1 INTRODUCTION

1.1.1 SSE Generation Limited ('the Applicant') has applied for consent[1] to construct and operate a generating station incorporating up to 12 Wind Turbine Generators (WTGs) of up to 180 m tip height, battery energy storage system (BESS) and associated infrastructure with generation capacity of greater than 50 MW. The project is to be referred to as Glentarken Wind Farm ('the Proposed Development'). The 'Site' (defined by the red line boundary on **Figure 1** of this NTS)is located approximately 45 km west of Perth within the Drummond Estate and approximately 2.8 km east of Lochearnhead, Stirling, Scotland.

1.1.2 The Environmental Impact Assessment Report (EIAR) has been prepared to accompany an application to Scottish Ministers under Section 36 of the Electricity Act 1989[2]. The EIAR has been prepared in accordance with *The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended)* (the 'EIA Regulations'). The EIAR has been prepared to meet the requirements of Schedule 4 of the EIA Regulations and the Institute of Environmental Management and Assessment (IEMA) Quality Mark Criteria.

1.1.3 This document provides a Non-Technical Summary (NTS) of the EIAR, as required by the EIA Regulations.

1.1.4 The EIAR comprises of the following volumes:

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

1.1.5 The Application is accompanied by the following documents that do not form part of the EIAR:

Planning Statement;
Design and Access Statement;
Pre-Application Consultation Report; and
Economic and Community Impact Report

1.2 Purpose of the Non-Technical Summary

1.2.1 The purpose of the NTS is to summarise the context and findings of the EIAR. The NTS provides a clear and concise summary of technical elements of the EIAR to assist the public in understanding what the likely significant environmental effects of the Proposed Development are, how such effects have been reduced where possible and any mitigation of effects proposed.

1.2.2 Further details are provided within the various technical chapters (**Volume 1**) and associated Technical Appendices (**Volume 4**) of the EIAR.

1.3 Copies of the EIAR

1.3.1 Hard copies of the EIAR will be made available for viewing at St Fillans Village Store[3].

[1] An application for consent for the Proposed Development will be made to the Scottish Ministers under section 36 of the Electricity Act 1989, along with a request for a direction that planning permission be deemed to be granted under section 57(2) of the Town and Country Planning (Scotland) Act 1997

[2] Electricity generation projects below 50MW are authorised under the Town and Country Planning (Scotland) Act 1997. Those over 50MW are authorised under Section 36 of the Electricity Act 1989

[3] Main St, St Fillans, Perth and Kinross, PH6 2ND

1.3.2 This EIAR, including all figures, technical appendices and accompanying documents are available to view and download on the project website (https://www.sserenewables.com/onshore-wind/in-development/glentarken/) free of charge.

1.3.3 The application documents will be available via the Scottish Government Energy Consents Unit portal www.energyconsents.scot and Perth and Kinross Council (PKC) planning portal https://www.pkc.gov.uk/publicaccess.

1.3.4 The Applicant will work closely with the Energy Consents Unit (ECU) to ensure all statutory consultees receive a physical copy of this EIAR upon request.

1.3.5 In the interests of sustainability, reference to the paperless (project website/ ECU/ PKC planning portal) version is strongly recommended. For anyone who has difficulty accessing the documentation online, copies of the EIAR may be obtained from SSE Generation Limited (contact: SSE Generation, FAO Karen Anderson, 1 Waterloo Street, Glasgow, G2 6AY or karen.anderson@sse.com) at a charge of £850 for a hard copy, or on electronic USB or DVD copies free of charge. Copies of this Non-Technical Summary are also available free of charge.

1.4 Commenting on the Application

1.4.1 When the application for the Proposed Development is lodged with Scottish Government the applicant will advertise in local and national press in accordance with legislation as follows:

A local newspaper for two successive weeks;
a national newspaper for one week;
the Edinburgh Gazette for one week; and
on the Developers' application website at: sserenewables.com/Glentarken

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

1.4.3 Any representations in relation to the application should be made to the Energy Consents Unit mail box, at representations@gov.scot, or by post to The Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU. They should identify the Proposed Development and specifying the grounds for representation. Written or emailed representations should be dated, clearly stating the name (in block capitals), full return email and postal address of those making representations.

2 EIA Process

2.1 Scoping

2.1.1 The Applicant submitted a request for a Scoping Opinion to Scottish Ministers in December 2022[4]. This request was accompanied by a Scoping Report, prepared by the Applicant, which set out a summary of the proposals; identified the likely significant environmental effects, and summarised the proposed scope of the EIA.

2.1.2 The Scoping Report was simultaneously issued to a list of statutory and non-statutory consultees. A Scoping Opinion was received from ECU on 22nd February 2023 (ECU Reference ECU00004700)[5].

2.1.3 The scoping process allowed the EIA to focus on the main areas of interest raised by the various consultees. It was agreed that impacts which are not likely to result in significant effects could be scoped out of further assessment.

2.2 Public Consultation

2.2.1 In addition to seeking a Scoping Opinion, the Applicant conducted three sets of public exhibitions to seek the views of the local community and build awareness of the project. These initial public exhibitions were held in St Fillans on 19th April and in Lochearnhead on 20th April 2023. A second round of public exhibitions were held in St. Fillans on the 28th May 2024, and Lochearnhead on 29th May 2024. A third round of exhibitions, following design freeze ahead of submission were held in St Fillans on the 19th November and in Lochearnhead on 20th November 2024. Virtual exhibitions were also hosted in alignment with each set of events on 2nd and 4th May 2023, 12th June 2024, and 28th November 2024.

2.2.2 Throughout the consultation, the Applicant has written on more than one occasion to four local community councils (St Fillans, Balquidder Lochearnhead & Strathyre, Killin and Comrie). Formal meetings took place with St Fillans in May and August 2023 and May 2024 and with Balquidder Lochearnhead & Strathyre in April 2023 and July 2024. A presentation was provided to Killin Community Council on Tuesday 5th November 2024 and similar engagement has been offered to Comrie Community Council.

2.2.3 Details of all feedback received during the public exhibition event and community council meetings is provided within the Pre-Application Consultation (PAC) Report submitted as a supporting document to this EIA Report.

2.3 EIA Methodology

2.3.1 EIA is a process that identifies the potential environmental effects (both adverse and beneficial) of a Proposed Development and proposes mitigation to avoid, reduce and offset any adverse environmental effects.

2.3.2 The Proposed Development is of a type listed in Schedule 2 of the EIA regulations (item (1) “a generating station”). On the basis that “the development is likely to have significant effects on the environment by virtue of factors such as its nature, size or location” it is considered an “EIA development”. In this case, the Applicant has volunteered to undertake an EIA rather than request a formal screening opinion.

[4] At the time of Scoping, the Proposed Development was referred to as Drummond Wind Farm.

[5] Energy Consents Unit (2023) Glentarken Wind Farm Scoping Opinion Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004700

2.3.3 The EIA begins with identifying baseline conditions, which involve understanding the environmental state of the site both now and in the future, presuming no development occurs. This is determined through desk research, site surveys, empirical studies, and future projections. Based on this, the EIA assesses the likely significant environmental effects of the Proposed Development against the current environmental conditions.

2.3.4 Following the baseline characterisation, alternative designs are considered with a focus on reducing environmental impact while optimizing the design of the site from an engineering perspective. This 'mitigation by design' is an iterative and informed process that aims to avoid, reduce, and offset any significant environmental effects. Further details on the design process adopted for the Proposed Development are set out within **Chapter 3: Design Evolution and Alternatives (EIAR Volume 1).**

2.3.5 The impact assessment evaluates any likely significant environmental effects that are likely to remain after implementation of mitigation by design and /or best practice measures. This includes examining direct, indirect, and cumulative effects across various phases of the Proposed Development, with each aspect being detailed in its respective technical chapter in the EIAR.

2.3.6 If any likely significant effects cannot be avoided through design or best practices, additional mitigation measures are identified. Mitigation has been considered following a hierarchy of first seeking to avoid effects, followed by seeking a reduction in effects to levels not considered significant, and finally where necessary and possible, offsetting, or compensatory measures are considered. Detail of these processes is provided in the EIAR in each technical chapter and **in Chapter 15 of EIAR Volume 1 (Summary of Effects and Schedule of Mitigation)**.

3 Project Need and Benefits

3.1.1 On 28th April 2019, Scotland's First Minister declared a climate emergency. Following this declaration, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 ("the 2019 Act") was passed by the Scottish Parliament to amend the Climate Change (Scotland) Act 2009. The 2019 Act commits Scotland to reducing its greenhouse gas emissions to net-zero by 2045 at the latest. This compares with the UK Government target of net-zero by 2050.

3.1.2 If constructed, the Proposed Development will play an important part in helping the UK meet its climate goals and ending reliance on volatile energy markets, providing more secure homegrown energy.

3.1.3 Further details on the statutory and policy framework are provided in **Chapter 4: Planning and Energy Policy (EIAR Volume 1**) and the supporting Planning Statement.

3.1.4 The project would bring socio-economic benefits (refer to **Chapter 12 Socio-economics, Recreation and Tourism, EIAR Volume 1**) to the local community, including the creation of jobs and opportunities for local businesses and suppliers during the construction phase and for the lifetime of the project. A community investment fund will be established for Glentarken Wind Farm valued at £5,000 per MW installed wind energy capacity per year and index linked to CPI. The funding will be available once main construction starts and will remain in place for the operational life of the project. In addition, the Applicant is committed to open discussions about community ownership, should there be interest in pursuing it, for the Proposed Development. This application, therefore, not only complies with Scottish Government planning and energy policy, but would also lead to increased benefits both in respect of climate change, as well as local economic benefits.

4 Proposed Development

4.1.1 The Proposed Development would comprise of up to 12 turbines and associated ancillary infrastructure, as illustrated on **Figure 2.1: Site Layout.** The Proposed Development would include the following key permanent components:

Up to 12 WTGs of up to 180 m tip height with internal transformers;
Turbine foundations;
Battery Energy Storage Systems (BESS) with up to 50 MW capacity;
Crane hardstanding and associated laydown area at each WTG location;
Approximately 15.6 km of on-site access tracks comprising 11.8 km of cut track, 2.8 km floated track and 1 km of upgraded existing track, to connect to ancillary site infrastructure;
An on-site substation, operations and control building ,welfare building and store;
A network of underground cabling to connect each WTG to the on-site substation;
Watercourse crossings;
Telecommunications infrastructure
A LiDAR unit to collect meteorological and wind speed data, and associated hard stand; and
Any other ancillary works required.

4.1.2 In addition to the permanent components, the construction phase would comprise the following temporary facilities:

Site compound areas, including welfare facilities, site cabins, storage, and parking;
Batching plant facilities for temporary on site concrete batching;
Up to six borrow pits; and
Any other ancillary works required.

4.2 Construction Activity

4.2.1 The estimated construction period of the Proposed Development is approximately 18 months. This period is indicative only and may be subject to variation as a result of factors which include, but are not limited to, weather restrictions, ground conditions encountered through detailed investigation, turbine component and material delivery, timing of grid connection works and public highway constraints. However, this is considered to represent a realistic worst case for the purposes of the assessment.

Hours of Work

The normal working hours will be as follows:

Monday to Friday 0700-1900;
Saturday 0700-1400; and
no working on Sundays or public holidays without prior written approval from PKC.

4.2.2 No works, except for turbine delivery, the completion of turbine erection and commissioning or emergency work, will take place outside these hours, and any such out-of-hours works will be subject to prior agreement with PKC. The requirement for out-of-hours work could arise, for example, from delivery and unloading of abnormal loads or health and safety requirements, or to ensure optimal use is made of fair weather windows for the erection of turbine blades and the erection and dismantling of cranes.

Construction Traffic and Plant

4.2.3 During the construction period a range of vehicles will be accessing the Site at the A85 junction, including flat-bed trucks and Heavy Goods Vehicles (HGVs) delivering plant and machinery (such as excavators,

Moxy dump trucks, bulldozers and cranes) as well as smaller cars and vans associated with construction staff movement and equipment.

4.2.4 A Traffic Management Plan (TMP) would be agreed in consultation with PKC and Transport Scotland. This would address the scheduling, routing, and overall management of abnormal loads movements along with the programming and management of all other HGV movements.

4.3 Construction Environmental Management Plan (CEMP)

4.3.1 The main objective of CEMP is to provide information on appropriate measures in the avoidance, minimisation and control of adverse, environmental impact associated with the works. The CEMP aims to define good practice as well as specific commitments relating to environmental protection as identified in the EIAR.

4.3.2 An Ecological Clerk of Works (ECoW) will be appointed by the Employer to monitor compliance of ecological provisions of the CEMP over the duration of the works.

4.3.3 The CEMP is currently in outline format (**Technical Appendix (TA) 2.1, EIAR Volume 4**), setting out standard mitigation measures to address the temporary effects associated with construction. Prior to the commencement of development, following baseline surveys undertaken in accordance with the EIAR, the CEMP will be developed to include specific protection and monitoring plans relevant to the construction period.

4.4 Operation and Maintenance

4.4.1 The expected operational life of the Proposed Development is 50 years from the date of commissioning. Routine maintenance, inspections and servicing would be carried out as required, including major component and blade inspections, and following any unexpected events on site, such as generator or gearbox failure. Control systems would normally manage optimal generation performance for turbines, this includes start-up, shut-down, rotor direction, blade angles etc. and to monitor equipment condition. The control systems would automatically shut the turbine or battery down should the need arise.

4.4.2 Track maintenance would be dependent on the volume and nature of site traffic and weather conditions. Safe access and management of silt run off would be maintained throughout the year as required. There would be no public vehicle access to site.

4.5 Residues and Emissions

4.5.1 The EIAR has considered the potential for residues and emission associated with the construction and operation of the Proposed Development. As required by the EIA Regulations, this includes consideration of: water; air; soil and subsoil; noise and vibration; light; heat and radiation; and waste. With the implementation of the CEMP, no significant residues or emissions have been identified during the construction phase. No significant residual effects from residues or emissions would result from the operation of the Proposed Development.

5 Design Evolution and Alternatives

5.1 Site Selection and Design Process

5.1.1 A key, early phase of the site selection process is identifying whether a site is feasible to develop a wind farm. The Site must exhibit favourable wind conditions such as consistent, strong winds and in the correct direction. It is also essential that the site location has access to the existing power grid, ensuring the efficient transmission of generated electricity with minimal infrastructural modifications. Areas designated for natural heritage protection or those noted for their high landscape or scenic quality, are a key consideration. Accessibility is another critical factor; the site should be readily accessible via existing road networks to facilitate the transport of materials and equipment, and also for future maintenance operations. These preliminary assessments are key in identifying a site that aligns with technical, environmental, and logistical requirements.

5.1.2 Consistent with renewable energy policy, the key overall objective is to maximise the energy generation potential of the Site, whilst ensuring the protection of sensitive environmental receptors. A design process and brief was agreed with the team which included key parameters such as preliminary technical engineering turbine layout; land availability; and requirements for construction activity and infrastructure.

5.1.3 The environmental issues for consideration in the design process were identified following a baseline characterisation of the Site. Recommendations for how environmental constraints should be addressed in the design process were made in relation to each technical topic. Issues were considered through design with the aim of 'designing out' significant effects. Where it is not possible to mitigate by design, the issues have been considered further as part of the EIA. Further details are provided in **Chapter 3 (EIAR Volume 1).** The design freeze layout and key environmental constraints are illustrated on **Figure 3** of this NTS.

6 Layouts Considered

6.1.1 Six Site layouts were assessed as shown in **Figure 4: Design Evolution.** Layout 6 was selected as the best balance of addressing environmental impacts whilst being commercially ensuring significant renewable energy generation. The main environmental reasons for selecting layout 6 include:

The reduced impact on areas of deep peat,
The provision of a unified layout from a landscape and visual perspective, and the
The reduced impact on priority peatland habitats habitat.

6.1.2 The proposed layout provides an optimised layout from an environmental and construction perspective, with has been chosen as likely significant effects being avoided or minimised as far as reasonably practicable.

7 Summary of Potential Environmental Effects

7.1.1 The EIA process is designed to identify the likely significant effects that the Proposed Development could have on the environment and where it has been possible, set out how they have been reduced or mitigated. The EIA considered the environmental impacts across a range of factors, in accordance with the EIA Scoping Opinion issued by Scottish Ministers (ECU Reference ECU00004700)[6] . Likely significant effects, in EIA terms, were identified in respect of several topics (see list below, each of which topics is detailed in a Chapter of the EIAR, Volume 1)) in absence of mitigation measures. However, the EIA concludes that the likely significant effects would be reduced, in respect of all but one of the topics, to a non-significant level through the application of mitigation measures. The only exception is for the Landscape and Visual Impact Assessment (LVIA), in respect of which significant (localised) residual effects would be likely to remain.

Landscape and Visual;
Ornithology;
Ecology;
Geology, Peat, Hydrology and Hydrogeology;
Noise and Vibration;
Cultural Heritage
Traffic, Transport and Access;
Socioeconomics, Recreation and Tourism;
Aviation; and
Television and Radio.

7.2 Landscape and Visual

7.2.1 The LVIA **Chapter 5, EIAR Volume 1,** has identified that the significant landscape and visual effects of the Proposed Development are found within an area relatively local to the Site and surrounding context of the Study Area. The area in which the turbines and majority of infrastructure are located is not subject to any landscape planning designation and would be contained within a large-scale upland landscape, minimising the effects on nearby designated landscapes to the north, south and west.

7.2.2 Significant landscape character effects are assessed to occur within a maximum of 12 km from the nearest turbine of the Proposed Development. Significant visual effects have been identified as occurring out to a range of approximately 16 km from the nearest turbine of the Proposed Development. The Proposed Development turbine layout has been designed to minimise effects on the surrounding straths and glens in the Study Area and as a result, the extent of visibility in these lower lying parts of the Study Area is minimal. This has led to a marked reduction in landscape and visual effects across the lower lying parts of the Study Area, including within the straths and glens of nearby National Scenic Areas and the Loch Lomond and the Trossachs National Park (LLTNP) and along the key routes that connect these sensitive landscapes and serve as a gateway to the LLTNP.

7.2.3 As a result, **the significant landscape and visual effects** found in the LVIA are **largely limited** to elevated parts of the Study Area for high sensitivity receptors. Photomontages and wirelines of the 22 Landscape and Visual viewpoints are provided in **Figures 5.17a – 5.42c (EIAR Volume 3)**.

7.2.4 When compared with other wind farm developments of this scale, the level of limitation of effects on lower lying areas of the surrounding landscape is notable and illustrates the positive influence of the landscape and visual design mitigation embedded in the Proposed Development design strategy and that significant effects on landscape character and visual amenity are relatively localised in nature.

[6] Energy Consents Unit (2023) Glentarken Wind Farm Scoping Opinion Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004700

7.3 Ornithology

7.3.1 Baseline conditions to inform the design and assessment of the Proposed Development have been established through a desk study and ornithological field surveys in accordance with industry standard guidance and in consultation with nature conservation bodies and specialist species recording groups.

7.3.2 The Site does not form part of any statutory designated site for nature conservation with qualifying ornithological interests or lie within potential connectivity distances to any Special Protection Area (SPA).

7.3.3 Baseline studies have established that the Site and adjacent habitats are used by foraging and breeding raptors (notably golden eagle, merlin, and red kite) and owls. Typical of the locale and habitats present, an assemblage of breeding ground nesting waders has also been recorded, which includes curlew. The Site and immediate surrounding area are not identified as being important for migratory waterfowl.

7.3.4 Collision mortality risks to Proposed Development have been estimated using the NatureScot Collision Risk Model (CRM). Collision mortality risks are predicted as being low or negligible for all species.

7.3.5 The potential for significant direct and/or indirect habitat loss effects from the Proposed Development is also assessed and concluded to be **not significant** for any species, with the exception of black grouse.

7.3.6 Standard mitigation, including the appointment of a suitably qualified Ecological Clerk of Works (ECoW) during construction works and implementation of a Bird Disturbance Management Plan (BDMP), will enable the protection of breeding birds during construction works. An operational environmental advisor will also be appointed and which will enable the protection of breeding birds during operational maintenance works in accordance with measures set out within the BDMP.

7.3.7 Additional mitigation for inclusion within the BDMP is outlined in the additional mitigation within **Chapter 6: Ornithology (EIAR Volume 1**) to avoid the potential for construction and operational disturbance to lekking black grouse. Additional mitigation for inclusion within the Proposed Developments Biodiversity Enhancement Management Plan (BEMP) is also outlined within **Chapter 6 (EIAR Volume 1)** to further minimise the potential for collision risks to raptor species. An Outline BEMP is provided in **TA 7.7 (EIAR Volume 4)**.

7.3.8 The Proposed Development will also provide for the delivery of long-term beneficial habitat enhancement measures for bird species and wider biodiversity. This will include in areas away from operational infrastructure where specific management for breeding waders will be undertaken. This work will be in addition to habitat reinstatement following construction works.

7.3.9 Residual effects upon all IOFs are assessed to be **not significant** as a result of the Proposed Development alone, or in combination, with other wind farm developments.

7.4 Ecology

7.4.1 Baseline conditions to inform the design and assessment of the Proposed Development have been established through desk study, ecological field surveys in accordance with industry standard guidance, and consultation with nature conservation bodies.

7.4.2 The Site does not form part of any statutory designated site for nature conservation with ecological qualifying interests; based on a lack of connectivity to designated sites within 5 km of the Site, NatureScot (NS) agreed that these sites can be scoped out of the assessment. NS advised that there is potential for connectivity between the Proposed Development and the River Tay Special Area of

Conservation (SAC). However, It has been confirmed through a review of aerial maps, and as discussed with the authors of **Chapter 8: Geology, Peat, Hydrology and Hydrogeology (EIAR Volume 1)**, no part of the Proposed Development is located within the River Tay catchment so the Proposed Development is not hydrologically connected to the SAC. As such, the River Tay SAC is not at risk from the Proposed Development, and the risk of any likely significant effect upon the SAC is excluded, neither an appropriate assessment nor EIA assessment is required. There is a small area of Ancient Woodland Inventory (AWI) within the Site, present along Glen Beich to the south along the new access track, however the AWI has been avoided and no mature/semi-mature trees are expected to be lost as a result of the Proposed Development.

7.4.3 Baseline studies have established the Site is used by badger, bats, brown hare, mountain hare, otter, reptiles, and trout. The risk to all species, including high collision risk bat species and roosting bats, is considered to be low based on the levels and distribution of species activity recorded. The main and most extensive habitats present within the Site are blanket bog (25.46 % of Site), acid dry dwarf shrub heath (18.91 % of Site) and unimproved acid grassland (12.60 % of the Site). Acid/neutral flush, wet modified bog, marshy grassland and recently planted coniferous plantation woodland are also present each covering between 5 % and 10 % of the Site. The remainder of the Site is made up of a range of woodland, grassland, heath, flush, mire, swamp, and exposed ground. Further details are provided in **Chapter 7: Ecology (EIAR Volume 1).**

7.4.4 The Proposed Development has been designed to minimise impacts on important habitats or protected species as far as practicable. Embedded mitigation, good practice measures, and pre-construction checks (as directed by an appointed suitably qualified Ecological Clerk of Works (ECoW) will enable the protection of protected species during construction works associated with the Proposed Development.

7.4.5 The direct and indirect impacts associated with the construction phase of the Proposed Development are fully assessed in **Chapter 7: Ecology (EIAR Volume 1)** as resulting in **no significant effects**.

7.4.6 **No significant effects** are assessed to occur with respect to protected species.

7.4.7 In addition to habitat reinstatement and restoration following completion of construction works, the Proposed Development also provides an opportunity to deliver long-term beneficial habitat enhancement measures for habitats and species, including specific management for blanket bog enhancement, bracken control, and wetland enhancement. These proposals form the basis of the Outline Biodiversity Enhancement Management Plan (OBEMP) (**TA 7.7, EIAR Volume 4**) which will deliver significant biodiversity enhancement at the Site. A Biodiversity Net Gain (BNG) assessment and metric indicates measures proposed in the OBEMP would deliver +20% net gain for biodiversity.

7.4.8 Residual effects upon IEF are assessed to be **not significant** as a result of the Proposed Development alone, or cumulatively, with any other wind farm development (Glen Lednock windfarm).

7.5 Geology, Peat, Hydrology and Hydrogeology

7.5.1 Information for the Study Area was compiled using baseline information from a desk study and was then verified by an extensive programme of field work. The field work included investigation of private water supply sources in order to determine those which might be hydrologically connected to and at risk from the Proposed Development. Measures required to protect these sources have been confirmed. A site-

specific private water supply (PWS) risk assessment has been prepared and is presented in **TA 8.6: Private Water Supply Risk Assessment (PWSRA) (EIAR Volume 4)**.

7.5.2 The field work also included a programme of peat depth probing and condition assessment and a hydrological walkover survey by an experienced hydrologist.

7.5.3 The assessment undertaken considered the sensitivity of receptors identified during the baseline study and confirmed by the field work, and the (embedded) mitigation measures incorporated in the Proposed Development design. It has also considered potential future changes to baseline conditions.

7.5.4 The design of the Proposed Development has been informed by a detailed programme of peat depth probing in accordance with Policy 5 of the National Planning Framework 4 (NPF4) and it has been shown that wherever possible areas of deep peat have been avoided. The assessment of peat and carbon rich soils has considered all of the proposed infrastructure, including new and upgraded permanent access tracks. A project specific peat management plan **(TA 8.2: Peat Management Plan (PMP) (EIAR Volume 4))** has been prepared which confirms the soils disturbed by the Proposed Development are limited in volume and that these soils can be readily and beneficially reused in restoration works on site.

7.5.5 Subject to adoption of best practice construction techniques and a final Construction Environmental Management Plan (CEMP), no significant adverse effects on geology (including soils and peat) and the water environment have been identified. The final CEMP will include provision for drainage management plans which will be agreed with statutory consultees, including Scottish Environment Protection Agency (SEPA), Stirling Council (SC) and PKC which will be used to safeguard water resources and manage flood risk. A commitment to deploy Sustainable Drainage Systems (SuDS) in these plans has been made. The CEMP will also include provision of a Pollution Prevention Plan which would also be agreed with statutory consultees including SEPA prior to any construction works being undertaken. An Outline CEMP (OCEMP) has been prepared and is presented in **TA 2.1 (EIAR Volume 4)**. The final CEMP will be agreed with statutory consultees prior to construction.

7.5.6 Notwithstanding these safeguards, a programme of baseline and construction phase water quality monitoring is proposed which would be used to confirm that the Proposed Development **does not have a significant effect** on geology and the water environment. Monitoring of watercourses that drain from the site will be included in the monitoring plan. It is proposed that the monitoring schedule includes one PWS source. Monitoring would commence prior to construction and continue throughout the construction phase and immediately post construction. It is anticipated that the monitoring programme would be secured by a pre-development planning condition to be agreed with statutory consultees.

Carbon Balance

7.5.7 The calculations of total carbon dioxide emission savings and payback time for the Proposed Development indicates that the overall **payback period** will be around **0.9 years** (11 months) when compared to the fossil fuel grid fuel mix of electricity generation or 1.9 years when compared to the grid mix electricity generation. This means that the Proposed Development is anticipated to take around 0.9 or 1.9 years respectively to repay the carbon exchange to the atmosphere (the CO_2 debt) through construction; the Site would in effect be in a net gain situation following this time period and can then claim to contribute to national emissions reduction objectives thereafter for its remaining operational life.

7.6 Noise and Vibration

7.6.1 Noise associated with the construction and operation of the Proposed Development has been assessed in line with national guidelines, current good practice and in consultation with PKC. Construction noise arises from vehicles accessing the Site and the construction of the key components and infrastructure. Operational noise arises from the operation of the Proposed Development including noise from the BESS and the WTGs as they rotate to generate power. The significance of the noise impact depends on the levels arising during each phase of the Proposed Development, the duration of the noise exposure (i.e. noise from construction activities are permitted to be higher than operational noise due to the short term nature of the impact), and the existing baseline noise levels.

7.6.2 Construction noise impacts have been largely scoped out of detailed assessment as typical noise limits referred to in relevant guidance (BS 5228-1:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites) will be met at noise sensitive receptor locations in the vicinity of the Proposed Development. There may be temporary impacts associated with track construction and construction traffic accessing the Site and these have been considered in the assessment. The overall construction noise impact is determined to be not significant, and noise will be controlled and minimised as much as possible during the construction phase of the development via the Construction Environmental Management Plan (CEMP) which will be prepared and agreed with consultees prior to the commencement of construction. As decommissioning noise impacts will be the same or lower than construction impacts, they have similarly been scoped out of detailed assessment on the basis that if construction effects are determined to be not significant, decommissioning effects will also be **not significant**.

7.6.3 Operational noise from the proposed substation and adjacent BESS is assessed in according to BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound. The significance of the impact is assessed by comparing the rating sound level (i.e. the sound level at receptor locations including any relevant character corrections) with existing background sound levels. In this case a detailed assessment has been scoped out given the significant distances between the proposed BESS adjacent to the substation and residential receptor locations. The minimum separation distance is about 4.8 km to the nearest residential receptor, and at such distances operational noise from the substation and BESS is very unlikely to be audible. Therefore, operational noise from these elements of the Proposed Development have been scoped out of the assessment on the basis there was no likely significant effect.

7.6.4 Operational WTG 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. Predicted operational noise levels have been compared with relevant noise limits for the Proposed Development acting in isolation. Predicted operational noise levels meet the relevant ETSU-R-97 noise limits and therefore operational noise impacts are considered to be not significant. The ETSU-R-97 noise limits apply to cumulative WTG noise, as such, predicted cumulative noise levels have been compared with relevant noise limits. Predicted cumulative noise levels meet the relevant ETSU-R-97 noise limits and therefore operational noise effects are considered to be **not significant**.

7.7 Cultural Heritage

7.7.1 A desk-based assessment and field survey, informed by information provided by Historic Environment Scotland (HES), Stirling Council Archaeology Service (SCAS) and Perth & Kinross Heritage Trust (PKHT), have been carried out to establish the cultural heritage baseline, within the Site (Inner Study Area) and the wider landscape.

7.7.2 The baseline assessment has established that there are 84 assets within the Inner Study Area Zones and that there would be direct construction impacts on up to 12 of these assets. In addition, 17 other heritage assets lie within the micrositing allowance and could be affected by any micrositing of the proposed layout. In the absence of mitigation, eleven of these construction impacts are assessed as significant in EIA terms.

7.7.3 Mitigation measures have been set out that would avoid, reduce, or offset the predicted effects and residual effects of no more than minor significance (**not significant in EIA terms**) have been identified.

7.7.4 An assessment of the identified heritage assets, and consideration of the current and past land use, within the Inner Study Area, suggests that there is a low likelihood of hitherto unidentified archaeological remains of prehistoric or medieval/post-medieval date being present across the majority of the Site. Given the limited land take required by the separate elements of the Proposed Development within areas of increased potential, such as at the mouth of the Beich Burn, it is considered that the potential for further archaeological discoveries is low. Mitigation measures are proposed to address the possibility of direct effects on buried archaeological remains.

7.7.5 Within 10 km from the outermost turbines there are 20 Scheduled Monuments, five Category A Listed Buildings, 28 Category B Listed Buildings, two Conservation Areas, and two Inventory Garden and Designed Landscapes. Following consultation with HES, two additional Scheduled Monuments which lie within the Zone of Theoretical Visibility (ZTV) and beyond 10 km from the outermost turbines have been included in the assessment. Within 5 km from the outermost turbines there are seven Category C Listed Buildings.

7.7.6 It is assessed that the settings of designated assets would not be significantly adversely affected by the construction and operation of the Proposed Development.

7.7.7 The potential effect of the Proposed Development, both individually and cumulatively, in combination with other wind farm developments within 10 km of the outermost turbines has been considered. **No significant residual cumulative effects** on the setting of any heritage assets would arise from addition of the Proposed Development to a baseline including consented and Proposed Developments.

7.8 Traffic, Transport and Access

7.8.1 The Proposed Development will lead to a temporary increase in traffic volumes on the Site during the construction phase. Traffic volumes will fall considerably outside the peak period of construction, which is anticipated to be in month ten of the programme. During month ten, there will be a total of 192 two way vehicle movements per day, comprising 144 two-way HGV movements and 48 two-way car / Light Goods Vehicle movements.

7.8.2 This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile i.e. vehicles distributed evenly across the day.

7.8.3 This increase will be temporary and will only occur during the construction phase.

7.8.4 An assessment of likely significant effects associated with increased traffic during construction using Institute of Environmental Management and Assessment (IEMA) guidelines has been undertaken. Prior to the implementation of mitigation, a **Major** and **Significant** effect is predicted on the following sensitive receptors:

A85 Users at the Site access;
A84 Users south of Lochearnhead;
Drummond Estate Boat Hire / jetty / camping area;
Lochearnhead and Auchraw; and
Core Path / Path Users within the Site.

7.8.5 With the implementation of a comprehensive Construction Traffic Management Plan (CTMP), Abnormal Indivisible Load (AIL) Transport Management Plan, together with appropriate signage and path management plan (if required), the traffic effects would be transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts to **minor** and **not significant**. No long-term detrimental transport or access issues would be associated with the construction phase of the Proposed Development.

7.8.6 No capacity issues are expected on any of the roads within the Study Area due to the additional construction traffic movements associated with the Proposed Development, as background traffic movements are relatively low, the links are of a good standard and appropriate mitigation is proposed. The effects of construction traffic would be temporary in nature and would be transitory.

7.8.7 A review of the road network has been undertaken to assess the feasibility of transporting turbine components to the Site and no significant issues have been noted that cannot be overcome. Small scale and temporary remedial works are required at a number of locations along the identified delivery route. Further details are provided in **TA 11.1: Transport Assessment (EIAR Volume 4).**

7.8.8 Traffic levels during the operational phase of the Proposed Development will be low, with two to three vehicles per week for maintenance purposes. Traffic levels during the decommissioning of the Proposed Development will be lower than those associated with the construction phase as some elements may be left in-situ and others broken up onsite.

7.9 Socioeconomics, Recreation and Tourism

7.9.1 The population of Perth and Kinross and Stirling is increasing at a similar rate to that of Scotland. At the same time, the population of Perth and Kinross and Stirling is expected to age, growing older than that of Scotland as a whole. While the Local Area is less deprived than Scotland as a whole, economic activity is concentrated in a few sectors, including accommodation and food services activities and wholesale and retail trade, which collectively employ 36.3% of those in employment.

7.9.2 During the development and construction phase, it is estimated that the Proposed Development will generate up to:

£114 million Gross Value Added (GVA) and 156 years of employment in Perth and Kinross and Stirling; and
£48.3 million GVA and 564 years of employment in Scotland.

7.9.3 During each year of the operational phase, it is estimated that the Proposed Development could generate up to:

£1.3 million GVA and 9 years of employment in Perth and Kinross and Stirling; and
£3.0 million GVA and 25 years of employment in Scotland.

7.9.4 The Proposed Development would also provide community benefit funding of up to £372,000 annually.

7.9.5 It was estimated that the Proposed Development would pay £892,000 each year in non-domestic rates, helping to support local government services.

7.9.6 The most recent evidence on the relationship between wind farms and tourism suggests that there are no adverse effects on the tourism economy resulting from the development of onshore wind. An assessment of the likely effects of the Proposed Development on specific local tourism assets, accommodation providers and routes found no significant adverse effects are expected.

7.9.7 Overall, there were **no significant adverse effects** identified. While the beneficial construction and operation socioeconomic effects are not significant in EIA terms, they would be important to the local and national economies, contributing to sustainable economic growth.

7.10 Aviation

7.10.1 Information on aviation was collected through a detailed desktop review of existing studies and datasets. The desktop review was conducted using comprehensive aviation documentation and charts to identify potential aviation receptors during the construction, operation, and decommissioning phases of the Proposed Development. Consultation has been ongoing throughout the EIA process and relevant comments from the 2023 Scoping Opinion and other consultations specific to aviation provided by Edinburgh/Glasgow International/Glasgow Prestwick Airports, Ministry of Defence (MoD) and National Air Traffic Services (NATS) were considered with high-level responses provided within this chapter.

7.10.2 The aviation Study Area was defined to ensure that all relevant aviation receptors were assessed. The aviation receptors considered were as follows:

Civil airport Instrument Flight Procedures (IFPs) (including navigation aids NAVAIDs);
Military aerodrome IFPs (including NAVAIDs);
Civil Air Traffic Control (ATC) radar;
Military ATC radar;
Military Air Defence radar;
Low flying (military and civilian Emergency Helicopter Support Units (EHSUs));
Local minor aerodromes;
Local airspace restrictions (Prohibited/Restricted/Danger Areas and Military Practice Exercise Areas (PEXAs); and
Meteorological (Met) Office radars.

7.10.3 An aviation lighting assessment was also carried out by Wind Farm Low Flying Aviation Consultants (WFLFAC) in order to ascertain the exact aviation lighting requirements for the Proposed Development. The assessment proposed the visible and infra-red aviation lights to be installed on the Proposed Development's WTGs. The lighting proposal in the WFLFAC report has since been accepted and approved for installation by the Civil Aviation Authority (CAA).

7.10.4 The desktop review, coupled with consultation responses from the relevant aviation stakeholders, determined that only the following aviation receptors would potentially be affected by the Proposed Development:

Potential impact on military and civilian Emergency Helicopter Support Units (EHSU) low flying operations; and

Potential impact on the NATS Lowther Hill Air Traffic Control (ATC) radar.

7.10.5 In terms of military low flying and EHSU helicopter operations, pilots are ultimately responsible for seeing and avoiding obstructions. Wind turbines can be difficult to see from the air, particularly in poor meteorological conditions, leading to a potential increase in obstacle collision risk. In order to alleviate this risk, MoD has requested that, in the interests of air safety, the WTGs are fitted with MoD accredited aviation safety lighting and in accordance with the CAA, Air Navigation Order 2016 and that details of the Proposed Development are included on aviation charts. These arrangements form part of the embedded mitigation measures identified in the EIAR and once implemented, will ensure that the overall effect on military low flying and EHSU operations will be negligible and **not significant in EIA terms**.

7.10.6 Consultation has been carried out with NATS in order to identify how adverse impact on the Lowther Hill ATC radar can be alleviated. A preliminary agreement has been reached such that the ATC radar objection could be withdrawn subject to implementation of a suspensive planning condition. The Applicant is currently in discussions with NATS regarding installation of a wind farm mitigation solution and it is expected that an agreement will be in place prior to the application's consent decision.

7.10.7 In terms of cumulative effects, the impact on any aviation receptor is generally treated as a standalone impact. The predicted effects from the Proposed Development on aviation receptors are considered to be localised to within the footprint of the Site. Consequently, the Proposed Development is not considered to present any cumulative effect on aviation receptors in the region.

7.10.8 Overall, the effects of the Proposed Development have been minimised, as risk control measures will be put in place prior to the construction and operation phases. Once all mitigation measures have been implemented, there will be **no residual significant effects**.

7.11 Telecommunications and Television

7.11.1 The Proposed Development is predicted to have a Very Low magnitude of impact upon surrounding terrestrial television and radio services. This would be Negligible for Medium sensitivity receptors.

7.11.2 If interference is reported at isolated residences and is attributed to the Proposed Development, a Medium magnitude of impact would be predicted, which would be Moderate adverse.

7.11.3 Mitigations are available. Any isolated interference mitigation would reduce the magnitude of impact to Very Low once implemented, which would be Negligible for Medium sensitivity receptors and therefore **no likely significant residual effects** are predicted.

8 Summary

8.1.1 As a result of a combination of design-led mitigation and additional proven construction phase mitigation measures, the EIAR concludes that significant residual effects associated with the Proposed Development, alone and in combination with other assessed developments, are limited to landscape and visual effects which are largely localised to elevated parts of the Study Area for high sensitivity receptors.

8.1.2 No residual significant (adverse) effects are identified for Ornithology; Ecology; Geology, Peat, Hydrology and Hydrogeology; Noise and Vibration; Cultural Heritage; Traffic, Transport and Access; Socioeconomics, Recreation and Tourism; Aviation; or Telecommunications and Television. Measures proposed in the OBEMP would deliver +20% net gain for biodiversity.