsite track option is constructed, up to six new watercourse crossings (visible on OS 1:25,000 mapping) will be required for the proposed new access tracks within the Proposed Development Site, these locations are shown in Figure 3-1 (a) and summarised in Table 4.

The watercourse crossings will be designed in accordance with relevant guidance (WAT-SG-25), and designed to accommodate 1 in 200-year events. Figure 3-8 shows a typical indicative bottomless culvert design.

It is worth noting that should access Option A be constructed, WC1 would not be required. Similarly, should access Option B be constructed, WC6 would not be required.

Table 4: Major Watercourse Crossing Summary

Crossing ID	Easting	Northing	Proposed Crossing Type
WC1	275909	687137	New crossing
WC2	275198	687304	New crossing
WC3	275130	687346	New crossing
WC4	274491	687452	New crossing
WC5	274181	687337	New crossing
WC6	275775	687900	New crossing

6.1.3 Construction Programme

Subject to receipt of planning permission and discharge of pre-commencement conditions; construction works are anticipated to commence in 2026 with a total duration estimated at approximately 12 months. The work will proceed in four phases as summarised in Table 5.

Table 5: Construction Programme

Phase	Summary of Works
Phase 1 (months 1 and 2); Enabling/Access Works;	Construction of new access routes from existing access tracks to the turbine locations.
Phase 2 (month 3 to 10); Development (Main Site)	Establishment of site facilities, turbine foundation and turbine cabling. Delivery of turbine components & installation with cranes.
Phase 3 (month 10 to 12); Commissioning	Testing and commissioning equipment and turbines.
Phase 4 (month 12); Reinstatement and Restoration	Removal of temporary facilities and re-instatement of temporary working areas. Restoration of working areas as set out in the Schedule of Mitigation and CEMP.

The proposed normal hours of operations for construction activity are between 07:00 - 19:00 Monday to Friday, and 07.00 – 13.00 on Saturdays. During construction and installation, there may be a requirement for extended working hours as some critical elements of installation cannot be stopped once started such as concrete pouring, this will be agreed in advance with SC.

7 Conclusion

This document provides an overview of the design process undertaken by the Applicant.

The careful placement of the proposed turbines and associated infrastructure within the Proposed Development Site has facilitated effective mitigation to reduce the potential for significant effects through the design process.

This document has described the principles that have shaped and influenced the design of the Proposed Development and how issues of access have been addressed.

The Proposed Development has undergone numerous iterations taking into account feedback from statutory consultees and the local community. This has resulted in a development which is sympathetic to the local landscape and environmental sensitivities.

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