



**STEPHENSON
HALLIDAY**

Planning, Landscape & Environment
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HALFWAY ENERGY PARK

Environmental Impact Assessment
Scoping Report
Halfway Energy Park Ltd.

July 2026

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Document history

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1 INTRODUCTION

1.1 Overview

- 1.1.1 This Environmental Impact Assessment (EIA) Scoping Report (EIASR) has been prepared by Stephenson Halliday Ltd in support of Halfway Energy Park Ltd. (the Applicant) and their proposal to submit an application to the Scottish Ministers under Section 36 (S36) of the Electricity Act 1989 to construct and operate the Halfway Energy Park, hereafter referred to as the 'Proposed Development'.
- 1.1.2 The Proposed Development is located in the Carse of Gowrie approximately 11km east of Perth and 9km southwest of Dundee, and is located wholly within the administrative boundary of Perth and Kinross Council (PKC). The location is as shown on **Figure 1.1: Site Location**.
- 1.1.3 The Proposed Development comprises the construction and operation of up to 500MW ground-mounted solar photovoltaic (PV) farm together with up to 100MW co-located Battery Energy Storage System (BESS) and associated infrastructure including inverter/transformer stations, substations (including Site substation and Transmission Operator Grid substation, the latter will be applied for separately under a Section 37 consent application), underground cabling, access tracks, temporary construction compounds, security fencing, CCTV, landscaping, and biodiversity enhancements.
- 1.1.4 The Site subject to this scoping request is the area within the red line boundary (RLB) as shown on **Figure 1.1: Site Location**. **Figure 2.2 Scoping Layout** shows the current indicative layout. The layout includes indicative land parcels which based on current desk based and Site assessments are the current identified locations for hosting PV, BESS, substations, and habitat mitigation and enhancement.
- 1.1.5 In addition, due to the scale of the Proposed Development and the requirement to ensure flexibility in the design iteration process, it may be necessary to reduce or move some of the Indicative PV Area. These design iterations may be required as informed by detailed site work, to deliver optimal areas for mitigation and biodiversity enhancement and/or address constraints identified through Scoping and consultation. Therefore, within the RLB the Site includes some additional potential option areas for both PV and mitigation to ensure flexibility. These potential additional options are included to identify land areas which may form part of the final design subject to further assessment. These areas are scoped in due to their potential inclusion, however as their inclusion is less certain, throughout this Report these optional sites are separately addressed from the indicative areas identified above.
- 1.1.6 Furthermore, the currently identified indicative locations for underground cable route corridors are included for an understanding of the likely infrastructure requirements to support the Proposed Development. However, the final routes are still to be confirmed through the design iteration process, subject to the final design and layout of panels and mitigation. This EIASR therefore considers these routes alongside the potential additional options, separate to the infrastructure noted in **Paragraph 1.1.4**.
- 1.1.7 Indicative locations for potential solar panels and mitigation have been included within the area of the Megginch Garden and Designed Landscape. This area is subject to ongoing

discussions with Historic Environment Scotland, the outcome of which will inform potential uses and layout in this location.

1.2 Background and Scoping

- 1.2.1 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations) apply in the case of an application under S36 of the Electricity Act 1989 for consent to construct, extend or operate a generating station. The EIA Regulations make provisions for obtaining a Scoping Opinion from Scottish Ministers as to the environmental effects to be considered in the EIA (Regulation 12) and reported in the EIA Report (EIAR).
- 1.2.2 This EIASR provides the Applicant's written request to the Scottish Government for the adoption of a 'Scoping Opinion' as to which environmental effects are to be considered in the EIA and which matters may be scoped out. It provides details of the Proposed Development, a description of the Site and surrounding area, and the environmental desk-based and field survey work undertaken to date to establish the environmental baseline conditions. It then identifies potential significant effects as a result of the Proposed Development and the proposed approach and methodology to assess the effects, the role of mitigation, and reporting the residual effects of the Proposed Development.
- 1.2.3 In accordance with the EIA Regulations, a Scoping Opinion is anticipated from Scottish Ministers by September 2026 following receipt of this Scoping Opinion request.
- 1.2.4 The works undertaken as part of the EIA will be used to inform the final design of the Proposed Development and assess predicted effects on the environment. The EIA process is iterative in nature and as such the final Proposed Development will continue to evolve in line with ongoing assessments which are to be agreed as part of the Scoping Opinion.
- 1.2.5 The EIASR structure is set out in **Section 1.5**.

1.3 The Applicant

- 1.3.1 The Applicant is Halfway Energy Park Limited, an Aukera Special Purpose Vehicle (SPV). Aukera is a renewable energy Independent Power Producer (IPP) operating across the UK and Europe. Aukera specialise in utility-scale solar, onshore wind, and BESS, and are actively involved at every stage of the project lifecycle.
- 1.3.2 With 58.4MWp of renewable energy infrastructure already operational in the UK and a further 295.5MWp under construction, Aukera is building a significant and growing presence with 60% of the pipeline located in Scotland. Aukera's team works from offices in London and Edinburgh, combining national reach with local expertise.
- 1.3.3 Beyond the UK, Aukera maintains an active development portfolio across Italy, Belgium, Germany, and Romania. Responsible development and genuine community engagement sit at the heart of everything Aukera does, as they continue to invest in projects that support a sustainable, low-carbon energy future.

1.4 Consultation

- 1.4.1 The design is at an early stage of development, and consultation will be undertaken with the following host Local and Community Councils:
- Perth and Kinross Council,
 - Errol Community Council; and
 - Inchtute Community Council.
- 1.4.2 In addition, the following neighbouring Councils and Community Councils will also be consulted:
- Dundee City Council;
 - Angus Council;
 - Fife Council;
 - Longforgan Community Council;
 - West Carse Community Council;
 - Newburgh Community Council;
 - Abdie and Dunbog Community Council;
 - Balmerino, Gauldry, Logie and Kilmany Community Council.
- 1.4.3 Consultation will also be undertaken directly as part of the Scoping exercise with relevant statutory and non-statutory consultees.
- 1.4.4 Consultation feedback will form an integral part of the iterative design process. Where appropriate within each chapter of this EIASR (**chapters 4-14**), the relevant technical consultants have identified the organisations and parties they intend to consult with as part of the EIA process.
- 1.4.5 The EIAR will set out the design iteration process which has taken place from inception through to the final design submitted when the S36 consent application is made and will confirm where issues raised through consultation have been addressed in the final design.

1.5 Report Structure

- 1.5.1 This EIASR is structured as follows:
- **Chapter 2** provides a description of the Site and the surrounding context, and an outline description the Proposed Development.

- **Chapter 3** provides information on the EIA process and assessment methodology; and includes an overview on key planning, climate change and energy policy and legislation relevant to the Proposed Development.
- **Chapters 4 to 14** outline the environmental topic areas to be considered in the EIA.

1.5.2 The EIASR is supported by the following Appendices and Figures:

- Figure 1.1 Site Location Plan
- Figure 2.1 Land Parcel Labels
- Figure 2.2 Scoping Layout
- Figure 4.1 Bare Earth Zone of Theoretical Visibility
- Figure 4.2 Landscape Context with Screening Zone of Theoretical Visibility
- Figure 5.1a-h Heritage Asset Plan: Inner Study Area
- Figure 5.2a-b Archaeological Events within Inner Study Area
- Figure 5.3a-e Heritage Assets within the Outer Study Area
- Figure 5.4a-e Heritage Assets within the Outer Study Area with Zone of Theoretical Visibility
- Figure 6.1 Statutory Designated Sites for Nature Conservation with Ecological Interests
- Figure 7.1 Statutory Designated Sites With Bird Interest
- Figure 9.1 Agricultural Land Capability
- Figure 9.2 Hydrological Features
- Figure 9.3a Watercourse and Flooding - Future Flood Maps River Medium Likelihood Flood Depths
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- Figure 10.1a-c Construction Dust Risk Study Area and Human Receptors
- Figure 10.2a-c Construction Dust Risk Study Area and Ecological Receptors
- Appendix 5.1 Initial Cultural Heritage Appraisal
- Appendix 14.1 Glint and Glare Methodology

Terminology

1.5.3 The following terminology has been adopted throughout this EIASR.

Table 1.1: Site and Study Area Definitions

Term	Definition
Proposed Development	The proposed solar farm, BESS, substations and ancillary infrastructure.
The Site	This refers to everything within the RLB.
Study Area	The Site and/or Site access plus any additional area over which desk based or field assessments have been extended. The study area varies depending on the nature of the potential effects for each environmental parameter, as informed by professional guidance and best practice regarding EIA. The final study areas will be informed by the Scoping Opinion and defined in the EIAR. Each technical chapter within this EIASR has sought to identify the relevant study area appropriate for their technical discipline.
Indicative PV Area	Each area identified in Figure 2.2 within the RLB as preferred areas for Photovoltaic (PV) panels and directly associated infrastructure, subject to further consultation, site survey work and design iteration process.
Habitat Mitigation and Enhancement and Underground Cable Route Corridor	Areas within the RLB identified in Figure 2.2 for preferred locations for the location for habitat mitigation and enhancement and underground cable route corridor, subject to further consultation, site survey work and design iteration process.
Indicative Underground Cable Route Corridor	Areas within the RLB as identified in Figure 2.2 for an Indicative Underground Cable Route Corridor, subject to further consultation, site survey work and design iteration process.
Potential Alternative Option for BESS/Substation	The areas within the RLB identified in Figure 2.2 as alternative locations for BESS and substations to be located if these cannot be located on the Indicative Preferred BESS and Substation Area. These areas will otherwise be used as an Indicative PV area. Inclusion as part of the final design is not confirmed, such confirmation will be made through the design iteration process, consultation and discussion with landowners.
Indicative Preferred BESS and Substation Area	The area within the RLB identified in Figure 2.2 for the preferred location of BESS and substations (site substation and Transmission Operator Grid substation, the later will be applied for separately via a Section 37 consent application).

Term	Definition
Potential Additional Option for PV	Areas included in the RLB as identified in Figure 2.2 for potential additional PV provision and associated infrastructure to allow project flexibility. Inclusion as part of the final design is not confirmed, such confirmation will be made through the design iteration process, consultation and discussion with landowners.
Potential Additional Option for Habitat Mitigation and Underground Cable Route	Areas within the RLB as identified in Figure 2.2 as the potential additional search areas for habitat mitigation and enhancement and underground cable route corridors. Inclusion as part of the final design is not confirmed, such confirmation will be made through the design iteration process, consultation and discussion with landowners.
EIASR	Environmental Impact Assessment Scoping Report This report, which sets out the scope of the EIA.
EIA Report/ EIAR	Environmental Impact Assessment Report which will report the findings of the EIA.

2 PROJECT DESCRIPTION

2.1 Introduction

- 2.1.1 This chapter provides a high level description of the main elements of the Proposed Development and also provides a description of the Site and surrounding context. **Figure 1.1 Site Location** shows the location and Site boundary extent.
- 2.1.2 It should be noted that subsequent to receipt of the Scoping Opinion, the design of the Proposed Development will evolve and will:
- consider comments received as part of the scoping process and through public consultation;
 - take account of constraints and issues raised through baseline studies both completed and currently in progress;
 - take account of detailed site work to be undertaken by the consultant team; and
 - through the subsequent iterative assessment of impacts to be undertaken by the consultant team through design workshops, seek to avoid or mitigate by design, significant environmental effects of the Proposed Development.

2.2 Site Description

- 2.2.1 The Proposed Development Site is the area within the RLB as shown in **Figure 1.1**. It lies in an area of predominantly lowland agricultural and grazing land, broadly between the settlements of Inchtute, Errol and Rait.
- 2.2.2 The closest part of Indicative PV Areas proposed for the Site to existing settlements is noted below, with Potential Additional Options noted in brackets, located:
- to the immediate north, northwest and northeast of Grange (southwest);
 - to the immediate east of Kinnaird;
 - 0.1km southwest (immediate west and east) of Errol Station;
 - 0.1km west of Inchtute;
 - 0.25km north and 0.25km east of Errol;
 - 4.7km northeast of St Madoes;
 - 9km southwest of Dundee; and
 - 11km east of Perth.

- 2.2.3 The Site is located within the Carse of Gowrie and situated north of the River Tay. The Proposed Development Site is bisected by both the A90 trunk road and the railway line running between Perth and Dundee, as well as two high voltage overhead lines. Several pows (drainage ditches) and burns cross the Site generally from northwest to southeast.
- 2.2.4 The land and fields within the Proposed Development Site have been assigned land parcel labels as shown on **Figure 2.1**, to assist with clear identification of specific land and field areas throughout this EIASR.

Landscape

- 2.2.5 The Site is situated within relatively level, open, lowland agricultural and grazing land interspersed with linear tree belts and small woodland blocks. The surrounding area is sparsely settled.
- 2.2.6 There are no national landscape designations within the study area or within 20km of the Site.
- 2.2.7 The Site area to the north of the A90 and most of the northwestern part of the study area coincides with the Sidlaw Hills Local Landscape Area (LLA). The Tay Coast LLA within Fife occupies a long band of low hills and coastal landscape between 4-5km south of the Site.
- 2.2.8 There are several designated Garden and Designed Landscape (GDL) within the study area, including Megginch Castle, Fingask Castle, Errol Park, Rossie Priory, and Glendoick.

Recreation

- 2.2.9 The Core Paths in the vicinity of the Site are largely concentrated around the village of Errol and the southern facing slopes of the Sidlaw Hills.

Ecology

- 2.2.10 The Proposed Development Site area is predominantly used for arable farming and sheep grazing. There are several small scattered pockets of planted broad-leaved or mixed woodland, and numerous hedgerows, lines of (and scattered) mature trees, watercourses, pows and ditches. The Site overall is relatively open in nature, and accordingly, across most of the Site, habitats with potential ecological value are restricted to the field boundaries and wooded areas.
- 2.2.11 There are no national or local ecological designations within the Site boundary. The statutory designated sites for nature conservation with ecological interests within 10km of the Site are:
- Firth of Tay and Eden Estuary Special Area of Conservation (SAC), located adjacent to the Site to the south;
 - Inner Tay Estuary Site of Special Scientific Interest (SSSI), located adjacent to the Site to the south;
 - River Tay SAC, located 6.2km to the southwest of the Site; and
 - Flisk Wood SSSI, located 4.2km to the southeast of the Site.

Ornithology

- 2.2.12 In addition to the national ecological designations listed above there are two additional statutory sites located within the defined Zone of Influence of the Proposed Development for ornithology, which are:
- Outer Firth of Forth and St. Andrews Bay Complex Special Protection Area (SPA), located 16.2km east of the Site; and
 - South Tayside Goose Roosts SPA and Ramsar site, located 19.7km west of the Site.

Cultural Heritage

- 2.2.13 There is one designated heritage asset located within the Site namely the GDL of Megginch Castle. The Perth and Kinross Historic Environment Record (HER) and National Record of the Historic Environment (NRHE) hold a record of eleven additional non-designated heritage assets located within the Site.
- 2.2.14 Within 2km of the Proposed Development, there are a large number of designated heritage assets, comprising:
- 4 Conservation areas;
 - 25 Scheduled monuments;
 - 161 Listed buildings comprising 12 Category A listed buildings, 76 Category B listed buildings and 73 Category C listed buildings; and
 - 5 Inventory Gardens and Designed Landscapes.
- 2.2.15 There are a number of other non-designated heritage assets located within 2km of the Site boundary, which are listed in **Technical Appendix 5.1: Initial Cultural Heritage Appraisal**.
- 2.2.16 **Technical Appendix 5.2: Addendum to Initial Cultural Heritage Appraisal** provides further information about and assessment of the additional areas (Potential Additional Options), following the same methodology as set out in the Initial Cultural Heritage Appraisal.

Soils, Geology and Water Environment

Bedrock Geology and Superficial Geology

- 2.2.17 No significant structural geological features, mining activities or recorded mine entries are identified within the Site, and no significant areas of artificial ground are recorded across the Site.

Soils

- 2.2.18 In terms of the Land Capability for Agriculture (LCA) classification, (the classification system used to illustrate the potential productivity and cropping flexibility of land), the majority of the Proposed Development Site is Class 3.1; the area west and southwest of North Inchmichael is Class 3.2; and a small area around Westown is Class 2, refer to **Figure 9.1**.

Hydrogeology

- 2.2.19 The Site is located upon the Dundee groundwater body and the Carse Costal groundwater body, with a current (2024) overall status of 'Poor', due to poor chemical status and water quality.

Hydrology

- 2.2.20 The Site is located within the Dundee Coastal Catchment, with all watercourses on the Site draining in a southerly direction towards the Upper Tay Estuary.

Flood Risk

- 2.2.21 Scottish Environmental Protection Agency (SEPA) flood mapping indicates that the Site is not at risk from coastal flooding. Large areas of the Site are shown to be at risk of flooding from fluvial sources both now and in the future. Large areas of the Site, especially to the north, are shown to be at risk of flooding from surface water and small watercourses, both now and in the future.
- 2.2.22 The following geological and hydrological registered or designated sites are located within 500m of the Site:
- Inchcoonans Geological Conservation Review (GCR) site and Inchcoonans Claypit Special Site of Scientific Interest (SSSI), located approximately 113m from the Site boundary; and
 - The Firth of Tay and Eden Estuary Ramsar, SAC and SPA, which is underpinned by the Inner Tay Estuary SSSI. All are located immediately adjacent to the southern boundary of the Site.

Transport

- 2.2.23 The Site is bisected both by the A90 road and the railway line running between Perth and Dundee. The Site will be accessed from the A90 and the surrounding local road network. **Figure 2.2** shows the Proposed Primary and Alternative Access Routes and Proposed and Alternative Access Points.

2.3 The Proposed Development

Description of the Proposed Development

- 2.3.1 The Proposed Development comprises the construction and operation of a ground-mounted solar photovoltaic (PV) farm with a generation capacity up to 500MW together with a co-located BESS up to 100MW, and associated infrastructure including inverter/transformer stations, substations, underground cabling, access tracks, temporary construction compounds, security fencing, CCTV, landscaping, and biodiversity enhancements.
- 2.3.2 The Proposed Development will connect to a new Grid substation to be located on Site.
- 2.3.3 The Site subject to this scoping request is the area within the RLB as shown on **Figure 1.1: Site Location**. **Figure 2.2: Scoping Layout** shows the current indicative layout. The layout

includes indicative land parcels which based on current desk based and Site assessments are the current identified locations for hosting PV, BESS, substations, and habitat mitigation and enhancement.

- 2.3.4 In addition, due to the scale of the Proposed Development and the requirement to ensure flexibility in the design iteration process, it may be necessary to reduce or move some of the Indicative PV Area. These design iterations may be required as informed by detailed Site work, to deliver optimal areas for mitigation and biodiversity enhancement and/or address constraints identified through Scoping and consultation. Therefore, within the RLB the Site includes some additional potential option areas for both PV and mitigation to ensure flexibility. These potential additional options are included to identify land areas which may form part of the final design subject to further assessment. These areas are scoped in due to their potential inclusion, however as their inclusion is less certain, throughout this Report these optional sites are separately addressed from the indicative areas identified above.
- 2.3.5 Furthermore, the currently identified indicative locations for underground cable route corridors are included for an understanding of the likely infrastructure requirements to support the Proposed Development. However, the final routes are still to be confirmed through the design iteration process, subject to the final design and layout of panels and mitigation. This EIASR therefore considers these routes alongside the potential additional options, separate to the infrastructure noted in **Paragraph 1.1.4**.
- 2.3.6 Indicative locations for potential solar panels and mitigation for the area of the Megginch Garden and Designed Landscape is subject to ongoing discussions with Historic Environment Scotland, to find the most suitable layout given the designation.
- 2.3.7 The layout will be refined with input from technical experts through the design iteration process.
- 2.3.8 The Proposed Development is expected to comprise the following key components. It should be noted that the final design is yet to be confirmed through the ongoing design iteration process:
- Photovoltaic Panels are likely to be positioned at a 15 – 20 degree angle with the highest point of the panel having an indicative maximum height of 3.5m;
 - Mounting frames – matt finished small section metal structure a minimum of 0.8m from ground level;
 - Inverters (either string or central) and 33kV transformer stations (housed in prefabricated containers) and associated underground cabling to connect the solar farm to the Project substation and then to the SSENT substation;
 - A BESS, comprising containerised battery units, associated power conversion systems (PCS), transformers, and ancillary infrastructure, with underground cabling to connect to the on-site electrical infrastructure and substations;
 - A Project Substation which will include substation, switching and control equipment;
 - A new Grid Substation on behalf of the Transmission Operator which will be subject to a separate Section 37 Application;

- Temporary construction compound areas, which will include office and welfare facilities, storage areas, and provisions for vehicular parking and material laydown;
- Security fencing, sympathetic to the local area, and infra-red CCTV (CCTV cameras would operate using motion sensors and would be positioned inward to the Site to ensure privacy to neighbouring land and property);
- Permanent hardstanding areas adjacent the proposed accesses for construction vehicle turning and set-down and for subsequent maintenance vehicles;
- Internal tracks for construction and maintenance;
- Site access points for the construction and operational phases; and
- Landscaping scheme and biodiversity mitigation and enhancements to be confirmed through pre-application assessment by the project's Landscape Architect, Ecologist and Arboriculturist.

- 2.3.9 A layout for the Proposed Development Site will be refined through environmental assessment work, but it is envisaged that the PV panels will be laid out in arrays (south facing) running from east to west across the Site. The PV panels spacing will be confirmed in the EIAR, with adequate spacing to avoid inter-panel shading.
- 2.3.10 Each row of panels would be ground mounted on a metal frame, with metal supports pile driven into the ground, to a depth of approximately 1.5 to 2.5m dependant on ground conditions. Alternatively, the frames could sit on concrete footings in the eventuality that certain areas have archaeological potential, which would ensure no impact on potential archaeological features.
- 2.3.11 The Site will be secured by a circa 2.4m high deer fencing. CCTV cameras will be mounted on poles, typically 3m in height which will be pointed towards the Proposed Development infrastructure to ensure security whilst maintaining privacy of neighbouring residential and business properties. The EIAR will provide figures showing indicative drawings of fencing and CCTV.
- 2.3.12 The solar panels will be connected to small inverter units. The invertors will connect to transfer stations which converts the electricity from Direct Current (DC) to Alternating Current (AC).
- 2.3.13 The Proposed Development would connect to a new Grid substation which is located within the Proposed Development Site boundary and would be delivered and operated by SSENT. The SSENT substation is included in the S36 consent application however the design and consent will be managed and undertaken separately by SSENT. This will ensure connection to the grid on-site and no further assessment of grid connection is therefore considered necessary.

Construction and Operation

- 2.3.14 It is anticipated that construction of the Proposed Development would take approximately 18 – 24 months to complete. Once complete, operation would be largely autonomous, with visits likely to be limited to essential maintenance activities. Details of the proposed construction period and any phasing will be detailed within the EIAR.

- 2.3.15 It is intended that the Proposed Development would operate for a period of 40 years, following which it would either be decommissioned, or alternatively a separate application would need to be made to extend its operational life. The EIAR will assume decommissioning is undertaken at the end of the operational life and will provide details of the intended decommissioning and confirm relevant planning conditions which would be attached to any consent to ensure appropriate draft decommissioning plans are submitted at the relevant time.

3 EIA PROCESS AND METHODOLOGY

3.1 Introduction

- 3.1.1 This chapter sets out the proposed approach to the EIA for the Proposed Development, in accordance with EIA Regulations. It describes the EIA process, an overview of the methodology to be applied in identifying and assessing likely significant effects, and the approach to mitigation and residual effects.
- 3.1.2 EIA is the process of assessing the likely environmental impacts of a proposal and identifying options to minimise environmental harm. The main purpose of EIA is to inform decision makers of the likely significant impacts of a proposal before a decision is made. EIA provides an opportunity to identify key issues and stakeholders early in the life of a proposal so that potentially adverse impacts can be addressed before final approval decisions are made.
- 3.1.3 In accordance with the EIA Regulations, the EIAR will identify and evaluate the likely significant environmental effects arising from the Proposed Development both in its own right and in-combination with other relevant developments such as, the likely significant cumulative impacts, on factors of:
- Population and human health;
 - Biodiversity;
 - Land, soil, water, air and climate; and
 - Material assets, cultural heritage and the landscape.
- 3.1.4 In accordance with the EIA Regulations the following information will be presented in the EIA Report:
- A description of the Proposed Development;
 - An outline of reasonable alternatives studied and the design iteration process;
 - A description of the environmental baseline and outline the likely changes to the baseline without implementation of the Proposed Development;
 - A description of the methods and evidence used to identify and assess the significant effects on the environment, including reliance of previous data and consultations undertaken by the Applicant as well as any difficulties experienced by the Applicant and their consultant team;
 - Identification and assessment of cumulative effects;
 - A non-technical summary; and
 - A reference list detailing the sources of information used for the various assessments.

- 3.1.5 In addition, the following information will be provided in the non-technical introductory chapters of the EIA Report:
- An introduction to the EIAR in a legislative and site specific context;
 - A full description of the Proposed Development site and surrounding area;
 - EIA methodology;
 - Confirmation of elements scoped into and out of the assessment;
 - EIAR structure; and
 - EIA project team, confirming their competent expertise.
- 3.1.6 It is noted that Scottish Renewables, in collaboration with the Scottish Government and industry partners, has published the Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms (September 2025).
- 3.1.7 This guidance represents an important step toward a more efficient, proportionate, and effective planning and consenting process, supporting Scotland's ambition to achieve 20GW of onshore wind capacity by 2030. While primarily focused on onshore wind, the principles set out are also relevant to other forms of development, including large-scale solar projects.
- 3.1.8 This EIAR has been prepared with regard to this guidance, particularly its emphasis on focusing on likely significant effects, ensuring proportionate assessment, and adopting clear and consistent reporting structures.

3.2 Scoping Process and Legislation

The Scoping Process

- 3.2.1 Scoping is undertaken to refine the scope of the assessment of environmental impacts and ensure that it is robust but focused in its approach on potentially significant effects. This will be achieved by inviting the Scottish Ministers and consultees to:
- Specify aspects of the environment and issues relating to these that should be considered and addressed in the EIA (with an emphasis on any issues local to the Site);
 - Comment on the proposed approach to the EIA;
 - Comment on or recommend, where appropriate, assessment methodologies including to define and agree a survey framework from which a comprehensive overall assessment can be produced; and
 - Highlight other relevant bodies or organisations that may have a vested interest in the scheme or be able to provide relevant information.

- 3.2.2 Once the Scoping Opinion has been issued and adopted by the Energy Consents Unit (ECU) on behalf of Scottish Ministers, the responses will be analysed and used to inform the assessment process.

Legislation

- 3.2.3 The EIA will be undertaken in accordance with the relevant EIA Regulations.
- 3.2.4 The Proposed Development is not classified as a Schedule 1 project under the EIA Regulations, however it is defined within Schedule 2 (1) a generating station.
- 3.2.5 The EIA will satisfy the requirement of Schedule 4 of the EIA Regulations, which details the information to be contained within the EIA Report.
- 3.2.6 Schedule 4, Part 4 specifies that the EIA Report should include the following:
- “A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.”*
- 3.2.7 Schedule 4, Part 5 details further requirements of the EIA Report, including:
- “A description of the likely significant effects of the development on the environment resulting from, inter alia:*
- a) the construction and existence of the development, including, where relevant, demolition works;*
 - b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
 - c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*
 - d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
 - e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*
 - f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;*
 - g) the technologies and the substances used.”*
- 3.2.8 In addition, in accordance with Parts 6 – 8 of Schedule 4, the EIA Report will include the following:
- “A description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of any difficulties encountered.”*

Approach

- 3.2.9 The EIA will be conducted in accordance with the requirements of the EIA Regulations. In line with established best practice the design of the Proposed Development will evolve in an iterative manner informed directly through consideration of constraints and opportunities that exist within and around the Site, consultation with statutory and non-statutory consultees and community consultation.
- 3.2.10 This approach ensures that environmental considerations are embedded into the design from an early stage, allowing avoidance and reduction of potential significant environmental effects where practicable.
- 3.2.11 The 'design freeze' stage (the final layout for the S36 consent application) will form the basis of the impact assessment. The four key stages of assessment are summarised as follows.

Consultation

- 3.2.12 Consultation forms a fundamental component of the EIA process and has commenced and will continue throughout the evolution of the Proposed Development. The approach to consultation is consistent with the EIA Regulations, which require consultation with prescribed bodies and other relevant stakeholders and will include community consultation.
- 3.2.13 Early and ongoing engagement is intended to ensure that the scope of the EIA is appropriate, that key environmental issues are identified at an early stage, and that stakeholder feedback is used to inform the iterative design process.
- 3.2.14 Consultation with relevant authorities, organisations and stakeholders will be undertaken throughout the EIA and design process, commencing with Scoping.
- 3.2.15 This EIASR will be submitted to the ECU, who will then consult with all the identified consultees before forming their Scoping Opinion. Consultees will be consulted by the technical specialists on an informal basis for information to inform the EIA assessments as and when required.
- 3.2.16 The consultations will serve three main purposes:
- To establish a sufficiently robust environmental baseline of the Site and its surroundings.
 - To identify, early in the process, specific concerns and issues relating to the Site and Proposed Development in order that they can be discussed and accounted for appropriately in the design and assessment.
 - To ensure appropriate involvement of the public and statutory and non-statutory consultees in the assessment and design process.
- 3.2.17 Public consultation events will be held in accordance with the current guidance relevant at the time the application is made. At present this would include in-person events which would be advertised in advance in the local press. A minimum of two public exhibition events will be undertaken as part of the application process and will provide an opportunity for the public to learn about the Proposed Development, through viewing information boards, maps and visualisations, and discussion with Proposed Development representatives. The first event will be undertaken to consider an updated design, once the Scoping Opinion has been

received and a design workshop undertaken to enable review of the issues raised and informed by the competent experts appointed on each technical topic. This will show the evolution of the design since the EIASR was undertaken. The second event will provide feedback on the matters raised in the first event. Feedback on the Proposed Development will be encouraged; and where received, this will be taken into account in the design evolution where feasible.

- 3.2.18 A Project website will also be created to reach a wider audience and for those that do not want to/cannot attend an in-person event. The Applicant will also actively engage in discussions with local community groups and Community Councils regarding community involvement in the Proposed Development, and how the community might benefit financially from the Proposed Development.

Baseline

- 3.2.19 The EIASR is based on a combination of desk based appraisal utilising available data from a range of sources including OS mapping, Development Plans, Site surveys and information supplied by the Applicant and from statutory and non-statutory consultees.
- 3.2.20 The baseline information gathered as part of this process will form the basis of assessment and further consultations with the relevant statutory and non-statutory consultees and stakeholders. The environmental baseline of the Site and its surroundings will be established and then reported in the EIAR.
- 3.2.21 Any relevant information and data gathered during the feasibility stage will also be used in the EIA process.

Development of Mitigation Measures

- 3.2.22 By virtue of the iterative design approach to the design of the Proposed Development, constraints will be avoided wherever possible and then mitigation measures proposed through embedded design (primary mitigation) such as buffers or considered siting; secondary mitigation will be confirmed in the EIAR, which confirms how additional mitigation can address significant effects for example through Construction Environment Management Plans or inclusion of acoustic bunding. Finally the EIAR will set out tertiary mitigation which confirms where other legislation is to be relied upon to control environmental effects, or planning conditions which are proposed to be attached to address significant effects from occurring. The assessment will consider embedded design as forming part of the Proposed Development; where significant effects are predicted, technical EIAR chapters will consider whether secondary/tertiary mitigation can be employed to reduce the effects with an assessment of residual effects to consider the effects of the development with all mitigation employed.
- 3.2.23 The evolution of the design, including a description of alternatives considered and rationale behind the 'preferred' development option will be set out within the EIAR. This will include the design work which has taken place from project inception up to the final design selected.

Assessment of Environmental Impacts and their Significance

- 3.2.24 In accordance with the EIA Regulations potential environmental impacts of the Proposed Development will be identified and their significance determined. Evaluation of significance will use specific criteria for each assessment factor. The methodology for such is set out within this EIASR for each technical chapter and is to be agreed by the Scoping Opinion.

- 3.2.25 Unless specified otherwise in the EIAR, the following terms will be used to assess impact significance where they are predicted to occur.
- Major beneficial or adverse – where the development would cause a significant improvement or deterioration to the existing environment;
 - Moderate beneficial or adverse – where the development would cause a noticeable improvement or deterioration to the existing environment and which may result in a significant effect, subject to professional judgement;
 - Minor beneficial or adverse – where the development would cause a barely perceptible improvement or deterioration to the existing environment which is not significant; and
 - Negligible – no discernible improvement or deterioration to the existing environment which is not significant.
 - None – no effect is predicted.
- 3.2.26 The significance of residual impacts such as, those predicted once mitigation is taken account of, will form the basis of the assessment.
- 3.2.27 With regard to the duration of effect, this will accord with the following timescales, unless otherwise stated:
- Short-term: 0-5 years;
 - Medium-term: 5-15 years; and
 - Long-term: 15 years onwards.

Cumulative Effects

- 3.2.28 Both intra-project and inter-project cumulative effects will be considered in the EIAR. Inter-cumulative effects occur when infrastructure from multiple separate approved developments or applications in planning have a combined effect on a given receptor, while intra-cumulative effects occur when a given receptor is impacted by multiple different effects that occur as a result of the same development, in this case by the Proposed Development.

3.3 Scope and Content of the EIA Report

- 3.3.1 The scope of the EIA as reported in this EIASR is informed by the data gathered to date. The aim is to be proportionate and limit the scope of the EIA to the areas which are predicted to result in likely significant effects in accordance with the EIA Regulations.
- 3.3.2 The EIAR will seek to confirm which topics or parts of topics which are scoped out, as informed by this EIASR and the Scoping Opinion. Having regard to the characteristics of the Site and the Proposed Development, it is considered at this scoping stage that the likely topics where significant effects are likely to occur prior to mitigation and requiring assessment within the EIAR and therefore “**scoped in**” include:
- Landscape and Visual Impact;

- Archaeology and Cultural Heritage;
- Ecology;
- Ornithology;
- Soils, Geology and Water including Flood Risk;
- Traffic and Transport;
- Noise and Vibration; and
- Carbon and Climate.

3.3.3 **Chapters 4-14** of this EIASR set out the proposed scope for each of the technical topics considered within this EIASR including the scope and methodology for the technical topics listed above, confirming which matters are scoped in and out of the EIAR. The following section of this chapter confirms technical topics or parts thereof, proposed to be “**scoped out**” of the EIAR. These are listed below, alongside a summary of the reasoning for why these topics are not considered to require further environmental assessment.

Chapters Scoped Out

Socio-Economics

- 3.3.4 Given the nature of Proposed Development and current EIA guidance and practice relating to socio-economics, the Socio-Economic Impact Assessment (SEIA) is scoped out of the EIAR and will instead be reported separately through a standalone SEIA report which will accompany the S36 consent application.
- 3.3.5 This approach is standard practice and follows guidance from Scottish Renewables ('Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms (2025)'), the principles of which can also be applied to solar farm development.
- 3.3.6 The SEIA will provide an assessment of the potential economic and social impacts the Proposed Development will deliver, as well as identifying potential local and regional community benefits arising from the project. The SEIA will adopt a best-practice and evidence-led approach and will be informed directly by project-specific information alongside the use of relevant economic and wider socio-economic datasets.
- 3.3.7 The SEIA will include:
- A socio-economic baseline review to establish the existing local and regional context for the development, including population, labour market, business and economic characteristics;
 - Assessment of economic impacts associated with the construction phase, including direct employment, Gross Value Added (GVA), salaries and wider supply chain and expenditure effects;

- Assessment of operational and maintenance phase impacts, including direct and indirect employment, GVA and ongoing expenditure effects associated with the operation of the Proposed Development;
- Consideration of decommissioning-related impacts;
- Assessment of indirect and induced economic effects, including consideration of local supply chain opportunities and additionality factors; and
- Consideration of wider social and community benefits, including opportunities relating to employment, skills, training, local procurement and broader social value outcomes.

- 3.3.8 It will set out an assessment of the Proposed Development against NPF4 Policy 11 (Energy) and paragraph (c) in particular: *“Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities”*.
- 3.3.9 The assessment methodology will be informed by the HM Treasury Greenbook, the guidance document for SEIA’s in the UK, and will utilise recognised economic appraisal principles. It will seek to quantify impacts where appropriate/possible, with qualitative impacts, particularly around the social impacts, written up in a distinct section of the report.

Air Quality

- 3.3.10 **Chapter 10 Air Quality** of this EIASR identifies the air quality sensitive receptors of relevance to the Proposed Development. It considers the potential effects that would arise from the construction, operation and decommissioning of the Proposed Development.
- 3.3.11 On the basis that impacts on local air quality during the operational phase can be excluded, and the scale of work involved in decommissioning will be less than during construction, the only assessment required is a Construction Dust Risk Assessment (CDRA) to determine the risk of dust impacts on amenity, human health and ecological sites during the construction phase.
- 3.3.12 The CDRA which is presented in **Chapter 10** demonstrates that without mitigation there is a maximum potential effect of a high risk of dust soiling impacts at sensitive human receptors adjacent to trackout routes and a low risk of dust soiling and human health impacts for all other activities. There is a low risk of effects at ecological receptors.
- 3.3.13 With the implementation of the proposed mitigation, the CDRA concludes that the effect of the Construction Phase dust emissions can be reduced to low risk or negligible and the residual effects are therefore ‘not significant.’ On this basis it is proposed that air quality impacts are scoped out of the EIA.
- 3.3.14 Please refer to **Chapter 10** for further details, including **Section 10.8** which provides a detailed overview of the proposed mitigation measures.

Arboriculture

- 3.3.15 Arboricultural effects are being considered at an early stage in the design iteration process. **Chapter 8** provides an overview of the mitigation measures which will be employed to prevent significant impacts on arboricultural features. Based on the ability to address

significant effects through design, no significant environmental effects are predicted and it is proposed to prepare a separate Arboricultural Report as a standalone report which will outline the findings of the BS5837:2012 complaint survey of all trees. Accordingly it is proposed to **scope out** Arboriculture from the EIAR.

Glint and Glare

- 3.3.16 Based on the potential to address the potential for significant effects on ground and non-ground based receptors through embedded design mitigation as detailed in **Chapter 14 Glint and Glare**, it is recommended that Glint and Glare is **scoped out** of the EIAR. A separate standalone assessment of Glint and Glare during the operational phase will be provided in support of the S36 application.

Materials and Waste

- 3.3.17 The construction of the Proposed Development will involve the use of a range of materials, including lithium-ion components, steel, aggregates, cement-based products, asphalt, timber and plastics. While the extraction and consumption of these resources has the potential to place pressure on finite material supplies and increase demand for raw materials, the Proposed Development will incorporate measures aimed at reducing overall material consumption. These measures will be embedded within the design process and will include optimising material efficiency, minimising resource requirements where practicable, and maximising the use of recycled and secondary materials.
- 3.3.18 Furthermore a Construction Environment Management Plan (CEMP) will identify activities with the potential to generate waste and will apply appropriate waste management measures. These will focus on preventing waste at source wherever possible, alongside promoting the reuse and recycling of materials generated during construction. As a result, impacts associated with material consumption during the construction phase are not expected to be significant and are not proposed for assessment within the EIAR.
- 3.3.19 Prior to construction works commencing, a Site Waste Management Plan (SWMP) will be developed. This document will set out procedures and controls designed to minimise waste generation and maximise opportunities for the recovery, reuse and recycling of materials.
- 3.3.20 The Proposed Development is not expected to produce significant quantities of hazardous waste during either the construction or operational phases. Once operational, waste generation is anticipated to be minimal. At the end of the Proposed Development's operational life, decommissioning activities will seek to recover, reuse and recycle materials wherever feasible. A Decommissioning Environmental Management Plan (DEMP) will also be prepared, incorporating mitigation measures to manage waste streams and reduce any associated environmental effects.
- 3.3.21 Taking account of the proposed design measures, together with the implementation of the SWMP, CEMP and DEMP, the risk of significant effects relating to material use or waste generation is considered to be negligible. Accordingly, materials and waste are not considered likely to give rise to significant environmental effects and have therefore been **scoped out** of the EIAR.

Major Accidents and Hazards

- 3.3.22 The EIA Regulations require EIA Reports to provide a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the

development to risks of major accidents and/or disasters which are relevant to the Proposed Development.

- 3.3.23 'Disaster risk' is defined as a hazard which has potential to incur community losses, encompassing assets, life, health and livelihoods, giving significance to disaster events at a personal and local scale. Disaster risk can also be defined as, hazards which could cause a locality to require assistance from an outside state, which could relate to international aid, or a local authority requiring assistance from another local authority. Typically, disaster events refer to natural occurrences, and are not defined to include events caused by humans.
- 3.3.24 'Accident' can be defined as an undesirable event resulting in damage or harm. Major accidents may give rise to serious injury to people or serious damage to the environment, both close to and further away from the site of the accident. The effect may be immediate or delayed and may sometimes be relatively long lasting, but not necessarily irreversible. According to the 'Control of Major Accident Hazards Regulations' (2015), serious danger to the environment includes accidents with the potential to result in the following:
- "The death or adverse effects on local populations of species or organisms, with lower thresholds for high-value or protected species;
 - contamination of drinking water supplies, ground or groundwater;
 - damage to designated areas, habitats or populations of species within the areas;
 - damage to listed buildings;
 - damage to widespread habitats; and
 - damage to the marine or aquatic environment."
- 3.3.25 The potential impact upon each of these factors would be assessed within the relevant technical chapters of the EIAR where necessary.
- 3.3.26 Given the nature of the Proposed Development, and its location, the risk of a major accident or disaster is considered to be extremely low. A design risk assessment process is followed during the design phase to mitigate risks to a level deemed as low as reasonably practicable as part of the requirements of the Construction (Design and Management) Regulations (2015).
- 3.3.27 During the operational phase of the Proposed Development, routine maintenance inspections will be completed in order to ensure the safe and compliant operation of all built infrastructure.
- 3.3.28 The main risk during the operational phase would be due to an increase in the frequency and intensity of bad weather in particular heavy and extended rain and extreme weather events including storms. Resilience to extreme weather events will be incorporated within the design and construction management process.
- 3.3.29 The Proposed Development and relevant mitigation will be designed to accommodate potential extreme flood events as a result of climate change. Further details will be provided within the Flood Risk Assessment (FRA) submitted with the consent application.

- 3.3.30 The Applicant is an established developer and operator of renewable energy projects and has extensive experience in the management of commercial-scale solar farm development. The Proposed Development will be operated in line with best practice and established industry standards and any risk from factors such as system failure or pollution incidents will be mitigated through implementation of standard industry protocols.

Population and Human Health

- 3.3.31 As established under the EIA Regulations, Population and Human Health is one of the factors that must be considered during the EIA process. The Site design and in-built buffers from sensitive receptors will minimise the risk to human health resulting from the operation of the Proposed Development.
- 3.3.32 Effects on population and human health will be assessed under the respective technical studies considered elsewhere in the EIAR.
- 3.3.33 Any mitigation measures to ensure human safety derived from these assessments will be implemented through the CEMP.
- 3.3.34 Under this approach, it is proposed that Population and Human Health as a factor will be covered through the findings of several other assessments as part of the EIA process and not as a standalone EIA chapter it is therefore proposed to be **scoped out**.

Table 3.1: Summary of Element of Topics Scoped Out

Chapter	Effects Proposed to be Scoped Out of EIAR
Chapter 4 Landscape and Visual Impact	Construction/Operation phase: • Landscape receptors beyond 5km; • Recreational routes and core paths beyond 5km; • Settlements and scattered residents within 5km where there would be no theoretical visibility; and • Other LLAs or landscape designations beyond 5km. Decommissioning phase: • Landscape and visual receptors.
Chapter 5 Archaeology and Cultural Heritage	Construction/Operation phase: • Direct effects upon scheduled monuments, listed buildings and conservation areas; • Changes in the setting of designated heritage assets over 2km from the Site (with the exception of Evelick fort SM3095);

Chapter	Effects Proposed to be Scoped Out of EIAR
	• Changes in the setting of non-designated heritage assets; and • Changes in the setting of designated heritage assets within the outer study area other than those identified in Chapter 5 as potentially being significantly affected – Rait Old Parish Church (Scheduled Monument SM5613); West-Town Church , 230m NNW of Westtown (Scheduled Monument SM5614); Evelick, fort WSE of (Scheduled Monument SM3095); Rait Conservation Area; Inchmartine House (Category A listed building LB13773); Fingask Castle (Category B Listed Building LB11634); Flatfield Farmhouse and Garden Walls (Category B listed building LB10959); Flatfield Steading (Category B listed building LB10960); East Inchmichael Farmhouse and Former Chapel (Category B listed building LB48154); Megginch Castle Inventory Garden and Designed Landscape (GDL00278); Fingask Castle Inventory Garden and Designed Landscape (GDL00179).
Chapter 6 Ecology	All phases of development: • Statutory designated sites for nature conservation greater than 2km, or which standard mitigation/good practice will prevent impacts. • Firth of Tay and Eden Estuary SAC; • Inner Tay Estuary SSSI; • River Tay SAC (except for otter which is scoped in); • Flisk Wood SSSI; • Existing common and widespread habitats of low sensitivity and/ or conservation interest; • Foraging/commuting bats; • Reptiles, impacts on reptiles; • Fisheries; and • Lighting.
Chapter 7 Ornithology	All phases of development: • Inner Tay Estuary SSSI;

Chapter	Effects Proposed to be Scoped Out of EIAR
	- Outer Firth of Forth and St Andrews Bay Complex SPA – except for gull species which are scoped in; - South Tayside Goose Roosts SPA and Ramsar; and - Non-ground nesting bird species (excluding Schedule 1 birds).
Chapter 8 Arboriculture	Chapter scoped out as detailed in Paragraph 3.3.15 above.
Chapter 9 Soils, Geology and Water including Flood Risk	Construction and Operation phases: - Geology; - Inchcoonans GCR and Inchcoonans Claypit SSSI; - Land Capacity for Agriculture; - Peat; - Detailed Drainage Design; and - Water quality monitoring. Decommissioning phase: - All effects.
Chapter 10 Air Quality	Chapter scoped out as detailed in Paragraphs 3.3.10-3.3.14 above.
Chapter 11 Noise and Vibration	Construction phase: - Vibration except where heavy piling works or directional drilling are proposed in proximity to receptors; Operation phase: - Road traffic; and - Vibration. Decommissioning phase: - Noise and vibration.

Chapter	Effects Proposed to be Scoped Out of EIAR
Chapter 12 Traffic and Transport	Operation phase: • All traffic and transport.
Chapter 13 Carbon and Climate	All phases: • Climate change risk to primary components, including flood risk to electrical components and sea level rise; • Intra-project cumulative effects of Climate with other technical topics.
Chapter 14 Glint and Glare	• Chapter scoped out as detailed in Paragraph 3.3.16 above.

3.3.35 The following **Section 3.5** provides an overview of the planning, climate change and energy legislation and policy

3.4 Question for Consultees?

- Can consultees confirm which cumulative developments should be considered by the EIA Report?.

3.5 Planning, Climate Change and Energy Legislation and Policy Context

Introduction

- 3.5.1 This section outlines the relevant Planning, Climate Change and Energy legislation, policy and guidance context, for the Proposed Development.
- 3.5.2 The Proposed Development will comprise 500MW solar and 100MW BESS, and therefore an application will be made to the Scottish Ministers under S36 of the Electricity Act 1989. In this circumstance, the role of the Development Plan is not the same as in applications submitted under the Town and Country Planning (Scotland) Act 1997. The Development Plan does not have primacy in the decision making of S36 applications, but it is a relevant consideration in the determination process.
- 3.5.3 It is proposed that the EIAR will not include a Planning, Climate Change and Energy Legislation and Policy Context Chapter in line with the Scottish Renewables Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms published in September 2025. While the Guidelines refer to Onshore Wind Farms, in the interests of proportionality the Applicant has applied the guidelines to the Proposed Development.
- 3.5.4 The assessment of the Proposed Development against the policy and legislative framework will be undertaken in a standalone Planning Statement which will be separate to the EIAR. Technical topics will however confirm the legislative and policy basis taken into account in their assessment.

Climate Change and Energy Policy

- 3.5.5 The Scottish Government is legally committed to achieve net zero by 2045. The net zero target for Scotland is set out and defined in the Climate Change (Scotland) Act 2009 as amended by the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019.
- 3.5.6 The Climate Change (Scotland) Act 2009 (Scottish Carbon Budgets) Amendment Regulations 2025 implemented the shift from annual/interim percentage targets to multi-year carbon budgets, introduced by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024.
- 3.5.7 The percentage emissions reduction required by each carbon budget is detailed in Scotland's Climate Change Plan: 2026-2040 which was published in March 2026 and is shown as follows:
- “57% lower than 1990 levels for the First Carbon Budget (2026 to 2030).
 - 69% lower than 1990 levels for the Second Carbon Budget (2031 to 2035).
 - 80% lower than 1990 levels for the Third Carbon Budget (2036 to 2040).
 - 94% lower than 1990 levels for the Fourth Carbon Budget (2041 to 2045).”

- 3.5.8 Both the UK and Scottish Governments have produced energy policy documents which include detail on the renewable energy and greenhouse gas (GHG) emission reduction targets and how they plan to achieve them.
- 3.5.9 It is considered the most relevant policy, legislation and guidance published by the UK and Scottish Governments and advisory bodies includes:
- Scottish Government, Energy Strategy (December 2017);
 - Scottish Government's declaration of a Climate Emergency (April 2019);
 - HM Government (previous Conservative Government), The Energy White Paper Powering our Net Zero Future (December 2020);
 - HM Government (previous Conservative Government), Net Zero Strategy: Build Back Greener (October 2021);
 - HM Government (previous Conservative Government), British Energy Security Strategy (April 2022);
 - Scottish Government, Draft Energy Strategy and Just Transition Plan (January 2023);
 - HM Government (previous Conservative Government), Powering up Britain, Energy Security Plan (March 2023) and Powering Up Britain: Net Zero Growth Plan (March 2023);
 - Scottish Government, The Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 (November 2024);
 - Scottish Government, Green Industrial Strategy (September 2024);
 - HM Government, Clean Power 2030 Action Plan (December 2024);
 - Climate Change Committee, The Seventh Carbon Budget (CB7): Advice for the UK Government (February 2025);
 - Scottish Government, Programme for Government 2025-26: Building the Best Future for Scotland (May 2025);
 - Climate Change Committee, Scotland's Carbon Budgets (May 2025);
 - Scottish Government, The Climate Change (Scotland) Act 2009 (Scottish Carbon Budgets) Amendment Regulations 2025 (June 2025);
 - Climate Change Committee, Progress in reducing emissions – 2025 report to Parliament (June 2025); and
 - HM Government, Solar Roadmap: United Kingdom Powered by Solar (June 2025).

- 3.5.10 The Clean Power 2030 Action Plan sets a target of 45-47GW of installed solar capacity for the UK by 2030. According to Solar Power Portal¹, there was a total of 22.1GW of installed solar capacity as of spring 2026, therefore, to meet the Clean Power 2030 Action Plan target, the installed capacity needs to approximately double by 2030.

Development Plan

- 3.5.11 The Development Plan for the Site comprises:

- National Planning Framework 4 (NPF4) adopted 2023; and
- Perth and Kinross Local Development Plan 2 (PKLDP2) adopted on 29 November 2019.

- 3.5.12 Section 24(3) of the Town and Country Planning (Scotland) Act 1997 states:

“In the event of any incompatibility between a provision of the National Planning Framework and a provision of a local development plan, whichever of them is the later in date is to prevail.”

- 3.5.13 Therefore, at present, in this instance, NPF4 would prevail if there is any incompatibility identified between NPF4 and PKLDP2.

National Planning Framework 4

- 3.5.14 The Scottish Government adopted and published NPF4 on 13 February 2023.

- 3.5.15 The NPF4 sets out in its introduction that ‘Scotland’s future places will be Net Zero.’ In Part 1 ‘the National Spatial Strategy’ it also sets out that the Scottish Government’s strategy for Central Scotland (where the Site is located) is to *“provide net zero energy solutions.”*

National Development

- 3.5.16 NPF4 includes a number of national developments which are detailed in Annex B – National Developments Statements of Need. NPF4 (page 99) describes national developments as:

“significant developments of national importance that will help us to deliver our spatial strategy.”

- 3.5.17 The Proposed Development is categorised as a national development as part of National Development 3: Strategic Renewable Electricity Generation and Transmission Infrastructure as it is proposed to exceed 50MW capacity of renewable energy generation.

- 3.5.18 The Need statement for this development states on page 103:

“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. Island transmission connections in particular can facilitate capturing the

¹ <https://www.solarpowerportal.co.uk/solar-installations/uk-surpassed-2-million-solar-installations-in-march-government-figures-show>

significant renewable energy potential in those areas as well as delivering significant social and economic benefits.”

NPF4 Relevant Policies

3.5.19 Whilst NPF4 must be considered in its whole, it is considered that key policy considerations from NPF4 relevant to the Proposed Development include:

- Policy 1 Tackling the climate and nature crises;
- Policy 2 Climate mitigation and adaptation;
- Policy 3 Biodiversity;
- Policy 4 Natural places;
- Policy 5 Soils;
- Policy 6 Forestry, woodland and trees;
- Policy 7 Historic assets and places;
- Policy 11 Energy;
- Policy 12 Zero waste; and
- Policy 22 Flood risk and water management.

3.5.20 Policy 11 is considered the lead policy within NPF4 for renewable energy developments.

3.5.21 Policy 11 is supportive of all forms of renewable, low-carbon and zero carbon technologies which includes solar arrays and energy storage.

Local Development Plan

3.5.22 The PKLDP2 sets out the spatial strategy and land use planning framework for the area covered by PKC. Policy 33A: New Proposals for Renewable and Low-Carbon Energy is the renewable energy policy. The following PKLDP2 policies will be reviewed and an assessment undertaken where they are compatible with the relevant prevailing policy provisions as set out in NPF4:

- Policy 1: Placemaking;
- Policy 2: Design Statements;
- Policy 14A: Existing Areas;
- Policy 15: Public Access;
- Policy 26B: Archaeology;

- Policy 33A: New Proposals for Renewable and Low-Carbon Energy;
- Policy 38A: Environment and Conservation;
- Policy 39: Landscape;
- Policy 40: Forestry, Woodland and Trees;
- Policy 41: Biodiversity,
- Policy 42: Green Infrastructure;
- Policy 50: Prime Agricultural Land;
- Policy 51: Soils;
- Policy 52: New Development and Flooding;
- Policy 53A: Water Environment;
- Policy 53C: Surface Water Drainage; and
- Policy 56: Noise Pollution.

National Planning Guidance

3.5.23 National planning guidance and advice are relevant considerations to the Proposed Development. Those which are considered to be most applicable to the Proposed Development are listed below:

- Battery Energy Storage Systems: planning Guidance (Scottish Government, March 2026);
- Biodiversity: planning guidance (Scottish Government, December 2025);
- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011); and
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013).

3.6 Questions to Consultees

- Can consultees please confirm if there is any other legislation, policy and guidance which is relevant and not listed within the Scoping Report?

4 LANDSCAPE AND VISUAL IMPACT

4.1 Introduction

- 4.1.1 The Landscape and Visual Impact Assessment (LVIA) chapter of the Environmental Impact Assessment Report will consider direct and indirect effects on landscape resources, landscape character and designated landscapes. It will examine the nature and extent of effects on existing views and visual amenity. The effects of the Proposed Development, including ancillary infrastructure such as access tracks, fencing and CCTV, will be assessed during the construction, operational and decommissioning phases. The LVIA will also consider cumulative effects: the incremental effects of the Proposed Development in combination with other energy developments.
- 4.1.2 The LVIA will inform modifications and refinements to the layout design and will be undertaken following the approach set out in Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3). The assessment will also draw upon current good practice guidance published by NatureScot, as listed in **Paragraph 4.2.2**.
- 4.1.3 The Proposed Development is subject to ongoing review and design evolution and is described in **Chapter 2: Project Description**. It is also noted in **Chapter 2** that a series of potential additional options for PV, underground cables and habitat mitigation may be included within the Proposed Development (allocations shown as Indicative Underground Cable Route Corridor, Potential Additional Option for Habitat Mitigation and Underground Cable Route, and Potential Additional Option for PV). Where this has the potential to influence the scope of the LVIA, this has been noted. As the design progresses further consultation will be undertaken to ensure a robust scope of assessment.

4.2 Policy and Guidance

Policy

- 4.2.1 Relevant policy considerations are contained in the following documents:
- Scottish Government, 4th National Planning Framework, 2023;
 - Perth and Kinross Council (PKC) (2019) Perth and Kinross Local Development Plan 2 (PKLDP2); and
 - PKC (2020) Adopted Landscape Supplementary Guidance.

Guidance

- 4.2.2 The LVIA will be undertaken in accordance with the following best practice guidance:
- Landscape Institute (LI) and the Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3);

- Landscape Institute (2019) Technical Guidance Note 2/19 Residential Visual Amenity Assessment;
- Landscape Institute (2021) Technical Guidance Note 02/21 Assessing landscape value outside national designations;
- Landscape Institute (2019) Technical Guidance Note 6/19 Visual Representation of Development Proposals;
- Natural England (2014) An Approach to Landscape Character Assessment;
- Natural England (2019) An Approach to Landscape Sensitivity Assessment; and
- NatureScot (2022) Landscape Sensitivity Assessment.

4.2.3 Along with current guidance, the LVIA will be undertaken in accordance with emerging guidance, if adopted at the time of writing the report. Such guidance includes:

- PKC (2025) Draft Renewable & Low Carbon Energy Planning Guidance.

4.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

Study Area

- 4.3.1 To assist in the determination of an appropriate and proportionate study area for the LVIA, preliminary Zone of Theoretical Visibility (ZTV) plans have been prepared, and these are shown on **Figure 4.1: Bare Earth ZTV** and **Figure 4.2: Landscape Context with Screening ZTV**. The ZTVs illustrate the reasonable worst-case scenario of visibility for various elements of the Proposed Development based on the maximum parameters. The purpose of the ZTVs at this scoping stage is simply to identify the maximum possible extents of visibility and to help identify potential visual receptors.
- 4.3.2 The initial ZTVs are based on maximum heights of 10.2m for the substation, and 3.5m for the solar PV panels. The ZTV for the proposed substation and Battery Energy Storage System (BESS) area assumes the preferred land parcel at the maximum substation height of 10.2m. Although the ZTV is based on maximum heights at this stage, it is anticipated that these would reduce as part of an iterative process of design development. A revised ZTV will be prepared as part of the LVIA.
- 4.3.3 It should be noted that the ZTVs presented in **Figure 4.2** take account of the screening effect of significant blocks of woodland, some linear tree belts and buildings; but do not take account of walls, hedgerows, smaller tree lines, or tree groups. As is typical for all such ZTVs, the visibility shown on the plans is exaggerated and the actual extent of visibility of any development on the Site would be considerably more constrained than is indicated on these preliminary ZTVs. The Potential Additional Solar Areas 1 and 2 have been included in the ZTVs as a separate layer.
- 4.3.4 Based on analysis of the ZTVs (**Figures 4.1** and **4.2**) and field work undertaken to date, it is noted that there may theoretically be views of the solar PV modules or Project Substation /

BESS beyond 5km of the Site boundary. Assessment of similar projects (such as the 800MW Springwell solar project) has shown that visibility beyond 5km would most likely not be significant. It is therefore proposed, based on a review of similar projects and professional judgement, that a 5km study area offset from the boundaries of the Site is proportionate for the consideration of landscape and visual effects arising as a result of the solar PV modules and Project Substation / BESS. The study area proposed is considered adequate to identify any significant effects on landscape and visual receptors. Whilst there may be glimpses of the Proposed Development beyond 5km, it is not considered that landscape or visual effects arising would be significant due to distance.

- 4.3.5 It is therefore proposed that the initial study area and the main focus of the LVIA will be within 5km of the Site boundary.

Site Location and Context

- 4.3.6 The Site location is described in detail in **Chapter 2: Project Description**. The Proposed Development Site lies in an area of predominantly lowland agricultural and grazing land approximately 11km east of Perth and 9km southwest of Dundee, broadly between the settlements of Inchtute, Errol and Rait.
- 4.3.7 The Site is situated within relatively level open land interspersed with linear tree belts and small woodland blocks either side of the A90 between Perth and Dundee. The surrounding area is sparsely settled, with two principal landscape types.
- 4.3.8 To the south is an area of largely flat, low-lying land extending to the banks of the River Tay known as the Carse of Gowrie.
- 4.3.9 To the north the landscape is characterised by the contrasting steep south-facing slopes of the Sidlaw Hills, which within the LVIA study area is known as The Braes of the Carse. The Sidlaw Hills form a locally prominent northeast to southwest oriented feature, contributing to the wider pattern of parallel landscape elements including the Firth of Tay, the Ochil Hills in Fife, and Strathmore to the north.
- 4.3.10 Recreational routes are largely focused on the village of Errol and to the slopes of the Sidlaw Hills. These comprise a network of core paths and routes along quiet rural roads where views of the Sidlaw Hills and the River Tay contribute to the scenic quality of the landscape. Routes within the hills allow access to vantage points that offer long-range views across the Carse of Gowrie and the Firth of Tay, towards Fife. The path network south of Errol provides links to the Tay Reedbeds Nature Reserve, managed by the RSPB.
- 4.3.11 Built infrastructure within the immediate context of the Site includes the A90 dual carriageway, the Dundee-Perth railway line and parallel 275kV and 132kV overhead transmission lines between Dundee and Abernethy substation. The former RAF Errol site is now used as an industrial complex with a range of business and laydown areas. Agricultural polytunnels occupy some land parcels between Errol and Port Allen, and to the west of Grange.

Landscape Character

- 4.3.12 The Site is within NatureScot Landscape Character Area Type (LCT) 385: Firth Lowlands. The LCT is described as a predominantly flat, fertile area enclosed by the abrupt change of slope to the steep Sidlaw escarpment to the north, which emphasises the overriding

horizontal landscape character of the flat plain of the Firth of Tay to the south. Land use is described as predominantly comprising large, rectangular, intensively farmed fields. To the south this LCT is characterised by estuarine reed-beds and mudflats, creating a softer natural fringe to the Tay Estuary, which contrasts with the intensively managed adjacent geometric mosaic of fields.

4.3.13 Adjacent character areas withing the proposed 4km study area include:

- LCT 382 Lowland Hill Ranges, which encompasses the Sidlaw Hills;
- LCT 192 Coastal Hills – Fife; and
- LCT 184 Foothills – Fife.

Visual Amenity

4.3.14 The Site is located within relatively open and flat farmland where long-range views across the landscape are occasionally interrupted by linear belts of trees and small woodland blocks. Potential visual effects would occur from the following receptors:

- Nearby settlements including Grange (immediately south), Inchtute (0.1km east), Rait (0.2km north), Kinnaird (0.2km north), Errol (0.25km south), Longforgan 3km east, St Madoes 4.7km southwest, Newburgh 4.7km south, Kilspindie 0.3km northwest, and Ballindean 0.3km north;
- Key routes: A90, A913 and Dundee-Perth Railway, National Cycle Route (NCN) 77 and NCN 777; and
- Recreational routes and places of interest, including the core path network (particularly around Errol, Inchtute and the Sidlaw Hills); Fife Coast Path; Taybank Circular Walk; viewpoints within the Sidlaw Hills and high ground in Fife; Tay Reedbeds Nature Reserve.

Viewpoints and Visualisations

4.3.15 The assessment will be supported by a number of representative viewpoints. The list of viewpoint locations proposed to be included are detailed in **Table 4.1** below and illustrated on **Figures 4.1 and 4.2**. Not all viewpoints have been 'ground truthed' at this stage, so grid references are approximate, and locations may be micro-sited to obtain the most representative view or greatest extent of views.

4.3.16 The assessment will be supported by a series of photomontages and photowires from agreed viewpoint locations. Visualisations from each viewpoint will be prepared in accordance with TGN06/19 Visual Representation of Development Proposals.

Table 4.1: Representative Viewpoints

ID	Viewpoint Name	Easting, Northing	Distance to Site (km)	Receptors	Visualisation Type
1	North Grange	327104, 726210	0km	Residents, track users	LI Type 3 Photomontage
2	Grange	327045, 725871	0km	Residents, road users	LI Type 3 Photomontage
3	West Grange	326782, 725609	0km	Residents, road users	LI Type 3 Photomontage
4	Horn Road	325049, 726408	0.1km	Residents, road users	LI Type 3 Photomontage
5	Fingask Castle (core path ITUR/121)	322994, 727031	0.1km	Residents, recreational receptors within LLA, road users	LI Type 3 Photomontage
6	Craigdallie	324914, 728788	0km	Residents, core path users	LI Type 3 Photomontage
7	Elm Street, Errol	324984, 723130	0.2km	Residents, core path users	LI Type 3 Photomontage
8	Cycle Route 77, East Leys	326019, 724008	0.3km	Residents, cycle route users; tourism receptors	LI Type 3 Photowire
9	Viewlands Place, Errol	325664, 723162	0.3km	Residents, road users	LI Type 3 Photomontage
10	Pow of Errol (core path EROL/104)	325983, 722763	0.3km	Core path users	LI Type 3 Photowire
11	South Bank, Errol	325368, 722742	0.3km	Residents, road users	LI Type 3 Photowire
12	Inchmichael	325095, 725338	0.3km	Residents, road users	LI Type 3 Photowire
13	Balgay	326871, 727308	0.4km	Residents, road users	LI Type 3 Photowire
14	Core Path (EROL/115) south of Megginch	324470, 724102	0.5km	Recreational receptors, train users	LI Type 3 Photowire
15	Guardswell Farm	325062, 729387	0.5km	Road users, tourism receptors, recreational receptors within LLA	LI Type 3 Photomontage
16	Eastern Ballindean	326628, 729391	0.7km	Core path users, road users, recreational	LI Type 3 Photowire

ID	Viewpoint Name	Easting, Northing	Distance to Site (km)	Receptors	Visualisation Type
				receptors within LLA	
17	Pitmiddle	324721, 729775	1km	Core path users, tourism receptors, road users	LI Type 3 Photowire
18	Powgavie	328688, 726310	1km	Residents, cycle route users, road users	LI Type 3 Photowire
19	Kilspindie	321356, 725995	1.4km	Residents, recreational receptors within LLA, road users	LI Type 3 Photowire
20	Fife Coastal Path	326587, 719277	3.4km	Fife coastal path users, core path users, recreational receptors within LLA	LI Type 3 Photowire
21	Megginch	324092, 724913	0km	Residents, recreational receptors	LI Type 3 Photowire

Landscape Designations

- 4.3.17 There are no national landscape designations within the study area or within 20km of the Site.
- 4.3.18 The Site area to the north of the A90 and most of the northwestern part of the study area coincides with the Sidlaw Hills Local Landscape Area (LLA). This LLA includes the Sidlaw Hills and part of the Carse of Gowrie. The Sidlaws are a range of hills dividing the Firth of Tay from the agricultural landscape of Strathmore to the north of the LVIA study area. The Braes of the Carse that form the southern flank of this LLA provide a dominant backdrop to the adjacent Carse of Gowrie.
- 4.3.19 Perth and Kinross' adopted non-statutory Landscape Supplementary Guidance 2020 identifies seven special qualities. The LVIA will assess the potential impacts on the relevant special qualities.
- 4.3.20 The Tay Coast LLA within Fife occupies a long band of low hills and coastal landscape between 4-5km south of the Site, bordering the southern shores of the Firth of Tay and extending from Newport on Tay to Newburgh. The Proposed Development will not result in any direct change to the physical fabric character of this LLA or most of the qualities for which it is designated. The LVIA will consider any potential impacts on the scenic qualities experienced from parts of this LLA where there is theoretical visibility. The proposed Viewpoint 19 would be located on the Fife Coastal Path within this local designation.
- 4.3.21 There are several designated Garden and Designed Landscape (GDL) within the study area, including Megginch Castle, Fingask Castle, Errol Park, Rossie Priory, and Glendoick.

- 4.3.22 GDLs are designated for their cultural heritage importance rather than just their scenic quality. In respect of the LVIA these areas will be considered as indicators of increased landscape value, while effects on the setting and cultural heritage value of these will be considered within the Cultural Heritage assessment.

Design Considerations

- 4.3.23 The landscape and visual considerations summarised below have informed the initial scoping layout and will continue to inform design considerations as an iterative process of design and assessment:
- Siting of PV panel infrastructure away from the closest residential properties;
 - Orientation and location of the PV panels in response to landscape and visual integration, for example, through the use of existing shelter belts for screening;
 - Appreciation of existing landscape patterns and features and how these can be integrated and enhanced as part of the design process of the Proposed Development;
 - Minimise views of electrical infrastructure in sequential views from key routes and the recreational core path and National Cycle Route network;
 - Siting of infrastructure and the development of landscape mitigation measures to aid landscape integration and reduce the potential impacts on identified special qualities and views from elevated locations within the Sidlaw Hills LLA and Tay Coast LLA; and
 - Opportunities for integrated landscape and ecology mitigation to improve, restore and or enhance local green infrastructure networks and habitats, whilst not compromising the energy generation capacity of the PV development.
 - Consideration of potential to enhance and create new recreational routes, particularly where the core path network is more limited.
 - Landscape reinstatement of indicative cable corridors.
 - Consideration of any further mitigation, restoration of enhancement opportunities should any of the Potential Additional Option for PV areas be later included in the Proposed Development.

4.4 Consultation

- 4.4.1 No consultation to inform the Landscape and Visual Impact Assessment (LVIA) has been undertaken to date.
- 4.4.2 Following submission of the Environmental Impact Assessment Scoping Report (EIASR), discussions will be held with PKC to agree the finer detail of the LVIA. Agreement will be sought on a selection of assessment viewpoints to be used in the LVIA, including the illustrative techniques to be used for any visualisations of the Proposed Development.

4.5 Survey and Assessment Methodology

- 4.5.1 The LVIA will be informed by a combination of desk-based analysis, Site surveys viewpoint photography and visualisations undertaken in accordance with best practice guidance documents previously listed.

Surveys

- 4.5.2 LVIA surveys have informed scoping and will continue throughout design development and at design freeze. Surveys will include viewpoint photography from the representative viewpoints identified in **Table 4.1**.
- 4.5.3 Further Site visits will be undertaken in summer and autumn 2026 to photograph the baseline views from a range of locations (viewpoints) within and surrounding the Site to represent a range of views and visual receptors of the Site. The location of the viewpoints will be agreed through further consultation with statutory consultees.
- 4.5.4 Where possible and subject to access to private property being agreed, visits will also be made to selected residential properties within approximately 200m of the proposed solar PV panels and 500m from the proposed substation, to assess the potential for visual effects on residential amenity.

Assessment Methodology

- 4.5.5 The purpose of Landscape and Visual Impact Assessment (LVIA) when produced in the context of an Environmental Impact Assessment Report (EIAR) is to identify and report any likely significant landscape and visual effects.
- 4.5.6 The following sets out the key parts of the full LVIA methodology and criteria against which the assessment of landscape and visual effects will be undertaken. The full LVIA methodology will be provided as an appendix to the EIAR.
- 4.5.7 The Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3) are widely recognised as the primary source of guidance for LVIA in the UK but clearly state that:
- "The guidance concentrates on principles while also seeking to steer specific approaches where there is a general consensus on methods and techniques. It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances."* (paragraph 1.20)
- 4.5.8 Landscape and Visual Assessments are separate, though linked processes which GLVIA3 notes are *"related but very different considerations"*. The assessment of the potential effect on the landscape will be carried out as an effect on the environmental resource (for example, the landscape). Visual effects will be assessed as an inter-related effect on people.
- Landscape effects derive from changes in the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.

- Visual effects relate to changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes and to the overall effects with respect to visual amenity.

Landscape Sensitivity

- 4.5.9 It should be noted, as stated in GLVIA3, "*LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning but is not the same as it is specific to the particular project or development that is being proposed and to the location in question.*" (paragraph 5.39).
- 4.5.10 In LVIA, landscape sensitivity is assessed by combining judgements about the value attached to a landscape, its susceptibility to the type of change and nature of the development proposed. The overall sensitivity of the landscape to a particular development will be described in the LVIA as high, medium or low.
- 4.5.11 Sensitivity will be evaluated taking into account the component judgements about the value and susceptibility of the receptor. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted. Note that equal weighting will be attributed to susceptibility and value when determining overall landscape sensitivity.

Magnitude of Landscape Effect

- 4.5.12 The magnitude of landscape effect arising from the Proposed Development at any particular location will be assessed in terms of "*size or scale, the geographic extent of the area or receptor that is influenced and its duration and reversibility*" (paragraph 5.48). Magnitude of effect will be considered taking into account the three contributory factors as illustrated by the diagrams in **Plate 1** below.

Visual Effects

- 4.5.13 In accordance with GLVIA3, the significance of visual effects will be determined by combining judgements regarding the sensitivity of visual receptors (people who view the landscape) and the magnitude of the change they experience arising from the Proposed Development.

Visual Receptor Sensitivity

- 4.5.14 In visual assessment, visual receptor sensitivity is assessed by combining judgements about the value attached to views and the susceptibility of the viewer to the type of change and nature of the development proposed. The overall sensitivity of the visual receptor to a particular development will be described in the LVIA as high, medium or low.
- 4.5.15 Sensitivity will be evaluated taking into account component judgements about the value and susceptibility of the receptor as illustrated by **Table 4.2 below**. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted. Note that a greater weight is intentionally attributed to the susceptibility of the visual receptor than to value. This is in recognition of the fact that relatively few views are specifically recognised through designation or cultural reference. This approach still acknowledges that value associations influence sensitivity.

Table 4.2: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High	Local residents; tourists; people engaged in outdoor recreation focused on an appreciation of views including users of footpaths and quiet country lanes, beauty spots and picnic areas and people experiencing views to or from important features of physical, visual, cultural or historic interest.
Medium	Local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape, for example, road cycling, nature conservation, golf and water based recreation.
Low	Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

Magnitude of Visual Effect

- 4.5.16 The magnitude of visual effect arising from the Proposed Development will be assessed in terms of its size or scale, geographic extent of the area or receptor that is influenced and its duration.
- 4.5.17 Representative viewpoints will be used in the LVIA as ‘samples’ on which to base judgements of the scale of change experienced by visual receptors. The wider extent of the effect and its duration are not captured in viewpoint analysis (as a viewpoint cannot capture these factors for an entire route or area). As duration and extent are necessary considerations in determining magnitude of change, judgements concerning magnitude and significance will be provided for visual receptors and not for representative viewpoints. The only exception to this would be a specific viewpoint, where people visiting that location to look at the view are assessed as a visual receptor group in its own right.
- 4.5.18 Magnitude of effect will be considered taking into account the three contributory factors as illustrated by the diagrams in **Plate 1** below.

Significance of Effect

- 4.5.19 The significance of any identified landscape or visual effect will be assessed as major, moderate, minor or negligible. These categories are based on the consideration of sensitivity with the predicted magnitude of change. The plate below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Plate 1: Combining Scale of Change, Extent and Duration to Determine Magnitude of Landscape and Visual Effects

Stage 1 - Modifying Influence of Geographic Extent on Magnitude of Effect

		Scale of Change			
		Large	Medium	Small	Negligible
Geographic Extent	Wide	Substantial			
	Intermediate		Moderate		
	Localised			Slight	
	Limited				Negligible

Stage 2 - Modifying Influence of Duration on Magnitude of Effect

		Stage 1 Result			
		Substantial	Moderate	Slight	Negligible
Duration	Permanent	Substantial			
	Long-term		Moderate		
	Medium-term			Slight	
	Short-term				Negligible

Significance of Landscape and Visual Effects

- 4.5.20 The significance of any identified landscape or visual effect will be described as major, moderate, minor or negligible. These categories are based on the consideration of receptor sensitivity with the predicted magnitude of effect. **Table 4.3** below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.
- 4.5.21 Where the effect has been classified as Major or Major/Moderate, this will be considered equivalent to a likely significant effect. Where 'Moderate' effects are predicted, professional

judgement will be applied to determine whether the effect is significant or not, ensuring that the potential for significant effects to arise is thoroughly considered and justification is provided for the judgement reached as appropriate. Effects of moderate/minor, minor, minor/negligible or negligible significance will not be considered as significant.

Table 4.3: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major/ Moderate	Moderate	Minor
Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ Negligible
Low	Moderate	Moderate/ Minor	Minor	Negligible

Beneficial/Adverse

- 4.5.22 Landscape and visual effects can be beneficial or adverse and, in some instances, may be considered neutral. Neutral effects are those which overall are neither adverse nor beneficial but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA3 indicates at paragraph 2.15 that this is a "*particularly challenging*" aspect of assessment, especially in the context of a changing landscape.
- 4.5.23 However, for the avoidance of doubt, the assessment will assume that where new infrastructure is introduced into the landscape or views, this will generally constitute an adverse effect. Any variation from this stance will be clearly justified.

Cumulative Assessment

- 4.5.24 In a broad generic sense, cumulative impacts "*result from the incremental changes caused by other past, present or reasonably foreseeable actions together with the project*" However, an assessment of cumulative effects should focus on whether there are any potential cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making of the Proposed Development, rather than an assessment of every potential cumulative effect. In practice, this means focusing on other nearby development proposals and the effects that might arise from the combined influence of those developments on landscape and visual receptors.
- 4.5.25 As recommended by the NatureScot cumulative guidance, the cumulative assessment of landscape and visual effects will focus on the "*additional cumulative change which would be brought about by the proposed development*".
- 4.5.26 Operational developments will be included in the baseline. Consented development, which are expected to be constructed, will form part of the future baseline and will be included as such. However, where there is some uncertainty regarding the future construction of consented developments, these may be considered as the first scenario of the cumulative assessment.

4.5.27 Proposals in planning will be considered where there is good reason to assume that the timing of decisions may be similar and significant cumulative effects are likely. The assessment of effects will be considered within the cumulative assessment.

4.5.28 Proposals in scoping will be noted but not considered within the cumulative assessment, as there is no certainty that these proposals will progress to planning submissions and the nature of the proposed schemes may be subject to change.

Residential and Visual Amenity

4.5.29 As set out within LI Technical Guidance Note 02/19 'Residential Visual Amenity Assessment (RVAA)':

'Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' And

'It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.'

4.5.30 The LVIA will present, as an appendix to the main assessment, a residential amenity assessment of visual effects on residential properties for any property where there is a possibility that the visual effects may approach the threshold described above.

Visuals Methodology

4.5.31 The full visuals/ photomontage methodology will be provided as an appendix to the LVIA and summarised below.

4.5.32 All photography presented in the LVIA will be taken in accordance with guidance outlined in Landscape Institute Technical Guidance Note 06/19. Photography will be obtained using a Canon EOS R8 digital SLR camera with a full frame sensor and high quality fixed 50mm focal length lens. At each viewpoint, a series of photographs (landscape orientation) will be taken to capture a 360 degree panorama.

4.5.33 For each of the viewpoints, photographs will be stitched and presented as panoramas. Photographs have been stitched using PTGui software.

Visualisations: Photomontages and Photowires (LI Type 3)

4.5.34 A selection of the viewpoints will be selected to be used as photomontages. For each chosen viewpoint, a montage will be produced as either:

- Photowire - stitched and matched photo with wireline showing Site details, or;
- a Photomontage: for Year 1 (showing the Site immediately after construction) and at year 10 (showing the effects of any mitigation strategies).

4.5.35 For the photomontages, a 3D model of the Site will be constructed from the Site plan in Sketchup. This model will include the solar PV panels alongside any Site infrastructure

(fences, tracks, BESS, CCTV). Where visible the substations will also be included in the montages.

- 4.5.36 Cameras are set up in the 3D model to match the location and time of the photography. The 3D model is rendered in V-Ray for Sketchup and then composited into the photograph in Adobe Photoshop. Mitigation is also added to the Sketchup model and rendered to provide the Year 10 montages.

4.6 Potential Significant Effects

- 4.6.1 Landscape effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2 as follows:

“An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner.”

- 4.6.2 At this stage, prior to any formal assessment and the final design freeze, it is acknowledged that there is the potential for significant landscape and visual effects to arise during construction, operation and decommissioning.

- 4.6.3 The LVIA will therefore consider the potential effects upon:

- Landscape fabric;
- Landscape character;
- Published special qualities and characteristics of Local Landscape Designations; and
- Visual receptors including residential, transport and recreational receptors.

- 4.6.4 Initial ZTVs have been undertaken to 5km in order to identify receptors for inclusion in further study. As stated in **Section 4.3**, based on Site analysis to date and previous experience of assessing the significance of landscape and visual effects for solar farms in similar landscapes, it is considered likely that any significant landscape and visual effects arising from the Proposed Development would be limited to within a distance of approximately 5km.

Table 4.4: Summary of Receptors Scoped In

Receptor/Element	Phase	Justification
LCT 385 Firth Lowlands	Construction, Operation, Decommissioning	Parcels to the south of the A90 are located within this LCT and there is likely to be a large scale of change to characteristics within part of this LCT.
LCT 382 Lowland Hills Ranges	Construction, Operation, Decommissioning	Parcels to the north of the A90 are located within this LCT and there is likely to be a large scale of change to characteristics within part of this LCT.

Receptor/Element	Phase	Justification
LCT 192 Coastal Hills Fife	Construction, Operation, Decommissioning	Rising ground to the south of the Firth of Tay from where there is potential to be an indirect, large scale of change to characteristics of the landscape
Settlements and residents within 4km including Grange, Inchtute, Rait, Kinnaid, Errol, Longforgan, Kilspindie, and Ballindean	Construction, Operation, Decommissioning	Higher sensitivity receptors which may have views of the Proposed Development.
Key routes within 4km: A90 and Dundee & Perth railway	Construction, Operation, Decommissioning	Users of key routes which may have sequential views of the Proposed Development
Recreational routes and places of interest including within 4km: Fife Coast Path, core path networks (around Errol and Inchtute, within Sidlaw Hills, along northern bank of Tay, higher ground to the south of Tay); National Cycle Network 77 and 777; Tay Reedbeds Nature Reserve.	Construction, Operation, Decommissioning	Higher sensitivity receptors which may have views of the Proposed Development. The ZTV indicates varying levels of theoretical visibility.
Sidlaw Hills LLA	Construction, Operation, Decommissioning	Proposed Development located partly within this LLA. Widespread visibility from south-facing hills of the agricultural lowlands.
Tay Coast LLA	Construction, Operation, Decommissioning	Depending on the final layout and design of the Proposed Development, there may be views of the Proposed Development and impacts on the scenic aspects of this LLA
Properties within 200m of PV array and 500m of the substation (considered as part of the Residential Visual Amenity Assessment)	Construction, Operation, Decommissioning	The Proposed Development would be visible from the closest residential properties to the Stie where the scale of change has the potential to be substantial. The RVAA will be undertaken in accordance with the methodology set out.

Assessing Potential Significant Effects from the Potential Additional Option Areas and Indicative Underground Cable Route Corridor

- 4.6.5 The landscape and visual receptors scoped into the EIAR are based on the Proposed Development as set out in **Chapter 2: Project Description**. The Potential Additional Options for PV and mitigation areas and Indicative Underground Cable Route Corridor are unlikely to introduce additional sources of impact. However, the overall spatial extent of impacts would increase which may influence the significance of effect from some landscape and visual receptors. Should any of these be considered as part of the Proposed Development at the EIA phase, the scope of the LVIA would be amended and agreed through consultation.

4.7 Approach to Mitigation

Construction

- 4.7.1 Consideration will be given to the Site selection for compounds and equipment laydown areas to minimise landscape and visual effects as far as practicable. However, there is expected to be limited potential for secondary mitigation of short-term landscape and visual construction effects.
- 4.7.2 Lighting of any construction compounds will be designed to minimise visual intrusion.
- 4.7.3 Existing trees, woodlands and hedgerows would be protected in accordance with best practice for construction in proximity to trees and in accordance with relevant British Standards.

Operation

- 4.7.4 A high-quality design will be secured firstly through careful Site selection for the various components of the Proposed Development, taking account of the potential landscape and visual effects. Removal or disruption to any existing landscape fabric such as trees and hedgerows will be minimised to that which is absolutely necessary for the implementation of the Proposed Development.
- 4.7.5 A detailed landscape and habitat mitigation strategy will be developed in accordance with the principles of good design, to integrate the Proposed Development into the landscape and mitigate visual effects as far as practicable. The landscape strategy will be complementary to any biodiversity and other environmental objectives. The landscape design will seek to deliver landscape enhancements over and above the requirement to simply mitigate adverse effects.
- 4.7.6 The landscape strategy will seek to manage and restore existing vegetation and habitats within the Site as well as implement the planting of extensive areas of new native vegetation and creation of new biodiverse habitats.
- 4.7.7 A landscape and ecological management plan (LEMP) will be developed in consultation with relevant consultees to secure the long-term management of the landscape and biodiversity strategy.

Decommissioning

- 4.7.8 This stage of the development will be similar to the construction stage, albeit in reverse whereby the dismantled equipment will need storing within the Site prior to removal. Given the anticipated Operational duration (40 years), mitigation landscaping will have reached maturity and short-term landscape and visual decommissioning effects will be more filtered and/or screened than at the Construction stage. No secondary mitigation is envisaged during this phase.

4.8 Matters Scoped Out

Table 4.5: Matters Scoped Out

Receptor/Element	Phase	Justification
Landscape receptors (LCTs) beyond 5km	Construction/ Operation	Although the ZTVs indicate some distant visibility from other LCTs, field work has established that there would be limited intervisibility between the Site and any other LCTs.
Recreational routes and core paths beyond 5km	Construction/ Operation	Views of the Proposed Development beyond this distance would be very limited and not likely to result in effects which would reach the threshold of a significant effect.
Settlements and scattered residents within 5km where there would be no theoretical visibility	Construction/ Operation	It is unlikely that there would be any views of the Proposed Development where there is no theoretical visibility and therefore not likely to result in effects which would reach the threshold of a significant effect.
Other LLAs or landscape designations beyond 5km	Construction/ Operation	Despite the fact that the ZTVs indicate some distant visibility from other LLAs, field work has established that there would be limited intervisibility between the Site and any other LLAs.
Landscape and visual receptors	Decommissioning	Similar to construction phase effects. Construction phase effects considered as the reasonable worst-case scenario.

4.9 Questions to Consultees

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study area?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/viewpoints/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed mitigation approach/measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?

4.10 References and Guidance

- Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment (2013)
- Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals, published by the Landscape Institute (2019)
- Landscape Institute Technical Guidance Note 02/21: Assessing landscape value outside national designations
- Landscape Institute Technical Guidance Note 02/19: Residential Visual Amenity Assessment
- Landscape Institute Technical Guidance Note 04/20: Infrastructure
- PKLDP2, (2019) PKC
- PKLDP2 Web Map, available at: <https://perth-kinross.maps.arcgis.com/> . PKC (Accessed 24.04.2026)
- Perth and Kinross Landscape Supplementary Guidance (2020), PKC
- PKC (2025) Draft Renewable & Low Carbon Energy Planning Guidance
- FIFEplan (2017). Fife Council

5 ARCHAEOLOGY AND CULTURAL HERITAGE

5.1 Introduction

- 5.1.1 This Archaeology and Cultural Heritage chapter of the Environmental Impact Assessment Scoping Report (EIASR) has been prepared by Turley (Heritage). It sets out details of the work carried out to date to understand the baseline conditions within the Site and its surroundings. It then sets out the proposed scope for the archaeology and cultural heritage assessment, and the proposed assessment methodology.

5.2 Legislation Policy and Guidance

- 5.2.1 The following legislation, policy and guidance relating to archaeology and cultural heritage is relevant to the Proposed Development and will be taken into account during the ongoing impact assessment process.

Legislation

- 5.2.2 The scoping assessment has been undertaken in accordance with the following legislation:

- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act (UK Parliament, 1997); and
- Ancient Monuments and Archaeological Areas Act (UK Parliament, 1979).

Policy

- 5.2.3 The scoping assessment has been undertaken in accordance with the following national and local policy:

- National Planning Framework 4 (The Scottish Government, 2025);
- Historic Environment Policy Scotland (The Scottish Government, 2019); and
- Perth and Kinross Local Development Plan 2 (Perth and Kinross Council, 2019).

Guidance

- 5.2.4 The scoping assessment has been undertaken in accordance with the following guidance:

- Environmental Impact Assessment Handbook. Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment

Process in Scotland (Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES) 2018)²;

- Managing Change in the Historic Environment: Setting (HES, 2019);
- Managing Change in the Historic Environment: Gardens and Designed Landscapes (HES, 2016);
- Principles of Cultural Heritage Impact Assessment (Institute of Historic Building Conservation (IHBC), Chartered Institute for Archaeologists (CIfA) & Institute of Environmental Management and Assessment (IEMA), 2021);
- Guidelines on Streamlining Environmental Impact Assessment for Onshore Windfarms (Scottish Renewables, September 2025);
- Design Manual for Roads and Bridges (DMRB), LA 104 Environmental assessment and monitoring (Standards for Highways 2020) and LA 106 - Cultural Heritage Assessment (Standards for Highways Jan 2020);
- Landscape Institute, Visual Representation of Development Proposals, Technical Guidance Note 06/19 (September 2019); and
- Standard and guidance for historic environment desk-based assessment (CIfA, 2017).

5.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 5.3.1 Full details of the existing baseline conditions are set out in the Initial Cultural Heritage Appraisal (**Appendix 5.1**) and associated Addendum (**Appendix 5.2**). The following text provides a summary of the findings of the appraisal.

Inner Study Area

- 5.3.2 An inner study area comprising the Site plus a 500m buffer has been used to gather information on designated and non-designated heritage assets in order to assess the potential for previously unknown archaeological remains to survive within the Site, and to identify any known archaeological assets within the Site which may be physically affected by the Proposed Development. The locations of the heritage assets within the Site and inner study area are shown on the plan of heritage assets within the inner study area included at **Figure 5.1a – 5.1h**. Numbers in bold and brackets in the text below refer to the assets as shown on the plan. **Figure 5.2** shows the locations of previous archaeological investigations (Archaeological Events) within the inner study area.

² Scottish Natural Heritage and Historic Environment Scotland (2018) Environmental Impact Assessment Handbook, Page 179

Outer Study Area

- 5.3.3 An outer study area comprising the Site plus a 2km buffer was used to gather information on heritage assets in order to identify those assets whose cultural significance may be affected due to changes within their setting. The locations of the heritage assets within the outer study area are shown on the plan of heritage assets within the outer study area included at **Figure 5.3a – 5.3e**.
- 5.3.4 The extent of the outer study area has taken into account:
- The location, type and scale of the Proposed Development;
 - The proximity of heritage assets to the Proposed Development;
 - The degree of inter-visibility between the heritage assets and the Proposed Development taking into consideration, for instance, changes in topography as well as interposing townscape features and seasonal changes; and
 - The cultural significance³ of the relevant heritage assets and the contribution made by their setting.
- 5.3.5 The extent of the study area was defined following Site visits carried out in April and May 2026, inspections of relevant assets and their setting by suitably qualified heritage professionals, and review of the bare earth and with screening ZTV models for the Proposed Development as prepared by Stephenson Halliday (**Figures 4.1 & 4.2**).

The Site

- 5.3.6 The Site consists predominantly of open land, the majority of which is agricultural and grazing in nature. The topography of the Site is generally level, with land rising gently towards the north. Historically the Carse of Gowrie area consisted of a series of isolated islands, known as inches, surrounded by less well drained land, and the name ‘inch’ meaning island is found in several local placenames, including Inchtute, Megginch, and a series of farms at Inchmichael. The land was extensively drained in the 18th and 19th centuries with a series of extensive ditches known locally as pows, creating the low-lying agricultural land seen today.
- 5.3.7 There is one designated heritage asset located within the Site. Land parcels H01 and H02 are located within the northern part of the Inventory Garden and Designed Landscape (GDL) of Megginch Castle.
- 5.3.8 The Perth and Kinross Historic Environment Record (HER) and National Record of the Historic Environment (NRHE) hold a record of eleven additional non-designated heritage assets located within the Site, as follows:

³ NPF4 defines cultural significance as: “aesthetic, historic, scientific or social value for past, present or future generations. Cultural significance can be embodied in a place itself, its fabric, setting, use, associations, meanings, records, related places and related objects”.

Prehistoric

- A ditched enclosure **(1)** has been identified on aerial photography to the east of West Inchmichael Farm, within Parcel E12. The single ditch, which encloses an area measuring about 50m by 36m, is, for the most part, curvilinear on plan, but has a straight side on the North. There has been no investigation of the enclosure, which is assumed to be of prehistoric date. The ditched enclosure forms part of a wider cluster of remains which extend outwith the Site.
- A ring ditch and a second possible ring ditch **(2)** have been identified on aerial photography within Parcel K03, and are tentatively dated to the Neolithic or Iron Age.
- The northeastern corner of a large area of features identified from cropmarks **(3)** intersects with the southeastern corner of Parcel J01. Inspection of the aerial photographs as held by NRHE, and the detailed description within the HER shows that the identified features of potential prehistoric date all lie within the area to the south, outwith the Site.

Medieval

- A large area of features identified from cropmarks on aerial photography **(3)** intersects with the southeastern corner of Parcel J01. Rig and furrow cultivation remains of medieval date can be seen within this area, and review of modern aerial photography shows that these extend beyond the area identified in the HER, across Parcel J01.
- An additional area of rig and furrow cultivation remains **(4)** has been identified further to the south within Parcel I02. Review of modern aerial photography has allowed the extent of this area of rig and furrow cultivation remains to be more clearly defined as shown on the Heritage Asset Plan contained at **Appendix 5.2**.

Post-Medieval

- Settlement at the 'island' of Megginch is thought to have originated as an early Christian monastery. The tower house, now much altered, which lies at the centre of the estate is first mentioned in a document of 1460. The tower and surrounding designed landscape were subject to substantial change during the Georgian period, and the 19th century gardens as seen today **(5)** are believed to overlie a much earlier monastic garden. Parcels H01 and H02 are located within the northwestern part of the estate, which is designated as an Inventory Garden and Designed Landscape (GDL).
- The southeasternmost portion of West Grange post medieval farmstead and engine house **(10)** extends just into the southwestern part of Parcel K03. Gourdiehill Orchard **(6)** is recorded as historically having covered the northwestern part of Parcel K11, modern aerial photography shows the area is now under agricultural cultivation.
- The remains of a pair of cottages **(7)** recorded on first and second edition OS mapping are recorded at the northern corner of Parcel E03. The location of these cottages is within an area of mature woodland shelterbelt.
- The HER record the location of a small square building **(8)** shown on the First Edition Ordnance Survey map within Parcel H02, which is believed to have been a well head associated with Kingdom Cottages and farmstead further to the east.

- A building **(9)** was formerly located within Parcel H01, it is known to have been removed by 1901 when it is no longer shown on the Ordnance Survey plan. No upstanding remains for the building are now visible.

20th Century

- A Sea Hawk aircraft is recorded to have crashed near, or to the south of Oldwood Farm, though the precise location of the crash site **(11)** is unknown. The HER identify an indicative area within which the aircraft crash may be located, which extends into the southern part of Parcel E06 and western most part of Parcel E07.

Miscellaneous Features

- The HER also records a single miscellaneous feature within the Site. A substantial piece of curvilinear tracery of likely 15th century date **(12)** was found within Parcel B03 in about 1970. It is considered likely to have originally come from Scone Abbey where other fragments of this type and period survive.

Inner Study Area

- 5.3.9 Full details of the previously recorded archaeology within the inner study area are set out in the Initial Cultural Heritage Appraisal and Addendum (**Appendix 5.1 and Appendix 5.2**). This baseline understanding of the known archaeology within the Site and inner study area was used to inform the assessment of the potential for the Site to contain previously unknown buried archaeological remains. This assessment is set out in detail in **Section 4** of the Initial Cultural Heritage Assessment and Addendum (**Appendix 5.1 and Appendix 5.2**), and summarised below.

Assessment of Archaeological Potential of the Site

- 5.3.10 The Site comprises approximately 62 parcels of agricultural and grazing land within the Carse of Gowrie. The Carse is known to have historically comprised a large area of marshy land within which there were a series of islands known as inches. The land was drained in the 18th and 19th centuries with extensive ditches known locally as pows, which create the low-lying agricultural land as seen today.
- 5.3.11 This understanding of the historic landscape indicates that there is a higher potential for archaeological remains predating the 18th century to be found at the localised high points in the topography which were formerly islands amidst the surrounding marshland.
- 5.3.12 The potential for the discovery of previously unknown archaeological remains of prehistoric date has been identified in the following areas:
- Land parcel K03, to the north of North Grange, where two ring ditches have been identified on aerial photography has a high potential for the discovery of prehistoric remains.
 - Within the area of West Inchmichael / South Inchmichael where a cluster of features of likely prehistoric date have been identified from aerial photographs. Land parcels E11, E12, and J01 are considered to have the highest potential. A ring ditch **(1)** has been identified partially within parcel E12, and forms part of a wider area of cropmarks which partly lie within Potential Additional Option for Habitat Mitigation and Underground Cable

Route, marked on **Figure 2.2** as Mitigation 1. There is considered to be a high potential for the discovery of prehistoric remains within these two areas.

- A cluster of archaeological remains occupy the rising land close to Rait and Fingask. Although clustered on the rising land, the find of a cist burial of likely Bronze Age date further downslope below Flawcraig Farm suggests the possibility that prehistoric activity extended further onto the lower ground. The western parts of parcels F07, F06, and D01 are therefore considered to have a moderate potential for the discovery of previously unknown buried archaeological remains of prehistoric date.

5.3.13 The assessment concluded that there is an overall low potential for the discovery of previously unknown archaeological remains of medieval and post-medieval date within the Site.

5.3.14 A Sea Hawk aircraft (**11**) is recorded to have crashed near, or to the south of Oldwood Farm (Parcels E06 & E07). The precise location of the aircraft crash site is unknown, but there is considered to be some potential for the discovery of archaeological remains of the crash site to be found within this localised area.

5.3.15 Elsewhere across the Site, there is considered to be a negligible potential for the discovery of previously unknown archaeological remains of 20th century date.

Outer Study Area

5.3.16 There are large number of designated heritage assets within the outer study area. These comprise:

- 4 Conservation areas;
- 25 Scheduled monuments;
- 161 Listed buildings comprising 12 Category A listed buildings, 76 Category B listed buildings and 73 Category C listed buildings; and
- 5 Inventory Gardens and Designed Landscapes.

5.3.17 There are a number of other non-designated heritage assets located within the outer study area. No non-designated heritage assets with the potential for their cultural significance to be affected by change within their setting have been identified, and these are not considered further in this EIASR.

Potential Sources of Impact

5.3.18 The EIA Handbook (SNH and HES 2018) identifies a number of ways in which heritage assets may be affected by development, these can be summarised as:

- **Direct Physical Impacts** – where the physical fabric of the asset is affected as a result of the Proposed Development. (*Direct Physical Impacts occur during the demolition or construction phases, and will usually be permanent*).

- **Indirect Physical Impacts** – where the physical fabric of the asset is affected as a result of the Proposed Development, although the asset is situated at a distance from the Proposed Development⁴.
- **Setting Impacts** – impacts resulting from change within the setting of a heritage asset which affects its cultural significance due to changes in how it is understood, appreciated or experienced. (*Setting Impacts may occur during construction or operational phases, they may be either temporary or permanent*).
- **Cumulative Impacts** – arising due to the interactions of the impacts arising from the Proposed Development in-combination with other projects⁵.

Design Considerations

- 5.3.19 An understanding of the known archaeological remains within the Site, and the potential for the discovery of previously unknown buried archaeological remains to be found within the Site has been developed within the Initial Cultural Heritage Appraisal. The Proposed Development will seek to avoid direct and indirect physical impacts upon known buried archaeological deposits wherever possible.
- 5.3.20 There are a number of designated heritage assets located within the Outer Study Area whose cultural significance has the potential to be affected by changes within their setting. Design development will be informed by an understanding of the cultural significance and setting of these heritage assets in order to avoid and minimise these effects.

5.4 Consultation

- 5.4.1 A historic environment record (HER) data extract for the Site and inner study area was requested from Perth and Kinross Heritage Trust (PKHT) and received on 25th March 2026.
- 5.4.2 Areas of the Megginch Castle Inventory Garden and Designed Landscape (GDL) are currently included within the Site and are being considered as potential locations for PV panels or habitat mitigation measures. Correspondence with Historic Environment Scotland in relation to the Megginch Castle GDL is ongoing, with an onsite meeting scheduled in July. The understanding gained through this correspondence will inform iterative design development. The outcome of this consultation and the design rationale for the final Proposed Development will be detailed in the Environmental Impact Assessment Report (EIAR) and Design and Access Statement.
- 5.4.3 Further consultation with Historic Environment Scotland and Perth and Kinross Heritage Trust will be ongoing during the design development and EIA process.

⁴ Examples of indirect physical impacts include – damage to walls arising from vibration resulting from piling nearby to the heritage asset, or degradation of waterlogged archaeological deposits due to changes in drainage patterns.

⁵ Scottish Natural Heritage and Historic Environment Scotland (2018) Environmental Impact Assessment Handbook, page 182

5.5 Survey and Assessment Methodology

Surveys

Desk-based Survey

- 5.5.1 Up-to-date information on the locations of heritage assets (both designated and non-designated) within and in the vicinity of the Site was obtained from the following sources:
- Details of all statutory designated heritage assets, including Scheduled Monuments and Listed Buildings were collected from the Historic Environment Scotland Designations Map Search⁶;
 - The National Record of the Historic Environment (Canmore) database⁷ and Historic Environment Record (HER) provided further detail on the character and condition of known heritage assets;
 - Historic maps held by the Map Library of the National Library of Scotland provided information on the development of the area, and information regarding particular heritage assets;
 - Online aerial photography (Google Earth) provided further detail on the character of some heritage assets; and
 - Lidar data was obtained from the Scottish Remote Sensing Portal⁸.

Field Visits

- 5.5.2 Site visits were carried out in April and May 2026 to establish the current condition of the Site, identify heritage features, and to visit proximate heritage assets and consider their baseline setting. The weather conditions were fair with good visibility during site visits.

Assessment Methodology

- 5.5.3 There is no all-encompassing Scottish or UK guidance relating to the assessment of impacts on built heritage⁹. The methodology for establishing the relative value and sensitivity to change of heritage assets, the magnitude of impact and the level and significance of effect

⁶ Historic Environment Scotland (HES) Designations Map Search <http://historicscotland.maps.arcgis.com/apps/Viewer/index.html?appid=18d2608ac1284066ba3927312710d16d>

⁷ National Historic Environment Record (NHE) available online at: <https://www.trove.scot/>

⁸ Scottish Government (2026) Scottish Remote Sensing Portal. Available online at: <https://remotesensingdata.gov.scot/data/#/map>

⁹ Scottish Natural Heritage and Historic Environment Scotland (2018) Environmental Impact Assessment Handbook, Page 176

have been drawn from the EIA Handbook¹⁰, the DMRB¹¹ and Principles of Cultural Heritage Impact Assessment in the UK¹².

Sensitivity

- 5.5.4 The sensitivity to change / value of affected receptors has been considered on a scale of very high, high, medium, low or negligible. It is a scaled measure of the degree to which the cultural significance of that heritage asset should be protected¹³.
- 5.5.5 Judgements on the sensitivity of the receptors (heritage assets) will be informed by **Table 5.3** below, prepared with reference to the example methodologies set out in the EIA Handbook and in Table 3.2N of the DMRB, and a clear understanding of the cultural significance of each of the assets including any contribution made by their setting. This baseline understanding has been set out in the Initial Cultural Heritage Appraisal and been informed by documented evidence, site visits, and professional opinion and judgement. This baseline understanding will be supplemented as necessary during the EIA process. The judgements on the relative sensitivity of the receptors has also been informed by the criteria for designation as set out in HES Guidance¹⁴.
- 5.5.6 The five point scale for the assessment of the sensitivity of heritage receptors as set out in the DMRB has been adopted as it provides a greater level of detail of the relative sensitivity to change of the assets and better supports complex impact assessment and decision-making.

Table 5.3: Determining the Sensitivity of the Receptor

Sensitivity to change/ value	DMRB Definition	Application of Definition to Built Heritage
Very High	Very high importance and rarity, international scale and very limited potential for substitution	- Sites inscribed as of universal importance as World Heritage Sites - Other buildings or assets of recognised international importance
High	High importance and rarity, national scale, and limited potential for substitution	- Scheduled monuments - Inventory Historic Battlefields - Category A Listed Buildings - Other listed buildings that can be shown to have exceptional qualities in their fabric or historical association not adequately reflected in the listing grade

¹⁰ Scottish Natural Heritage and Historic Environment Scotland (2018) Environmental Impact Assessment Handbook

¹¹ National Highways (2020) Design Manual for Roads and Bridges (DMRB), LA 104: Environmental Assessment and Monitoring. London: Highways England.

¹² IHBC, CIfA and IEMA (2021) Principles of Cultural Heritage Impact Assessment. London: IHBC/CIfA/IEMA.

¹³ IHBC, CIfA and IEMA (2021) Principles of Cultural Heritage Impact Assessment. London: IHBC/CIfA/IEMA. Para 1.8

¹⁴ Historic Environment Scotland (2019) Designation Policy and Selection Guidance.

Sensitivity to change/ value	DMRB Definition	Application of Definition to Built Heritage
		- Inventory Gardens and Designed Landscapes - Conservation areas containing very important buildings
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution	- Category B Listed Buildings - Historic (unlisted) buildings that can be shown to have considerable qualities in their fabric or historical association - Conservation areas containing important buildings - Historic townscape or built-up areas with historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Low	Low or medium importance and rarity, local scale.	- Category C Listed Buildings - Historic (unlisted) buildings of modest quality in their fabric or historical association - Historic townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Negligible	Very low importance and rarity, local scale.	Assets of no architectural or historic note; buildings of an intrusive character

Determining the Magnitude of Change

5.5.7 The magnitude of change, that is the change experienced from the current baseline conditions by the sensitive receptor, will be considered on a scale of large, medium, small or negligible.

5.5.8 The magnitude of change to heritage assets will be assessed as outlined in the criteria in **Table 5.4** which draws upon Appendix 1, Figure 1 of the EIA Handbook and Table 3.4N of the DMRB, applying this to the assessment of impacts on heritage assets¹⁵.

Table 5.4: The Magnitude of Change to Heritage Assets

Magnitude of Change (DMRB terminology /EIA Handbook terminology)	DMRB Definition	Application of Definition to Built Heritage
Major/ Substantial	Adverse	Adverse

¹⁵ National Highways (2020) Design Manual for Roads and Bridges (DMRB), LA 104: Environmental Assessment and Monitoring. London: Highways England.

Magnitude of Change (DMRB terminology /EIA Handbook terminology)	DMRB Definition	Application of Definition to Built Heritage
	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. Beneficial Large scale or major improvement of resource quality; extensive restoration	Change to key elements of the fabric or setting of a heritage asset resulting in considerable, complete or near complete loss of its cultural significance. Beneficial Change to key elements of the fabric or setting of a heritage asset resulting in considerable enhancement of the cultural significance of the asset.
Moderate/ Moderate	Adverse Loss of resource but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.	Adverse Change to key elements of the heritage asset, such that the asset is clearly modified and there is some loss of cultural significance. Change within the setting of a heritage asset leading to some loss of cultural significance Beneficial Change to key elements of the heritage asset, such that the asset is clearly modified and there is some enhancement of cultural significance. Change within the setting of a heritage asset leading to some enhancement.
Minor/ Slight	Adverse Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of adverse impact occurring.	Adverse Changes to elements of the heritage asset or its setting, such that the asset is slightly altered and there is some loss of cultural significance. Beneficial Changes to elements of the heritage asset or its setting, such that the asset is slightly altered and there is some slight enhancement of cultural significance.
Negligible/ Negligible	Adverse Very minor loss or detrimental alteration to one or more characteristics, features or elements. Beneficial Very minor benefit to or beneficial addition of one or more	Adverse Very minor changes to the fabric or setting of a heritage asset that hardly affect the cultural significance of the asset. Beneficial Very minor changes to the fabric or setting of a heritage asset that

Magnitude of Change (DMRB terminology /EIA Handbook terminology)	DMRB Definition	Application of Definition to Built Heritage
	characteristics, features or elements.	hardly affect the cultural significance of the asset.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.	No change to the fabric or setting of a heritage asset such that its cultural significance is unchanged.

Determining the Level of Effect

- 5.5.9 The level attributed to each effect will be assessed based on the magnitude of change due to the Proposed Development and the evaluation of the sensitivity to change / value of the affected receptor. The level of effect will be determined using professional judgement and **Table 5.5** will be used as a tool to assist with this process and is informed by the Significance Matrix at Table 3.8.1 in the DMRB.¹⁶

Table 5.5: Matrix to Support Determining the Level of Effect

Magnitude of change/impact	Sensitivity to Change/Value					
		Very High	High	Medium	Low	Negligible
	Major/ Substantial	Very large	Large or very large	Moderate or large	Slight or Moderate	Slight
	Moderate/ Moderate	Large or very large	Moderate or large	Moderate	Slight	Neutral or slight
	Minor/ Slight	Moderate or large	Slight or moderate	Slight	Neutral or slight	Neutral or slight
	Negligible/ Negligible	Slight	Slight	Neutral or slight	Neutral or slight	Neutral

- 5.5.10 The terminology used (very large, large, moderate, slight, neutral) is not the terminology used within the EIA handbook. The terminology has been taken from and is defined in DMRB and therefore these terms are considered to be a suitable alternative. The five-point scales for identifying the sensitivity to change of receptors, and the conclusions on level of effect upon receptors provides a greater level of detail and supports complex impact assessment and decision-making.
- 5.5.11 Whilst the matrix provides ranges, the level of effect will be confirmed as a single level and not a range, informed by professional judgement. A statement will also be made as to

¹⁶ National Highways (2020) Design Manual for Roads and Bridges (DMRB), LA 104: Environmental Assessment and Monitoring. London: Highways England.

whether the level of effect is ‘Significant’ or ‘Not Significant,’ again based on professional judgement.

- 5.5.12 The level of effect to heritage assets will be quantified based upon the cultural significance of the asset, the contribution made by its setting, and the nature and level of the effect of the Proposed Development on that cultural significance. A detailed discussion will be set out within the Cultural Heritage Statement which will be appended to the EIAR.
- 5.5.13 The following terms, defined in **Table 5.6** will be used to determine the significance of the effects identified and these can be ‘beneficial’ or ‘adverse.’

Table 5.6: The Level of Effect on Heritage Assets

Level of effect	DMRB Definition
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Significance of Effect

- 5.5.14 For each residual effect, a statement will be made as to whether the level of effect is ‘Significant’ or ‘Not Significant’. This determination will be based on professional judgement and/or relevant guidance/legislation where applicable.
- 5.5.15 Significance will only be concluded for residual effects (for example, following the identification of secondary additional mitigation).

Visualisations

- 5.5.16 The assessment will be supported by a series of photomontages and wireline visualisations for viewpoint locations which will be agreed in consultation with HES and PKHT. Visualisations from each viewpoint will be prepared in accordance with the Landscape Institute Visual Representation of Development Proposals Technical Guidance Note 06/19.

Cumulative Assessment

- 5.5.17 The cumulative assessment will consider effects arising from the interaction of the Proposed Development in-combination with other projects within the outer study area.

5.6 Potential Significant Effects

5.6.1 The following potential significant effects have been identified based upon the initial understanding of the Site, surrounding inner and outer study areas and details of the emerging development proposals. Although there is no all-encompassing Scottish or UK guidance relating to the assessment of impacts on cultural heritage for EIA, the Design Manual for Roads and Bridges advises that the effect on the cultural heritage resource is not significant when the impact does not substantially diminish the heritage interest [cultural significance] of the cultural heritage resource¹⁷.

Table 5.7: Potential Significant Effects

Effect	Receptor	Applicable stage(s)
Loss or disturbance of known archaeological remains	Full details of known archaeological remains are set out in the Initial Cultural Heritage Assessment Appendix 5.1 and Addendum Appendix 5.2 .	construction / operation
Loss or disturbance to potential or previously unknown buried archaeological remains	The assessment of the potential for the survival of previously unknown archaeological remains is set out in the Initial Cultural Heritage Assessment and Addendum (Appendix 5.1 and Appendix 5.2)	construction / operation
Effects upon the cultural significance of heritage assets as a result of change within their setting	- Rait Old Parish Church (Scheduled Monument SM5613) (HAP Ref. 1) - West-Town Church, 230m NNW of Westown (Scheduled Monument SM5614) (HAP Ref. 5) - Evelick, fort WSE of (Scheduled Monument SM3095) (HAP Ref. 174) - Rait Conservation Area - Inchmartine House (Category A listed building LB13773) (HAP Ref. 21) - Fingask Castle (Category B Listed Building LB11634) (HAP Ref. 46) - Flatfield Farmhouse and Garden Walls (Category B listed building LB10959) (HAP Ref. 26)	construction / operation

¹⁷ Highways England (2020) The 'Design Manual for Roads and Bridges' ((LA 104 Environmental Assessment and Monitoring) and (LA 106 Cultural Heritage Assessment))

Effect	Receptor	Applicable stage(s)
	- Flatfield Steading (Category B listed building LB10960) (HAP Ref. 27) - East Inchmichael Farmhouse and Former Chapel (Category B listed building LB48154) (HAP Ref. 68) - Megginch Castle Inventory Garden and Designed Landscape (GDL00278) - Fingask Castle Inventory Garden and Designed Landscape (GDL00179)	

5.7 Approach to Mitigation

5.7.1 Consideration for the potential for impacts upon heritage assets and assessment of impacts will be ongoing during the design iteration process. The approach to mitigation will be in accordance with policy HEP4 of the Historic Environment Policy for Scotland and Policy 7 of NPF4. The following broad principles will be applied:

- The Proposed Development will seek to avoid direct and indirect physical impacts upon known buried archaeological deposits within the Site wherever possible.
- Consultation with PKHT will be carried out to discuss the findings of the Initial Cultural Heritage Appraisal and to explore whether any additional investigation of the Site to identify areas of archaeological potential / sensitivity is required (for example through geophysical survey).
- If there are areas where impacts upon buried archaeological deposits cannot be avoided, a scheme of additional mitigation measures will be agreed with PKHT. Measures may include excavation, recording, analysis, archiving, publication and other activities to provide public benefit.
- Opportunities to minimise and mitigate effects upon the cultural significance of heritage assets within the outer study area, due to change within their setting, will be sought during the design process. Examples of mitigation measures which will be applied include relocation or micro-siting of elements of the Proposed Development, and detailed landscaping design.
- A series of viewpoint locations for visualisations to inform assessment of impacts upon the setting of heritage assets and to inform design development will be agreed with HES and PKHT.

5.8 Matters Scoped Out

5.8.1 Heritage assets can be affected by a broad range of factors causing change, these may be physical changes to them or changes to their setting. The range of effects in relation to

cultural heritage assets, and at which point they may be significant, does not fit the strict outcome of the binary assessment. Whether an effect is significant or not significant is a matter of professional judgement.

- 5.8.2 The DMRB LA 106¹⁸ states that the effect on the cultural heritage resource is not significant when the impact does not substantially diminish or enhance the heritage interest of the cultural heritage resource.
- 5.8.3 The following effects are considered unlikely to be significant and will therefore not be considered further within the EIAR and hence are **scoped out**:
- Direct effects upon scheduled monuments, listed buildings and conservation areas;
 - Changes in the setting of designated heritage assets over 2km from the Site (with the exception of Evelick fort SM3095);
 - Changes in the setting of non-designated heritage assets; and
 - Changes in the setting of designated heritage assets within the outer study area other than those identified in **Section 5.6** as potentially being significantly affected.
- 5.8.4 Cultural heritage assets which are likely to be affected by the Proposed Development but unlikely to experience significant effects will be assessed in a Cultural Heritage Assessment that will be appended to the EIAR and will be prepared in light of the statutory duties of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act, relevant policies of the National Planning Framework 4 (NPF4) and other relevant guidance in relation to cultural heritage.

5.9 Questions to Consultees

- 5.9.1 Can you confirm that you consider the inner study area to be appropriate to inform the assessment of the archaeological potential of the Site?
- 5.9.2 Can you confirm your agreement of the assessment of the areas of archaeological potential, or identify additional investigation which you consider necessary to further understand the archaeological potential?
- 5.9.3 Can you confirm your acceptance of the proposed assessment methodology?
- 5.9.4 Can you confirm your agreement of the list of heritage assets which may be significantly affected as a result of change within their setting (as set out in **Table 5.7?**)
- 5.9.5 Can you confirm that you agree that the following effects are unlikely to be significant and do not therefore need to be considered further within the EIAR?
- Direct effects upon scheduled monuments, listed buildings and conservation areas;

18 Highways England (2020) The 'Design Manual for Roads and Bridges' (LA 104 Environmental Assessment and Monitoring) and (LA 106 Cultural Heritage Assessment) ('DMRB')

- Changes in the setting of designated heritage assets over 2km from the Site (with the exception of Evelick fort SM3095);
- Changes in the setting of non-designated heritage assets; and
- Changes in the setting of designated heritage assets within the inner study area other than those identified in **Section 5.6** as potentially being significantly affected.

5.10 References and Guidance

- UK Parliament (1997) The Planning (Listed Buildings and Conservation Areas) (Scotland) Act.
- UK Parliament (1979) Ancient Monuments and Archaeological Areas Act.
- The Scottish Government (2025) National Planning Framework 4.
- The Scottish Government (2019) Historic Environment Policy Scotland.
- Perth and Kinross Council (2019) Perth and Kinross Local Development Plan 2.
- Scottish Natural Heritage and Historic Environment Scotland (2018) Environmental Impact Assessment Handbook. Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland.
- Historic Environment Scotland (2019) Managing Change in the Historic Environment: Setting.
- Historic Environment Scotland (2016) Managing Change in the Historic Environment: Gardens and Designed Landscapes.
- Institute of Historic Building Conservation, Chartered Institute for Archaeologists & Institute of Environmental Management and Assessment (2021) Principles of Cultural Heritage Impact Assessment.
- Scottish Renewables (September 2025) Guidelines on Streamlining Environmental Impact Assessment for Onshore Windfarms.
- Standards for Highways (Jan 2020) Design Manual for Roads and Bridges (DMRB), LA 104 Environmental assessment and monitoring and LA 106 - Cultural Heritage Assessment.
- Landscape Institute (September 2019) Visual Representation of Development Proposals, Technical Guidance Note 06/19.
- Chartered Institute for Archaeologists (2017) Standard and guidance for historic environment desk-based assessment.
- Historic Environment Scotland (2019) Designation Policy and Selection Guidance.

6 ECOLOGY

6.1 Introduction

- 6.1.1 This chapter provides consideration of the potential significant effects of the Proposed Development on the environment with respect to ecology. It provides a summary of baseline ecological information collected to date, and the further baseline data that will be collected to inform the assessment of the impacts and likely significance of associated effects of the Proposed Development.
- 6.1.2 An overview of ecological features determined as likely to represent 'Important Ecological Features' (IEFs), and subsequently to require consideration within the Environmental Impact Assessment Report (EIAR), is provided. A description of the approach to Ecological Impact Assessment (EclA) and proposed assessment methodology is also provided for consultees consideration and comment.

Study Area and Zone of Influence

- 6.1.3 The ecological study areas for the Proposed Development have been based on 'zones of influence' for different ecological features which may be affected by biophysical changes as a result of the Proposed Development. The zones of influence that extend beyond the direct land-take required for the Proposed Development have been identified based upon the nature of the Proposed Development and the construction, operation and decommissioning activities to be undertaken. The zone of influence will therefore vary for different ecological features depending on their sensitivity to an environmental change. The identified zones of influence have been used to establish the scope of baseline ecological surveys and the extent of study areas and desk study.
- 6.1.4 Study areas are defined in the context of the boundary of the Site and comprise:
- Statutory designated sites – searches made for information on statutory designated sites (internationally and nationally important sites for ecology) within 10km for Special Areas of Conservation (SACs) and 5km for Sites of Special Scientific Interest (SSSI);
 - Non-statutory designated sites – searches will be made of these sites within 2km of the Site;
 - Ancient woodland – searches will be made of habitats on the ancient woodland inventory (AWI) within 50m of the Site;
 - Habitats - land within the Site and immediately surrounding habitats where these could be surveyed from within the Site;
 - Protected mammals – the frozen layout for the Proposed Development and out to 200m (for otter) as per NatureScot guidance (2024); and
 - Great crested newts – ponds/waterbodies within 500m of the Site.

6.2 Legislation Policy and Guidance

Legislation

6.2.1 Reference will be given to the following key pieces of legislation:

- Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971¹⁹ (hereafter referred to as the 'Ramsar Convention');
- Convention on the Conservation of European Wildlife and Natural Habitats 1972²⁰ (hereafter referred to as the 'Bern Convention');
- UNESCO convention on the protection of the World Cultural and Natural Heritage²¹ (1972);
- Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora²²);
- The Invasive Alien Species (Enforcement and Permitting) Order 2019²³;
- The Wildlife and Countryside Act 1981 (as amended in Scotland²⁴);
- The Wildlife and Natural Environment (Scotland) Act 2011²⁵;
- The Nature Conservation (Scotland) Act 2004²⁶;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) in Scotland via the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019²⁷ (The Habitats Regulations);

¹⁹ www.whc.unesco.org/en/conventiontext/ (Accessed 07/05/2026)
www.unesco.org.uk/site/assets/files/14166/convention_on_wetlands_of_international_importance_especially_as_waterfowl_habitat_1971.pdf (Accessed 07/05/2026)

²⁰ www.coe.int/en/web/bern-convention (Accessed 07/05/2026)

²¹ www.whc.unesco.org/en/conventiontext/ (Accessed 07/05/2026)

²² www.eur-lex.europa.eu/eli/dir/1992/43/oj/eng (Accessed 07/05/2026)

²³ www.legislation.gov.uk/uksi/2019/527 (Accessed 07/05/2026)

²⁴ www.legislation.gov.uk/ukpga/1981/69/part/II/scotland (Accessed 07/05/2026)

²⁵ www.legislation.gov.uk/asp/2011/6/contents (Accessed 07/05/2026)

²⁶ www.legislation.gov.uk/asp/2004/6/contents (Accessed 07/05/2026)

²⁷ www.legislation.gov.uk/uksi/1994/2716/contents (Accessed 07/05/2026)

- The Electricity Act 1989 (Schedule 9²⁸);
- The Protection of Badgers Act 1992²⁹; and
- The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003³⁰.

Policy

6.2.2 Reference will be given to the following key pieces of policy:

- Scottish Government (2023) National Planning Framework 4 (NPF4);
- Scottish Government (2024) The Scottish Biodiversity Strategy to 2045;
- Scottish Government (2008) Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008;
- NatureScot (2025a) The Scottish Biodiversity List (SBL);
- Perth and Kinross Local Development Plan 2 (PKLDP2)(2019); and
- Tayside Local Biodiversity Action (2016).

Guidance

6.2.3 Reference will be given to the following (non-exhaustive) key pieces of guidance:

- Chartered Institute of Ecology and Environmental Management (CIEEM)(2018, revised in 2024) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine;
- Scottish Environmental Protection Agency (SEPA) (2014) Land use planning system SEPA guidance Note 31;
- SEPA (2017) Guidance on Assessing the Impacts of Groundwater Abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTEs);
- SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems;
- Joint Nature Conservation Committee (JNCC)(2010) Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. JNCC, Peterborough;

²⁸ www.legislation.gov.uk/ukpga/1989/29/schedule/9 (Accessed 07/05/2026)

²⁹ www.legislation.gov.uk/ukpga/1992/51/contents (Accessed 07/05/2026)

³⁰ www.legislation.gov.uk/asp/2003/15/contents (Accessed 07/05/2026)

- Collins, J. (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition;
- NatureScot (2023) Developing with Nature guidance;
- NatureScot (2026) Planning and development: enhancing biodiversity;
- NatureScot (2025b) NatureScot pre-application guidance for solar farms; and
- NatureScot (2024) Planning and development: Protected Species.

6.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 6.3.1 The Proposed Development Site, as shown in **Figure 2.2**, is an area of predominantly lowland agricultural and grazing land approximately 11km east of Perth and 9km southwest of Dundee, broadly between the settlements of Inchtute, Errol and Rait. It is bisected by the A90 trunk road and railway running between Perth and Dundee; and parallel 275kV and 132kV overhead transmission lines between Dundee and Abernethy substation.
- 6.3.2 The study area is flat and is predominantly used for arable farming; during surveys in 2025 this principally comprised wheat and oil-seed rape. There are also some areas of sheep-grazed improved grassland. There are several scattered small pockets of planted broad-leaved or mixed woodland, and numerous hedgerows, lines of (and scattered) mature trees, watercourses, pows³¹ and ditches, which form the boundaries to the farmed fields. The Site overall is relatively open in nature, and accordingly, across most of the Site, habitats with potential ecological value are restricted to the field boundaries and wooded areas.
- 6.3.3 The habitat survey carried out identified some stone bridges and mature trees within the Site as being potentially suitable for supporting roosting bats. Evidence of beaver activity (gnawing on a tree trunk) was recorded along the Grange Pow ditch which flows through the western part of the Site (north of the A90). No other evidence of protected species was recorded. Invasive non-native (INN) Japanese knotweed was recorded along the Grange Pow ditch, and INN Himalayan balsam was scattered along some ditches on-site.

Potential Additional Options and Indicative Underground Cable Route Corridors

- 6.3.4 Potential Additional Options for both PV and mitigation areas and Indicative Underground Cable Route Corridors are illustrated on **Figure 2.2**. These include Potential Additional Options for PV and Habitat Mitigation, namely Solar Area 1 and 2, and Mitigation Area 1 and 2; all additional areas are located northwest of Errol Airfield.
- 6.3.5 These areas will be included as part of the Study Area for surveys in 2026 to determine the ecological baseline to inform the assessment. Principal surveys will be extended habitat surveys, with any detailed protected mammal surveys undertaken as required once the Proposed Development layout is determined. Due to the short-term temporary nature of

³¹ Pows are Middle Age man-made drains developed to improve the drainage of surrounding soils.

impacts of the works, it is not intended to carry out specific baseline surveys of the Indicative Underground Cable Route Corridors, as it is considered that any impacts arising from this work in respect of ecological features will be readily mitigated by embedded and standard good practice mitigation. The proposed approach to surveys and assessment discussed herein is unchanged by the inclusion of these additional areas.

Potential Sources of Impact

- 6.3.6 The assessment will consider the potentially significant effects associated with the construction, operation and decommissioning phases of the Proposed Development.

Construction

- 6.3.7 Potential construction phase ecological effects associated with the Proposed Development are considered to relate to:
- Direct land take (habitat loss) to accommodate the Proposed Development;
 - Potential habitat degradation through indirect impacts to habitats and species through pollution including to nearby watercourses (for example, dust deposition, runoff, lighting);
 - Temporary disturbance, displacement, fragmentation and land take for laydown areas and construction compounds; Disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within and adjacent to the Site; and
 - Spread of INNs.

Operation

- 6.3.8 Operation phase effects are defined as effects following the construction of the Proposed Development. Operation phase effects generally relate to disturbance of habitats or species, on either a temporary or permanent basis. Some effects may reduce with habituation or remain for the lifetime of the Proposed Development.
- 6.3.9 Typical human disturbance from operation of the Proposed Development is not anticipated to be any greater than current levels of agricultural and recreational activity, although any replacement of solar PV modules and batteries during operation would result in greater disturbance (akin to that during the construction and decommissioning phase, though acting over a considerably more localised area).
- 6.3.10 There are no additional operational effects relating to land take or habitat loss other than those already addressed for the construction phase.

Decommissioning

- 6.3.11 Decommissioning effects are defined as effects following the end of the operation phase of the Proposed Development. Decommissioning effects relate to disturbance of habitats or species, on a temporary basis and disturbance and pollution (indirect effects such as noise and vibration, dust, pollution from surface water run-off) resulting from Site decommissioning activities, plant and vehicles movements. It is likely that the effects of the decommissioning will be broadly similar to those identified for the construction phase, and so are considered to

be mitigable via a comparable suite of standard mitigation and good practice measures, to be secured for the decommissioning phase by condition.

- 6.3.12 Any habitat implementation/enhancement proposed will also be considered as part of the assessment.

Design Considerations

Mitigation by Design

- 6.3.13 The following measures will be considered as standard mitigation and incorporated into the design of the Proposed Development to avoid and protect IEFs, insofar as is achievable:
- Up to a 50m buffer will be applied between the Proposed Development and ancient woodland (listed on the AWI), with up to 30m between the Proposed Development and other woodland;
 - A minimum 10m buffer will be applied between the Proposed Development and the Firth of Tay and Eden Estuary SAC and the Inner Tay Estuary SSSI (noting that the SAC/SSSI has much greater spatial separation from the Site; see **Table 6.1**);
 - A minimum 30m buffer will be applied between the Proposed Development and watercourses, including the River Tay SAC (noting that the SAC has much greater spatial separation from the Site; see **Table 6.1**);
 - A minimum buffer of 10m will be applied between the Proposed Development and hedgerows, pows, ditches and identified preliminary (bat) roost features (PRFs);
 - A minimum buffer of 50m will be applied between the Proposed Development and ponds (unless great crested newts are confirmed as absent, where this buffer would be 30m) and any identified beaver lodge;
 - Further species-specific buffer zones will be implemented in the event that key features are identified during field surveys (for example, a badger sett), and further detailed information will be provided within the EIAR;
 - Design will be sensitive to ecologically valuable habitats, and these will be avoided so far as practicable with impacts on field boundary vegetation largely to be avoided with only some localised, small-scale removal of boundary vegetation for access where/if required;
 - There will be no permanent new lighting of boundary features (hedgerows, watercourses and ditches);
 - There will be mammal gates installed on any perimeter fences, particularly if there is evidence that species such as badger are active within, and passing through, the Site; and
 - The requirement for any new watercourse / ditch crossings will be minimised, and they will be sensitively designed to allow the continued movement of water and aquatic wildlife along the watercourses.

Standard Good Practice Measures

- 6.3.14 The EIAR will include as a minimum:
- An Outline Construction Environmental Management Plan (oCEMP); and
 - An Outline Landscape and Ecological Management Plan (oLEMP); or equivalent biodiversity/habitat enhancement plan.
- 6.3.15 The oCEMP will describe measures to be implemented during the construction process and would include commitments to Species Protection Plans (SPPs), Reasonable Avoidance Measures (RAMs), pre-construction surveys and appropriate derogation licenses (as required) as well as pollution (including dust) prevention and sediment run-off control, managed construction lighting and noise / traffic management measures.
- 6.3.16 The oLEMP (or equivalent) would include measures designed to ensure delivery of the Proposed Development's habitat enhancement strategy, and in accordance with NPF4 and corresponding local policy.
- 6.3.17 In the event that impacts cannot be avoided, appropriate additional mitigation measures would be implemented, and this would be detailed in the EIAR.

Enhancement

- 6.3.18 Through habitat enhancement measures that would be adopted and detailed within the oLEMP (or equivalent), the Proposed Development would deliver clear benefits for a broad range of key ecological features/species. Such measures to be considered would include the creation of species-rich wildflower strips, improving hedgerows through the planting of tree/scrub species of local provenance to fill in gaps in field boundary features and increase species richness, hedgerow and tree planting, the provision of wildlife boxes (such as bat roosting boxes, bird boxes and invertebrate shelters [log piles and 'bug hotels']) and INNs control (given the presence of Japanese knotweed and Himalayan balsam on-site). Consultation with local environmental enterprise groups would be undertaken to discuss locally important enhancement opportunities that could be implemented on-site (this could include seeking input from invertebrate conservation groups).
- 6.3.19 The EIAR will therefore include consideration of the potential benefits of the Proposed Development with respect to the enhancement measures that would be implemented.

6.4 Consultation

- 6.4.1 No consultation has yet been undertaken for ecology. It is understood that there is no active local environmental records centre (LERC) covering the Site and surrounds. However, the Tayside Biodiversity Partnership will be approached for any relevant ecological records (within 2km of the Site) given the partnership has a number of working and interest groups, so there may be relevant ecological information available for purchase. This will be extended to request details of any non-statutory sites within 2km of the Site.
- 6.4.2 The Tay District Salmon Fishery Board and the Tay Foundation will be approached for any fish data that they may have relevant to the Site.

6.5 Survey and Assessment Methodology

Desk Study

- 6.5.1 A review of NatureScot's Sitelink website³² for statutory designated sites relevant to the Site has been undertaken. The NatureScot's Maps website³³ has also been reviewed for AWI habitat within, and out to 50m from, the Site. Further desk study comprising consultation with consultees listed in **Section 6.4**, and others as appropriate, will also be undertaken.
- 6.5.2 At this stage, those internationally statutory designated sites (with qualifying ecological interests) within 10km of the Site (and 5km for nationally statutory designated sites) have been identified and are shown in **Figure 6.1** and summarised in **Table 6.1**.

Table 6.1: Statutory Designated Sites for Nature Conservation with Ecological Interests

Site Name	Approximate Distance and Direction from Site (km)	Qualifying Interests
Firth of Tay and Eden Estuary SAC	0km (adjacent), south	Estuaries; Intertidal mudflats and sandflats; Common seal; and Subtidal sandbanks.
Inner Tay Estuary SSSI	0km (adjacent), south	Coastlands: Saltmarsh; and Fens: Transition saltmarsh.
River Tay SAC	6.2km, southwest	River lamprey; Brook lamprey; Otter; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; Sea lamprey; and Atlantic salmon.
Flisk Wood SSSI	4.2km southeast	Broad-leaved, mixed and yew woodland; Upland mixed ash woodland.

Surveys

- 6.5.3 Ecological field surveys will comprise:
- Extended phase 1 habitat survey;

³² www.sitelink.nature.scot/home (Accessed 07/05/2026)

³³ www.opendata.nature.scot/datasets/ancient-woodland-inventory/explore (Accessed 08/05/2026)

- Great crested newt surveys (eDNA);
- Protected mammal surveys (badger, water vole, otter and badger); and
- Preliminary ground-level based (bat) roost appraisal (PRA) of trees and other potentially suitable structures.

- 6.5.4 The extended phase 1 habitat survey was carried out in accordance with the JNCC (2010) guidance in August 2025 and the study area comprised the boundary of the Site that was current at the time surveys were carried out. A summary of the main survey results is provided in **Section 6.3**.
- 6.5.5 Great crested newt surveys using the eDNA sampling methodology (Biggs et al., 2014) will be conducted of ponds on-site and within 500m of the Proposed Development, where access allows and where there is habitat connectivity (for example, where there are no major barriers for amphibian movements, such as an A-road, between the pond and the Site).
- 6.5.6 It is considered that the areas of the Site most likely to support places of shelter and to represent the highest value habitat for protected species are the field boundaries and areas of woodland or water. Given the intention to avoid and buffer these areas when designing the infrastructure layout, and the application of embedded and good practice mitigation measures during construction, it is considered that the only potential for impacts will be in relation to crossing or removal of small sections of boundary features to create access routes between different fields/land parcels. As such, targeted protected mammal surveys and ground-based PRA of trees and other potentially suitable structures in accordance with (NatureScot, 2024) and Collins (2023) respectively will be carried out within a relevant species-specific buffer (per NatureScot 2024) of areas of vegetation removal or construction works along, or in proximity to, field boundaries. These surveys will be undertaken in relevant areas once the Proposed Development layout has been refined and frozen, to inform the need for species specific mitigation and/or licensing requirements.
- 6.5.7 In accordance with NatureScot guidance (2025b), no bat activity surveys are proposed, as all linear bat habitat features will be buffered (watercourses, hedgerows and ditches by a minimum 10m and woodland by a minimum 20m) and permanent lighting is not proposed. Temporary lighting, where required, would be directed away from field boundaries which could be potential bat habitat features.
- 6.5.8 No reptile surveys are proposed given the suboptimal habitats on-site (arable and sheep-grazed improved grassland), and no fisheries surveys (or fish habitat surveys) are proposed as the Proposed Development will be appropriately offset from watercourses and pows. Any necessary watercourse crossings will be sensitively designed to allow the continued free passage of water and aquatic wildlife therein. In the event that any watercourse/pow crossings are required, these locations would be subject to a 'spot appraisal' to check for the suitability of the watercourse to support fish and whether any further fish surveys are required (ditches within the Site are typically minor, with stretches choked with vegetation and considered suboptimal for supporting fish).

Important Ecological Features (IEFs)

- 6.5.9 IEFs that will be considered within the assessment in the EIAR will include:

- Relevant statutory designated sites, and their cited qualifying interests, such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and National Nature Reserves (NNRs);
- Internationally or nationally important habitats (for example, habitats listed on Annex I of European Commission (EC) Habitats Directive³⁴), habitats of principal importance for biodiversity conservation in Scotland (Scottish Biodiversity List [SBL³⁵]); and
- Populations of ecological species listed on Annex IV of the EC Habitats Directive or Schedule 5 of the Wildlife & Countryside Act 1981 (as amended³⁶), or which are scarce, or a priority for conservation under SBL.

Assessment Methodology

- 6.5.10 CIEEM Guidelines (2018) for Ecological Impact Assessment (EclA) define a ‘significant effect’ as an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features (IEFs)’ or for biodiversity in general (for example, the feature could be beneficially or adversely significantly affected).
- 6.5.11 With regard to ecological impact assessment, the CIEEM Guidelines note that:
- ‘A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process.’*
- 6.5.12 In line with the principles of proportionate EIA, standard mitigation, including avoidance through the design process and application of industry standard good practice, will be considered at the outset of the assessment. IEF status will only be assigned where there is still considered to be the potential for significant effects on the identified feature arising from the Proposed Development after the application of standard mitigation measures.
- 6.5.13 Where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach to ensure that a reasonable realistic worst-case scenario has been assessed. Where uncertainty exists, this will be acknowledged.
- 6.5.14 Where the EIAR proposes measures to mitigate potentially significant adverse effects on ecological features, an assessment of residual ecological effects, taking into account any additional ecological mitigation recommended, will be undertaken.

³⁴ www.environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en (Accessed 07/05/2026)

³⁵ www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list (Accessed 07/05/2026)

³⁶ www.legislation.gov.uk/ukpga/1981/69/schedule/5 (Accessed 07/05/2026)

EcIA Methodology

- 6.5.15 The assessment of the potential for significant effects of the Proposed Development on ecological features to be presented within the EIAR will be based on the CIEEM guidelines (2018).
- 6.5.16 The assessment process will include the following stages:
- Determination and evaluation of IEFs;
 - Identification and characterisation of impacts (following consideration of standard mitigation, as summarised in **Section 6.3**);
 - Outline of additional mitigation measures to avoid and reduce significant impacts;
 - Assessment of the significance of residual effects after the implementation of such measures;
 - Identification of appropriate compensation measures to offset significant residual effects; and
 - Identification of opportunities for ecological enhancement.
- 6.5.17 The EIAR will seek to demonstrate notable habitat enhancement and to leave the Site in a better ecological condition than it was found, in accordance with NPF4.
- 6.5.18 The EIAR will be supported by technical appendices detailing the desk study results, consultation, survey methods and results, and will be further supported by relevant figures, tables and photographs, where necessary. Where sensitive data is recorded, the EIAR will be supported by confidential appendices and/or figures which would not be released into the public domain.
- 6.5.19 The assessment within the EIAR will assess in detail impacts upon IEFs, for example, those that are considered important and potentially significantly affected by the Proposed Development.
- 6.5.20 Relevant European, national and local legislation policy and guidance will be referred to in order to determine the importance (or ‘sensitivity’) of ecological features. In addition, importance will also be determined using professional judgement, the results of baseline surveys and the importance of features within the context of the geographical area.
- 6.5.21 Importance will not necessarily relate solely to the level of legal protection that a feature receives: ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species, or the geographical location of species relative to their known range.
- 6.5.22 The importance of ecological features will be defined in a geographical context from “Site” to “International”, as set out in **Table 6.2**.
- 6.5.23 The identification and characterisation of impacts on IEFs will be undertaken in accordance with the CIEEM Guidelines (2018), with reference made to magnitude (for example, area or

number of individuals of a species to be impacted, extent, duration and reversibility, as appropriate). The magnitude of impact criteria is provided in **Table 6.3**.

- 6.5.24 Impacts will be considered during the construction, operation and decommissioning phases of the Proposed Development and will be assessed on the basis that a clearly defined range of avoidance and standard best practice measures are implemented (as summarised in **Section 6.3**).

Sensitivity

Table 6.2: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High – International/ National	An internationally or nationally designated site (for example, SAC, Ramsar site) or candidate site (for example, cSAC) and/or SSSI). Large areas of priority habitat listed under Annex 1 of the Habitats Directive, and smaller areas of such a habitat that are essential to maintain the viability of that ecological resource. Or significant extents of a priority habitat identified in the SBL, or smaller areas which are essential to maintain the viability of that ecological resource. A regularly occurring, nationally or regionally significant population of any internationally or nationally important species, listed under Annex 2 or Annex 4 of the Habitats Directive, or Schedule 1 or Schedule 5 of the Wildlife and Countryside Act, or as a priority species on the SBL.
Medium – Regional	Viable areas of key semi-natural habitat identified in the UKBAP. A regularly occurring, locally significant population of any nationally important species listed on the SBL, and species listed under Schedule 5 of the Wildlife and Countryside Act or Annex 2 or Annex 4 of the Habitats Directive. Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including extensive areas of semi-natural woodland.
Low – Local	Other species of local conservation value. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context (for example, species-rich flushes or hedgerows).
Negligible - Site	All other species and habitats that are widespread and common and which are not present in locally, regionally or nationally important numbers, or habitats which are considered to be of poor ecological value. Areas of habitat or species considered of value up to the site only level. Note, features valued at site-level will not be considered in detail in the assessment.

Magnitude of Impact

Table 6.3: Magnitude of Impact Criteria

Magnitude	Criteria
High	The impact (either on its own or cumulatively with other proposals) may adversely, or beneficially, affect the conservation status of a designated site and/or species population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest. This may include the permanent total or almost complete loss of a designated site and/or species/habitat status or productivity.
Medium	The impact (either on its own or cumulatively with other proposals) would not adversely, or beneficially, affect the conservation status of a designated site and/or species in the long-term, but some element of the functioning might be affected, and impacts could potentially affect its ability to sustain some part of itself in the short to medium-term.
Low	Neither the above or below applies, but some observable adverse, or beneficial, impact is evident on a short-term basis or affects the extent of a habitat/species abundance in the local area.
Negligible	A very slight (indiscernible) reduction, or increase, in a habitat/species status or productivity and/or no observable effect.

Significance of Effect

- 6.5.25 CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIAR to determine 'significant' and 'not significant' effects. For the purposes of the assessment outlined herein, **Table 6.4** sets out adapted CIEEM terminology and equivalent in the context of the EIA Regulations 2017.
- 6.5.26 Effects assessed as moderate or major are considered likely to represent significant effects in the context of the EIA Regulations, although professional judgement will be applied on a case-by-case basis with justification provided for conclusions reached.
- 6.5.27 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged in the EIAR chapter.

Table 6.4: Effect (EIA Significance)

Significance	Definition	
Significant	Major Adverse/ Beneficial	A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ecological feature at a national (Scottish) or international level.

Significance	Definition	
	Moderate Adverse/ Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ecological feature at a regional level or above.
Not Significant	Minor Adverse/ Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a regional level or below.
	Negligible/ Low Adverse/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ecological feature, typically at a local level or below.

Cumulative Assessment

- 6.5.28 The potential for cumulative effects on ecological features, in-combination with other major development proposals will be assessed in accordance with NatureScot guidance (2025b) but will be restricted to those developments located within the same hydrological catchment(s) or within the regular range of mobile species (for example, otter and bats).
- 6.5.29 The assessment will encompass the effects of the Proposed Development in-combination with existing developments, either built or under construction; approved developments; awaiting implementation; and proposals awaiting determination within the planning process with design information in the public domain.

Habitats Regulations Appraisal

- 6.5.30 As part of the assessment, it is necessary to consider whether the Proposed Development will have a likely significant effect (LSE) on areas that have been internationally designated for nature conservation purposes (for example, European sites). European sites are protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) in Scotland. The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (the Withdrawal Act). However, the most recent amendments to the Habitats Regulations – the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (The Habitats Regulations) – make it clear that the need for Habitats Regulations Appraisal (HRA) continues to apply.
- 6.5.31 Whilst HRA decisions must be taken by the competent authority, the information needed to undertake the necessary assessments must be provided by Halfway Energy Park Ltd. The information needed for the competent authority to establish whether there are any likely significant effects (LSEs) from the Proposed Development and to assist in carrying out its Appropriate Assessment, will be provided in a shadow HRA Report. This will concern those SACs listed in **Table 6.1**, and for avoidance of doubt, these are the River Tay SAC and Firth of Tay and Eden Estuary SAC.

6.6 Potential Significant Effects³⁷

6.6.1 The following potential significant effects will be assessed in the EIAR with consideration that impacts on field boundary vegetation/hedgerows (if any) would be small-scale and localised to allow vehicle access:

- River Tay SAC (with respect to the qualifying species, otter only) during the construction and decommissioning phases given the potential for otter to range and disperse over considerable distances.
- Notable habitats (Annex I/SBL habitats and potential GWDTEs) during the construction and decommissioning phases, given the Proposed Development layout is not yet frozen and thus the precise habitats to be impacted is unknown.
- Protected mammal species during the construction and decommissioning phases, with surveys to identify any evidence of mammal species within an appropriate zone of influence of construction areas yet to be conducted.
- Roosting bats during the construction and decommissioning phases, with surveys to identify any suitable bat roost features within an appropriate zone of influence of construction areas yet to be conducted.

6.7 Approach to Mitigation

6.7.1 In accordance with the principles of proportionate EIA, standard mitigation measures (to include mitigation by design and standard good practice protocols as summarised in **Section 6.3**), will be considered at the outset of the assessment process, in determining the likely sensitivity of ecological features, refer to **Table 6.2** in the context of the Proposed Development. Standard mitigation includes measures to ensure works proceed in a legally compliant manner (such as the protection of badger setts) and standard good practice pollution prevention protocols to preclude the potential for watercourses on-site (and downstream from the Site) being impacted by run-off or chemical pollution. Full details of standard mitigation measures to be adopted in relation to ecology will be detailed within the EIAR. It is proposed that most of the proposed standard mitigation measures would be covered in an oCEMP, to be finalised as a CEMP, which would be a condition of the Proposed Development.

6.7.2 If the assessment predicts a significant effect on an IEF, additional mitigation measures that would be implemented will be presented in the EIAR, and a further assessment undertaken to assess significance of residual effects on the IEF after the implementation of the additional mitigation.

³⁷ Note that the term 'likely significant effect' is not used for the EclA to avoid confusion with screening for Likely Significant Effects (LSE) as part of the Habitats Regulations Appraisal (HRA) process.

6.8 Matters Scoped Out

- 6.8.1 It is proposed that the potential for effects (at all phases of the Proposed Development) upon statutory designated sites for nature conservation (without mobile qualifying criteria) located greater than 2km from the Site, or for which standard mitigation and good practice will be sufficient to prevent any impacts, is scoped out of the assessment. It is considered that potentially significant effects on such designations can be precluded on the basis of spatial separation and due to the static nature of the qualifying habitat and species interests, and thus lack of impact pathways.
- 6.8.2 Impacts of the Proposed Development for all statutory designated sites listed in **Table 6.1** will be scoped out of detailed assessment in the EIAR, with the exception of the River Tay SAC and otter as a qualifying feature, at the construction and decommissioning phases given the potential widespread dispersal and movement of the species. The nearest statutory designated site to the Site is the Firth of Tay and Eden Estuary SAC/SSSI, designated for coastal/estuarine habitats and for the SAC, common seal. It is considered that given the spatial separation and the implementation of standard mitigation including the Proposed Development being offset from all watercourses and works being carried out under a CEMP, impacts on the SAC/SSSI can be precluded. Activities during the operation phase would be typically modest and no impacts on any statutory site with ecological interests are predicted during that phase.
- 6.8.3 Impacts to existing common and widespread habitats of low sensitivity and/ or conservation interest, such as arable fields and improved grazing pasture are proposed to be scoped out of the assessment; the application would include a commitment for habitat enhancement and it can therefore be reasonably assumed that the effects of the Proposed Development would outweigh any potential for negative effects on such habitats.
- 6.8.4 Impacts on foraging/commuting bats are scoped out of detailed assessment, given the key bat habitat features on-site would be retained³⁸, with the Proposed Development offset from field boundary vegetation (hedgerows/treelines) watercourses, pows and ditches.
- 6.8.5 Due to the unsuitability of habitat on-site (largely arable and sheep grazed improved grassland) for reptiles, impacts on reptiles are scoped out of detailed assessment.
- 6.8.6 The Proposed Development will be appropriately offset from watercourses and pows, and any necessary watercourse crossing will be sensitively designed to allow the continued free passage of water and aquatic wildlife within. Pollution prevention controls as part of a CEMP would be implemented to protect watercourses during works. Impacts on fisheries is accordingly scoped out of detailed assessment.
- 6.8.7 Even for those ecological features scoped out of assessment, consideration will, however, be afforded to the provision of standard mitigation on these features, and this would be integrated into a CEMP.
- 6.8.8 Any lighting required during construction, operation and decommissioning of the Proposed Development will be temporary and / or low impact (for example, Passive Infrared (PIR))

³⁸ Only localised opening of some hedgerows would be a possibility for access.

lighting). Lighting will be directed away from trees, hedgerows and other surrounding habitats. On the basis that lighting is designed in a sensitive manner, no discernible effects are anticipated on biodiversity during the construction, operation and decommissioning phases of the Proposed Development and therefore an assessment of lighting effects is proposed to be scoped out of the assessment.

- 6.8.9 It is considered that impacts of the Indicative Underground Cable Route Corridors on IEFs would be limited and readily mitigated by good practice during both construction and operation, as discussed above, and such impacts are scoped out of assessment.

6.9 Questions to Consultees

- Do consultees agree with the range of desk study sources and ecology surveys considered to inform the design and assessment of the Proposed Development? Including bat activity surveys, reptile surveys and fisheries surveys not being undertaken.
- Do consultees agree with the approach to protected mammal surveys and ground-level PRA, that these would be undertaken once the Proposed Development's design has been frozen so are focused and targeted to areas that may experience potential impacts?
- Are there any other relevant consultees/data sources who may have relevant data and/or who should be contacted with respect to the ecology assessment and scope of baseline information gathering?
- Do consultees agree with those features that have been scoped out of assessment in respect to ecology (and the justification provided for the decision)?
- Do consultees agree with the proposed approach to the CIA? Are there any specific developments that should be considered in the CIA?
- Do consultees agree that it is reasonable to consider standard mitigation at the outset of the assessment and to scope out ecological features for which standard mitigation will be sufficient to prevent significant effects of detailed assessment?

6.10 References and Guidance

- Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C. & Griffiths, R. A. (2014). Analytical and methodological development for improved surveillance of the great crested newt. Defra Project WC1067.
- CIEEM (2018, revised in 2024). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.
- Collins, J. (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition.
- JNCC (2010). Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough.

- Scottish Environmental Protection Agency (SEPA) (2014). Land use planning system SEPA guidance Note 31.
- SEPA (2017). Guidance on Assessing the Impacts of Groundwater Abstractions and Groundwater Dependant Terrestrial Ecosystems (GWDTEs).
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- Scottish Government (2024) The Scottish Biodiversity Strategy to 2045. 27 November 2024. Available at: www.gov.scot/publications/scottish-biodiversity-strategy-2045/
- Tayside Biodiversity Partnership (2016). Tayside Local Biodiversity Action Plan. 2nd Edition 2016-2016. Available at: www.angus.gov.uk/sites/default/files/Tayside%20Local%20Biodiversity%20Action%20Plan%202016_2026.pdf

7 ORNITHOLOGY

7.1 Introduction

- 7.1.1 This chapter of the Environmental Impact Assessment Scoping Report (EIASR) provides consideration of the potential significant effects of the Proposed Development on the environment with respect to ornithology. It provides a summary of baseline ornithological information collected to date, and the further baseline data (desk and field) that will be collected to inform the assessment of the impacts and likely significance of associated effects of the Proposed Development.
- 7.1.2 An overview of ornithological features determined as likely to represent 'Important Ornithological Features' (IOFs), and subsequently to require consideration within the EIA Report (EIAR), is provided. A description of the approach to Ecological Impact Assessment (EcIA) and proposed assessment methodology is also provided for consultees consideration and comment.

Zone of Influence and Study Area

- 7.1.3 The Ornithological 'zones of influence' is an area which may be affected by biophysical changes as a result of the Proposed Development. The zones of influence that extend beyond the direct land-take required for the Proposed Development have been identified based upon the nature of the Proposed Development and the construction, operation and decommissioning phase activities to be undertaken. The zone of influence will therefore vary for different ornithological features depending on their sensitivity to an environmental change (for example change of landscape, loss of land). The identified Zones of Influence have been used to define the scope of the baseline ornithological surveys and the extent of the desk study.
- 7.1.4 The study area is defined as the area that was physically surveyed to establish baseline conditions.

Zone of Influence

- 7.1.5 The following Zone of Influence have been applied with respect to ornithology:
- Statutory designated international sites - the Site and 20km radius however, beyond this will be considered if appropriate.
 - Statutory designated national sites - the Site and 10km radius.

Study Area

- 7.1.6 The following study areas have been applied to the field surveys:
- Breeding bird surveys, 50m radius; and
 - Non-breeding bird surveys, 500m radius.

7.2 Legislation Policy and Guidance

Legislation

- 7.2.1 The ornithological assessment has been undertaken with reference to the following key legislation and international conventions relevant to the protection of birds and their habitats in Scotland:
- Convention on Wetlands of International Importance (the Ramsar Convention);
 - Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive) as retained in UK law;
 - Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) as retained in UK law;
 - The Conservation of Habitats and Species Regulations 2017 (as amended in Scotland);
 - The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
 - Wildlife and Countryside Act 1981 (as amended in Scotland);
 - Nature Conservation (Scotland) Act 2004;
 - Wildlife and Natural Environment (Scotland) Act 2011;
 - The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
 - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and
 - The Climate Change (Scotland) Act 2009.

Policy

National Planning Framework 4

- 7.2.2 The National Planning Framework 4 (NPF4) sets out national planning policies relevant to biodiversity and ornithological interests. Policy 3 (Biodiversity) requires development proposals to conserve, restore and enhance biodiversity, with National, Major and Environmental Impact Assessment (EIA) development expected to deliver significant beneficial effects for biodiversity. Policy 4 (Natural Places) seeks to protect, restore and enhance natural assets, including habitats, soils and peatland that support biodiversity and protected species, including birds.

Scottish Government Biodiversity Guidance

- 7.2.3 Scottish Government Planning Guidance: Biodiversity provides guidance on the implementation of NPF4 in relation to biodiversity protection and enhancement, including the

avoidance and mitigation of ecological impacts, long-term habitat management and ecological assessment requirements.

Scottish Government Biodiversity Strategy

- 7.2.4 Scottish Biodiversity Strategy to 2045 national objectives include the halt to species declines by 2030 and to restore nature by 2045. ³⁹
- 7.2.5 The Scottish Biodiversity Strategy Delivery Plan 2024–2030 identifies practical actions for species recovery, including measures relevant to bird populations and habitat enhancement, and provides additional policy support for the protection and restoration of habitats.

Local Policy

- 7.2.6 Reference will be given to the following key pieces of local policy:
- Perth and Kinross Local Developmental Plan 2 (2019); and
 - Tayside Local Biodiversity Action (2016).

Guidance

- 7.2.7 The following guidance documents have informed the scope, methodology and assessment approach for the ornithological assessment:
- NatureScot guidance on assessing connectivity with Special Protection Areas (SPAs), including consideration of functionally linked land⁴⁰;
 - NatureScot guidance relating to functionally linked land and ornithological impact assessment;
 - NatureScot (2025) NatureScot pre-application guidance for solar farms⁴¹;
 - NatureScot Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms, where relevant to survey design and methodology;
 - Chartered Institute of Ecology and Environmental Management (CIEEM). Guidelines for Ecological Impact Assessment in the UK and Ireland;

³⁹ Scottish Government (2022) Scottish biodiversity strategy to 2045: tackling the nature emergency in Scotland. Edinburgh: Scottish Government. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2022/12/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/scottish-bi> (Accessed: 6 May 2026).

⁴⁰ Scottish Natural Heritage (2016) Assessing connectivity with Special Protection Areas (SPAs): guidance (Version 3 – June 2016). Available at: <https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf> (Accessed: 28 May 2026).

⁴¹ NatureScot (2025) NatureScot pre-application guidance for solar farms (Version: June 2025). Available at: <https://www.nature.scot/doc/naturescot-pre-application-guidance-solar-farms> (Accessed: 28 May 2026)

- British Trust for Ornithology (BTO) survey methodology guidance, where applicable;
- Scottish Environmental Protection Agency (SEPA) (2014). Land-use Planning System: SEPA Guidance Note 31;
- Birds of Conservation Concern 5: The population status of birds in the United Kingdom, Channel Islands and Isle of Man; and
- Scottish Biodiversity List (SBL).

7.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

Site Description

- 7.3.1 The Proposed Development Site, as shown in **Figure 2.2**, is an area of predominantly lowland agricultural and grazing land approximately 11km east of Perth and 9km southwest of Dundee, broadly between the settlements of Inchture, Errol and Rait. It is bisected by the A90 trunk road and railway running between Perth and Dundee; and parallel 275kV and 132kV overhead transmission lines between Dundee and Abernethy substation.
- 7.3.2 The study area is flat and is predominantly used for arable farming; during surveys in 2025 this principally comprised wheat and oil-seed rape. There are also some areas of sheep-grazed improved grassland. There are several scattered small pockets of planted broadleaved or mixed woodland, and numerous hedgerows, lines of (and scattered) mature trees, watercourses, ditches and Pows, which form the boundaries to the farmed fields. The Site overall is relatively open in nature, and accordingly, across most of the Site, habitats with potential ecological value are restricted to the field boundaries and wooded areas.

Desk Study Results- Designated Sites

Statutory, National and Locally Designated Sites of Nature Conservation

- 7.3.3 A desk study was undertaken to identify statutory and non-statutory designated sites of nature conservation interest within the defined Zone of Influence for ornithology (**Paragraph 7.1.3**). The purpose of the desk study was to determine the presence of European, national and local designated sites with potential ornithological connectivity and relevance to the Proposed Development, and to inform the scope of field surveys and subsequent assessment.
- 7.3.4 The results of the desk study are presented in **Table 7.1** below, together with an initial consideration of potential ornithological connectivity between the Proposed Development and each designated site. This connectivity assessment is indicative only at this stage and is subject to further refinement through field survey data and the detailed ecological impact assessment

Table 7.1: Statutory Sites located within the Defined Zone of Influence of the Proposed Development (shown in Figure 7.1) and Distance from Land Parcels (as defined in Figure 2.1)

Designation	Distance from Site	Qualifying Features	Potential linkage and Relevance
Firth of Tay and Eden Estuary SPA and Ramsar	Directly adjacent to land parcel I05	Non-breeding: Bar-tailed godwit, common scoter, cormorant, dunlin, eider, goldeneye, goosander, grey plover, greylag goose, black-tailed godwit, long-tailed duck, oystercatcher, pink-footed goose, red-breasted merganser, redshank, sanderling, shelduck, velvet scoter and the waterfowl assemblage (under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl.) Breeding: Marsh harrier, little tern	Potential connectivity may exist for qualifying waterfowl species utilising surrounding agricultural land for foraging, commuting and roosting. Further consideration of functionally linked land may be required.
Inner Tay Estuary SSSI	Adjacent to land parcel I05	The site is designated for its ornithological interest, supporting nationally important populations of greylag goose (non-breeding), pink-footed goose (non-breeding), cormorant (non-breeding), and goldeneye (non-breeding). The site also supports important breeding populations of bearded tit, marsh harrier and water rail, in addition to an important breeding bird assemblage.	Potential connectivity may occur via commuting and foraging activity associated with adjacent farmland habitats.
Outer Firth of Forth and St. Andrews Bay Complex SPA	16.2km from land parcel K04	The breeding bird qualifying features of the SPA include Arctic tern, common tern, gannet, guillemot, herring gull, kittiwake, Manx shearwater, puffin and shag, together with a breeding seabird assemblage representing the wider importance of the site for seabird populations. The non-breeding bird qualifying features of the SPA include black-headed gull, common gull, common scoter, eider, goldeneye, guillemot, herring gull, kittiwake, little gull, long-tailed duck, razorbill, red-breasted merganser, red-throated diver, shag, Slavonian grebe and velvet scoter, alongside non-breeding seabird and waterfowl assemblages that reflect the site's	Limited potential for connectivity.

Designation	Distance from Site	Qualifying Features	Potential linkage and Relevance
		wider importance for overwintering and passage bird populations.	
South Tayside Goose Roosts SPA and Ramsar	19.7km from land parcel H01	Non-breeding greylag goose and pink-footed goose assemblages.	Potential connectivity may exist where suitable agricultural foraging habitat is present within or surrounding the Site. However, according to Mitchell (2012) foraging and roosting areas for the listed geese are shrinking and confined to certain SPA populations (refer to Paragraphs 7.8.8 to 7.8.11).

Surveys

- 7.3.5 Non-breeding and breeding bird surveys commenced in 2025. One full season of breeding bird surveys will be completed; however, due to the evolution of the Proposed Development, it is currently proposed that the surveys will be undertaken across two years to include additional land incorporated into the final Proposed Development area. Due to the incorporation of Potential Additional Options into the Site part way through the breeding season surveys in 2026, these recent additions will have three rather than four Breeding Bird Survey visits. Review of habitat conditions confirms that the parcels comprise unsuitable sward heights, particularly for breeding waders and other species of conservation concern. Consequently, the reduced survey effort does not materially affect confidence in the breeding bird baseline for lowland farmland and is not expected to influence the identification of IOFs and does not alter the conclusions of the assessment. As such, this will be addressed in the 'Limitations' or similar section in the Ornithology Chapter of the EIAR.
- 7.3.6 Non-breeding bird surveys will provide a two-year baseline. These surveys commenced in September 2025 and are anticipated to be completed in 2027.
- 7.3.7 Methods of these are detailed below.

Methods

- 7.3.8 Non-breeding bird surveys have been undertaken from September 2025 to the present. The surveys comprise one diurnal visit per month, conducted using the 'look-see' method (Bibby et al., 2000). Survey coverage included the Site and an area extending approximately 500m beyond the Site boundary (the study area). Survey methods and timing were also informed by relevant Scottish guidance, including NatureScot guidance on bird survey methods and disturbance avoidance (NatureScot, 2017; 2025⁴²).
- 7.3.9 Breeding bird surveys were conducted once per month between April and July 2025, and to date in May and June 2026, and have followed lowland waders' methodology (detailed in

⁴² NatureScot (2025) NatureScot pre-application guidance for solar farms. Version June 2025. Available at: <https://www.nature.scot/doc/naturescot-pre-application-guidance-solar-farms> (Accessed: 8 May 2026).

Gilbert *et al.*, 1998⁴³), in accordance with current NatureScot guidance for lowland farmland (NatureScot, 2025), where wetland features are present. Surveys covered the Site and an appropriate buffer area (50m study area), with all suitable habitats walked to within approximately 50m of the survey route. Surveys recorded all Priority species, BoCC5, Schedule 1, Annex 1 and SBL.

- 7.3.10 Survey visits were undertaken during suitable weather conditions and within the recommended breeding season survey period.

Non-breeding Survey Field Results (September 2025-February 2026)

- 7.3.11 Five SPA and Ramsar site qualifying species potentially associated with Firth of Tay and Eden Estuary SPA and Ramsar, Outer Firth of Forth and St. Andrews Bay Complex SPA and South Tayside Goose Roosts SPA and Ramsar were recorded during the non-breeding period within the Site (refer to **Paragraphs 7.3.12-7.3.17**). These include black-headed gull, common gull, herring gull, greylag goose and pink-footed goose. Refer to **Table 7.2** for maximum counts across the survey period of September 2025 to February 2026 and refer to **Figure 2.1** for land parcel references.
- 7.3.12 Black-headed gull was largely recorded adjacent to, and outside of, the Site. The largest peak count of black-headed gull within the Site was of 90 birds recorded within land parcel I04 during February 2026.
- 7.3.13 Herring gull was recorded largely within land parcels B01-B03, with two maximum peak counts recorded in September of 430 and 500 birds. However, these large counts were due to the farming activities being completed on-site for example fresh ploughing. Note that during the remaining months, this species were recorded in 100 birds or less.
- 7.3.14 Similarly larger counts of common gull were also associated with farming practices, however, a few peak counts of ~350 were recorded largely during the passage period and within land parcel K03.
- 7.3.15 Greylag goose was recorded on one occasion with a single bird in January 2026, adjacent to the Site.
- 7.3.16 Pink-footed goose was largely associated with land parcels K03 and I03, where peak counts of 2,200 individuals (January) and 1,280 individuals (February) were recorded. However, these peak numbers were not consistently maintained across the wider survey area, and notably not within the Site itself.
- 7.3.17 Across the survey period (September 2025 to February 2026), counts of pink-footed goose ranged from 0 to 2,200 individuals. The highest numbers were recorded during January, with an average count of 487 individuals, and February, which included a single peak count of 1,280 individuals, all located within the Site, mainly in the northern extent.

⁴³ Gilbert, G., Gibbons, D.W. & Evans, J. (1998). Bird Monitoring Methods: A Manual of Techniques for Key UK Species. Sandy: RSPB.

Table 7.2: SPA and Ramsar Features Recorded During the Non-breeding Bird Surveys (September to March) are Presented. Peak Counts Recorded Adjacent to the Site Relate to Fields Directly Bordering the Site, while the Study Area is Defined as Fields Located Beyond the Immediately Adjacent Fields.

Species names	September	October	November	December	January	February	March
Within the Site							
Black-headed Gull	65	85	5		4	90	
Common Gull	252	330	44		120	350	30
Herring Gull	500	99	26	1	86	35	2
Pink-footed Goose	17	114		800	2200	1280	30
Directly Adjacent to the Site							
Black-headed Gull			35	3		150	
Common Gull	7	37	85	240	110	180	62
Greylag Goose					1		
Herring Gull	4	11	27	9		71	2
Pink-footed Goose			350	310	370	620	
Outside of the Site							
Black-headed Gull	108	25	4	120	170	230	1
Common Gull	79	370	14	460	540	350	60
Herring Gull	378	320	6	20	5	2	10
Pink-footed Goose			131	570	80	1	

Breeding Bird Survey Field Results (April 2025-July 2025)

- 7.3.18 A total of 67 species were recorded across the breeding period, this comprised of mainly passerine species. 10 BoCC5 red listed species and 21 Amber listed species.
- 7.3.19 Ground nesting species recorded as potentially breeding within the Site include curlew (one territory), grey partridge (one to two territories), lapwing, meadow pipit, oystercatcher, reed bunting and skylark. Note that breeding territories are yet to be analysed and fully assessed.
- 7.3.20 One hen harrier was recorded; however, it was confirmed as a 2nd calendar year, non-breeding male and was only recorded on one occasion. Other Schedule 1 birds included one peregrine falcon observed flying over the Site on one occasion and two records of red kite, which included an immature bird recorded in June 2025. No definitive breeding behaviour was recorded within or surrounding the Site and no suitable habitat for breeding peregrine exists within the Site and wider area.

Key Sensitivities

- 7.3.21 Baseline data from the field surveys indicate the presence of Important Ornithological Features (IOF) within and surrounding the Site.
- 7.3.22 Many of these features are associated within the closest SPA and Ramsar Sites, specifically the Firth of Tay and Eden Estuary SPA and Ramsar, South Tayside Goose Roosts SPA and Ramsar and Outer Firth of Forth and St. Andrews Bay Complex SPA, which support comparable species assemblages.
- 7.3.23 The following species groups are considered IOFs based on survey results and conservation status, legal protection and/or their status as qualifying features of nearby designated sites:
- Schedule 1 species;
 - Ground nesting birds – BoCC5 (Red and Amber Listed) and SBL species); and,
 - Mobile qualifying species associated with the international designated sites Firth of Tay and Eden Estuary SPA and Ramsar and South Tayside Goose Roosts SPA and Ramsar.
- 7.3.24 Of these sensitivities, breeding ground nesting birds and the potential for connectivity with SPA/Ramsar sites are considered the primary features for consideration of potential significant effects.
- 7.3.25 Note that although the Proposed Development is not located within an internationally designated site, qualifying bird species associated with these designations may utilise land within and surrounding the Site as functionally linked land (FLL). Therefore, potential indirect effects on the integrity of these designated sites via impacts to FLL are scoped into the assessment. FLL will be identified based on evidence of regular use by qualifying species, including frequency of occurrence, behaviour (e.g. foraging or roosting), and comparison with relevant SPA/Ramsar population data (including Wetland Bird Survey Data; WeBS-derived thresholds where appropriate).

Potential Sources of Impact

7.3.26 Potential sources of impact on ornithological features during construction, operation and decommissioning phases of the Proposed Development may include:

- Disturbance and displacement from maintenance and replacement activities (e.g. major campaign replacement, plant, vehicle and personnel presence) which may result in temporary displacement of IOFs, particularly ground-nesting birds, nesting Schedule 1 birds and SPA and Ramsar species;
- Habitat and/or land which supports qualifying features and modification from long-term change in land use from arable to Photovoltaic (PV) infrastructure;
- Barrier effects and habitat fragmentation via the presence of PV infrastructure within the Site;
- Indirect effects on land which supports qualifying features (if present) if the Site is used by SPA and Ramsar qualifying features;
- Glint and Glare effects arising from PV panels may create reflective surfaces, which could potentially influence bird behaviour (e.g. lake effect), although the evidence for significant effects is limited;
- Cumulative effects, where disturbance, displacement, or habitat loss may interact with other proposed or existing renewable developments in the surrounding area, leading to additive or synergistic impacts on shared bird populations; and
- Habitat loss, fragmentation or change as a result of the delivery and installation of Proposed Development infrastructure.

7.3.27 Potential beneficial impacts during the operational phase may include:

- Habitat enhancement by the creation of managed botanically diverse grassland and reduced agricultural intensification will likely enhance foraging and breeding opportunities;
- Reduced disturbance compared to the existing agricultural practices across the Site;
- Reduction of chemical use across the landscape;
- Potential of extension of support for non-breeding and breeding birds via managed grasslands and habitats dependent on habitat quality and management;
- Indirect benefits of solar farms, which has been evidenced to increase fauna and flora, particularly in relation to breeding bird species; and
- Retention and enhancement of hedgerows, providing valuable habitat for boundary-associated species, particularly passerines, and supporting nesting, foraging, and sheltering opportunities.

- 7.3.28 These beneficial effects are contingent upon the delivery of a detailed Landscape Ecological and Management Plan (LEMP) for the Proposed Development.
- 7.3.29 The magnitude and significance of operational effects will be dictated by the final design layout, habitat management and management proposals and the extent to which the Site is utilised by both breeding and non-breeding birds.

Design Considerations

- 7.3.30 The Proposed Development is currently evolving through an environmentally led iterative design evolution process.
- 7.3.31 The full design iteration process will be outlined in the EIAR including all design mitigation measures which informed the evolution of the Proposed Development design. Those relevant to ornithology are likely to include:
- The construction compounds will be located on low diversity habitat, where practicable, and will be located as far as practicable from sensitive features;
 - Opportunities to retain grazing under panels will be explored and considered alongside other compatible land uses as measures to maximise biodiversity; however, for the purposes of the scoping phase, a precautionary approach will be adopted whereby machine-based vegetation management is assumed, unless grazing represents a demonstrably worse-case scenario for biodiversity outcomes;
 - Up to a 50m buffer will be applied between the Proposed Development and ancient woodland (listed on the AWI), with up to 30m between the Proposed Development and other woodland;
 - A minimum buffer of 50m from designated sites (Inner Tay Estuary SSSI and Firth of Tay and Eden Estuary SPA/Ramsar); and
 - Areas within the Site boundary to be retained for mitigation and enhancement areas.

Plans and Standard Good Practice Measures

- 7.3.32 The EIAR will include as a minimum:
- An outline Construction Environment Management Plan (oCEMP); and
 - An outline Landscape and Ecological Management Plan (oLEMP); or equivalent biodiversity/habitat management and enhancement plan.
- 7.3.33 The oCEMP will describe measures to be implemented during the construction process and would include commitments to Species Protection Plans, Reasonable Avoidance Measures (RAMs), pre-construction surveys and appropriate derogation licenses (as required) as well as pollution (including dust) prevention and sediment run-off control, managed construction lighting and noise / traffic management measures.
- 7.3.34 The oLEMP (or equivalent) would be designed to ensure delivery of the Proposed Development's habitat management and enhancement strategy, and in accordance with NPF4 and corresponding local policy.

- 7.3.35 In the event that impacts cannot be avoided, appropriate additional mitigation measures would be implemented, and this would be detailed in the impact assessment.

7.4 Consultation

- 7.4.1 It is understood that there is no active local environmental records centre (LERC) covering the Site and surrounds. However, the Tayside Biodiversity Partnership will be approached for any relevant ornithological records (within 2km of the Site) given the partnership has a number of working and interest groups, so there may be relevant ecological information available for purchase. This will be extended to request details of any non-statutory sites within 2km of the Site.
- 7.4.2 Engagement will also be made with NatureScot, local raptor group (Tayside and Fife) and Scotland's Bird Club (Angus and Dundee and Perth and Kinross recording areas). Note that engagement with NatureScot is in progress and will be undertaken during summer 2026.

7.5 Assessment Methodology

- 7.5.1 This section describes the methodology proposed for the assessment of effects on Ornithology, including the criteria for the determination of the importance of the feature and the magnitude of change from baseline conditions.

Assessment Methodology

- 7.5.2 The assessment of potential ornithological effects will be undertaken in accordance with the principles of the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland and relevant NatureScot guidance.
- 7.5.3 Potential effects arising from the Proposed Development will be assessed with reference to:
- The importance and sensitivity of ornithological features;
 - The magnitude of predicted impacts;
 - The geographic extent of effects;
 - Duration, timing and reversibility of effects; and,
 - The effectiveness of embedded and additional mitigation measures.
- 7.5.4 Consideration will also be given to the potential for effects on areas that support qualifying SPA bird species, where relevant.

Sensitivity

Table 7.3: Ornithological Sensitivity of Features

Ornithological Sensitivity	Criteria
High - International and National	Internationally designated sites (e.g. SPA or Ramsar sites), qualifying species and habitats of international conservation importance, or species populations of international importance. A regularly occurring or nationally significant population of any internationally or nationally important species, listed under Annex 2 or Annex 4 of the Habitats Directive, or Schedule 1 or Schedule 5 of the Wildlife and Countryside Act, or a SBL priority species.
Medium - Regional	Regionally important bird populations, habitats or assemblages, including species of principal conservation concern and habitats supporting notable ornithological interest.
Low	Habitats and species of limited or negligible ecological importance, including areas with minimal suitability for ornithological features.
Negligible - Site	Species considered of value up to the Site only level (common and widespread). Note, these features are not considered in this assessment.

Magnitude of Impact

Table 7.4: Magnitude of Impact Criteria

Magnitude of Effect	Criteria
High	The change (alone or cumulatively) may adversely or beneficially affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function, that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Medium	Conservation status of a site or species population (alone or cumulatively) will not be adversely or beneficially affected, but some element of the functioning of the site or population might be affected and the change to the site and/or population is likely to be significant in terms of its ability to sustain some part of itself in the long-term.
Low	Neither of the above applies, but some minor adverse or beneficial change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

Significance of Effect

- 7.5.5 CIEEM guidelines define a significant effect as an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general (for example the feature could be beneficially or adversely significantly affected).
- 7.5.6 CIEEM guidelines on ecological impact assessment note that, "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused

planning permission. For example, many projects with significant adverse ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

- 7.5.7 CIEEM guidelines do not recommend the sole use of a matrix table as commonly set out in EIAR chapters to determine 'significant' and 'not significant' effects. For the purposes of this assessment presented herein, **Table 7.5** sets out adapted CIEEM terminology and equivalent in the context of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations).

Table 7.5: Effect (EIA significance). Note, that Major and Moderate Effects are Considered Significant in the Context of the EIA Regulations

Significance	Definition	
Significant	Major Adverse/Beneficial	An adverse or beneficial effect resulting in a permanent or long-term change to the integrity of an ecological feature of national or international importance, such that its structure, function, or conservation status is fundamentally altered.
	Moderate Adverse/Beneficial	An adverse or beneficial effect resulting in a medium to long-term change to the integrity of an ecological feature of regional importance (or higher), affecting its structure or function but not fundamentally compromising its conservation status.
Not significant Significant	Minor Adverse/Beneficial	An adverse or beneficial effect resulting in a -term and/or reversible change to the integrity of an ecological feature of local importance (or below), with no lasting effect on its structure or function.

- 7.5.8 Effects assessed as moderate or major are considered likely to represent significant effects in the context of the EIA Regulations, although professional judgement will be applied on a case-by-case basis.
- 7.5.9 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged in the EIAR.

Supplementary Assessment

- 7.5.10 A Habitats Regulations Appraisal (HRA) will be undertaken to assess the potential for the Proposed Development to result in Likely Significant Effects (LSE) on European sites.
- 7.5.11 The HRA will comprise Stage 1 Screening for Likely Significant Effects and, where required, Stage 2 Appropriate Assessment (AA), in accordance with the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).
- 7.5.12 The HRA will consider potential effects on European designated sites, including Special Protection Areas (SPAs) and Ramsar sites, where ecological connectivity with the Proposed Development is identified.

- 7.5.13 The assessment will include (but is not limited to) consideration of potential impact pathways including disturbance and displacement, impacts to areas that support SPA and Ramsar features, habitat loss or modification, and in-combination effects with other plans and projects.
- 7.5.14 Engagement with NatureScot will be undertaken to agree the scope and methodology of the HRA, where appropriate.
- 7.5.15 The HRA will be informed by desk study information, consultation responses and ongoing ecological and ornithological survey work and will be submitted alongside the EIAR as part of the planning application process.

Cumulative Assessment

- 7.5.16 The approach to assessing in-combination effects from the interrelationship between different environmental effects of the Proposed Development (intra-project) and cumulative effects from the interrelationship between different projects along with the Proposed Development (inter-project) is set-out in **Chapter 3 EIA Process and Methodology**.
- 7.5.17 The interaction and combination of different environmental discipline residual (post-additional mitigation) effects from within the Proposed Development affecting a single feature will be assessed within the Cumulative and In-Combination Effects of the EIAR.
- 7.5.18 The ornithology assessment will consider cumulative effects arising from other relevant developments within the study area where these have the potential to affect the same ornithological features as the Proposed Development.
- 7.5.19 A cumulative assessment search area of up to 20km may be applied where relevant to identified ornithological features.

7.6 Potential Significant Effects

- 7.6.1 The following potential significant effects associated with each phase of the Proposed Development will be assessed and reported within the EIAR.

Construction and Decommissioning

- 7.6.2 The construction and decommissioning phases of the Proposed Development, including Potential Additional Options and Indicative Cable Route Corridors, are expected to give rise to similar types of effects, as both phases will involve temporary activities such as vegetation clearance, vehicle movements, and the use of plant and machinery. As such, these phases are considered collectively for the purposes of this EIASR assessment.
- 7.6.3 The following potential construction and decommissioning phase impacts on IOFs have been identified, based on the nature of the Proposed Development and the baseline conditions described above. These impacts are primarily associated with habitat loss, displacement, disturbance and changes in land-use and landscape within and surrounded by the Proposed Development.
- 7.6.4 Potential impacts during construction and decommissioning phase may include the following pathways (but are not limited to):

- Disturbance (audible and visual stimuli) and displacement: A temporary impact arising from construction activities including operating plant, vehicles and personnel;
- Indirect effects on functionally linked land (if present): Disturbance effects may extend to any areas utilised by SPA and/or Ramsar qualifying species associated with the Firth of Tay and Eden Estuary SPA and Ramsar site.
- Habitat and/or land loss (that supports qualifying features) and modification: Temporary and/or long-term loss and/or modification of agricultural habitats used by ground-nesting birds and foraging waders/wildfowl;
- Disturbance to breeding birds: Risk of disturbance to nesting birds, including Schedule 1 species and SPA qualifying features of Firth of Tay and Eden Estuary SPA and Ramsar site, during the breeding season, which could result in nest abandonment or reduced breeding success; and
- Cumulative effects, where disturbance, displacement, or habitat loss may interact with other proposed or existing renewable developments in the surrounding area, leading to additive or synergistic impacts on shared bird populations. A cumulative assessment will consider consented, submitted and reasonably foreseeable developments within the Zone of Influence.

7.6.5 Direct impacts on the Firth of Tay and Eden Estuary SPA and Ramsar site are not anticipated. However, the potential for direct impacts to land used by qualifying species of these sites cannot be discounted.

7.6.6 In the absence of a complete baseline of Site utilisation by SPA/Ramsar qualifying species, effects on designated site features via areas that support qualifying features are considered likely and will be further assessed in detail within the EIAR and HRA stages. This represents a precautionary approach pending confirmation through field surveys and quantitative assessment of species usage relative to designated site populations.

7.6.7 Decommissioning phase activities are anticipated to be shorter in duration and lower in intensity, which are likely to result in similar and/or reduced effects. However, should additional mitigation be implemented as a result of the assessment for the Proposed Development, such as habitat uplifts, then these will also be considered as part of the decommissioning phase.

Operation and Maintenance

7.6.8 During the operational phase, the Proposed Development, including Potential Additional Options and Indicative Cable Route Corridors, has the potential to result in both adverse and beneficial effects on IOFs. These effects will be largely associated with the presence of long-term, above-the-ground infrastructure, changes in landscape and management and periodic maintenance and replacement activities (but not limited to).

7.6.9 Potential adverse effects during the operational phase may include:

- Disturbance and displacement from maintenance and replacement activities (e.g. major campaign replacement, plant, vehicle and personnel presence) which may result in

temporary displacement of IOFs, particularly ground-nesting birds, nesting Schedule 1 birds and SPA and Ramsar species;

- Habitat and/or FLL loss and modification from long-term change in land use from arable to PV infrastructure;
- Barrier effects and habitat fragmentation via the presence of PV infrastructure within the Site;
- Indirect effects on FLL (if present) if the Site is used by SPA and Ramsar qualifying features;
- Glint and Glare effects arising from PV panels may create reflective surfaces, which could potentially influence bird behaviour (e.g. lake effect), although the evidence for significant effects is limited;
- Cumulative effects, where disturbance, displacement, or habitat loss may interact with other proposed or existing renewable developments in the surrounding area, leading to additive or synergistic impacts on shared bird populations; and
- Habitat loss, fragmentation or change as a result of the delivery and installation of Proposed Development infrastructure.

7.6.10 Potential beneficial impacts during the operational phase may include:

- Habitat(s) management and enhancement(s) through the creation of managed botanically diverse grassland and reduced agricultural intensification will likely enhance foraging and breeding opportunities;
- Reduced disturbance compared to the existing agricultural practices across the Site;
- Reduction of chemical use across the landscape;
- Potential of extension of support for non-breeding and breeding birds via managed grasslands and habitats dependent on habitat quality and management;
- Indirect benefits of solar farms, which have been evidenced to increase fauna and flora, particularly in relation to breeding bird species; and
- Retention and enhancement of hedgerows, providing valuable habitat for boundary-associated species, particularly passerines, and supporting nesting, foraging, and sheltering opportunities.

7.6.11 The above potential beneficial effects are contingent on the delivery of a detailed LEMP for the Proposed Development.

7.7 Approach to Mitigation

7.7.1 Retained areas within the Site boundary may be utilised as part of the mitigation strategy, with management during the operational phase tailored to the ornithological and ecological

requirements for breeding and non-breeding birds, to avoid adverse impacts on land which supports qualifying features, breeding bird habitats and to secure habitat retention, enhancement and uplift.

- 7.7.2 If the assessment predicts a significant effect on an IOF, additional mitigation measures that would be implemented will be presented in the EIAR, and a further assessment undertaken to assess significance of residual effects on the IOF after the implementation of the additional mitigation.

7.8 Matters Scoped Out

Inner Tay Estuary SSSI

- 7.8.1 The Inner Tay Estuary SSSI overlaps significantly with the Firth of Tay and Eden Estuary SPA and Ramsar designation, with many of the SSSI qualifying bird species also forming part of the SPA/Ramsar qualifying interests. However, the SSSI supports additional species, including water rail and bearded tit, which are primarily associated with reedbed habitats.
- 7.8.2 The Proposed Development incorporates a minimum 50m buffer from the SPA/Ramsar boundary as per the design considerations, which includes adjacent reedbed habitats associated with the SSSI. No direct land take or habitat loss is proposed within these reedbed areas, and potential indirect effects (including disturbance) are considered unlikely given the separation distance and intervening habitat.
- 7.8.3 Given the separation distance between construction activities and the retained reedbed habitats, and the absence of a direct ecological linkage pathway (e.g. loss of habitat, severance, or direct disturbance effects), adverse effects on the ornithological features of the Inner Tay Estuary SSSI are considered unlikely.
- 7.8.4 On this basis, and in the absence of a likely impact pathway, the Inner Tay Estuary SSSI is scoped out of further detailed ornithological assessment.

Outer Firth of Forth and St. Andrews Bay Complex SPA (Breeding and Non-breeding Seabirds)

- 7.8.5 The Outer Firth of Forth and St Andrews Bay Complex SPA is designated primarily for breeding seabird assemblages and non-breeding marine and coastal waterbird populations.
- 7.8.6 The qualifying species are predominantly marine or coastal in nature and rely on offshore foraging habitats, with limited reliance on inland terrestrial habitats such as those present within the Site, which comprises lowland agricultural land.
- 7.8.7 However, several qualifying gull species exhibit opportunistic foraging behaviour and may utilise inland agricultural land. On this basis, the SPA is scoped in for gull species only for further assessment. These include herring gull, black-headed gull, common gull and little gull. All other qualifying seabird and waterbird species are scoped out of further assessment on the basis of no credible impact pathway between the Proposed Development and their ecological requirements.

South Tayside Goose Roosts SPA and Ramsar

- 7.8.8 The South Tayside Goose Roosts SPA and Ramsar supports qualifying populations of greylag goose and pink-footed goose, which also form part of the qualifying interests of the Firth of Tay and Eden Estuary SPA and Ramsar.
- 7.8.9 Given the significant overlap in qualifying species and the spatial separation between the Site and the designated areas, the potential effects on goose species will be considered as part of the assessment of the Firth of Tay and Eden Estuary SPA and Ramsar.
- 7.8.10 Furthermore, information obtained from Mitchell (2012⁴⁴) notes that the foraging and roosting areas within and surrounding the SPA are shrinking and support populations from Dupplin Loch (SPA: NO0320), Carsebreck/Rhynd Loch (SPA: NN8710) and Drummond Pond (SPA: NN8518), as such there are no crossovers of populations between South Tayside and Firth of Tay and Eden Estuary SPA and Ramsar.
- 7.8.11 On this basis, South Tayside Goose Roosts SPA and Ramsar is scoped out.

Non-ground Nesting Birds

- 7.8.12 The Site supports a range of common and widespread passerine species associated with hedgerows, field margins and woodland edges. These species are generally of local ecological importance only and are not qualifying features of any designated site.
- 7.8.13 Given the design consideration measures (retention of hedgerow and woodlands and appropriate buffers), it is considered that construction and operational phase impacts are likely to be limited to species associated with agricultural land, including ground-nesting birds and breeding waders and wildfowl.
- 7.8.14 Non-ground nesting bird species (passerines and boundary thriving species), which are not designated features, Schedule 1 species, or otherwise are generally considered less sensitive to the impacts associated with this type of development and are unlikely to be significantly affected by the Proposed Development.
- 7.8.15 Evidence from the Solar Energy UK⁴⁵ and emerging studies⁴⁶ indicates that solar farms in the UK support increased abundance and diversity through the retention and management of boundary habitats and the creation of botanically diverse grassland.

⁴⁴ Mitchell, C. (2012) Mapping the distribution of feeding Pink-footed and Iceland Greylag geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report. Slimbridge: Wildfowl & Wetlands Trust. Available at: https://www.bto.org/sites/default/files/mitchel_2012_mapping_distribution_feeding_pinkfooted_and_greylag_geese_scotland_wwtsnh_report.pdf (Accessed: 8 May 2026)

⁴⁵ Copping, J. P., Waite, C. E., Balmford, A., Bradbury, R. B., Field, R. H., Morris, I., & Finch, T. (2025). Solar farm management influences breeding bird responses in an arable-dominated landscape. *Bird Study*, 72(3), 217–222. <https://doi.org/10.1080/00063657.2025.2450392>

⁴⁶ Solar Energy UK (n.d.) Solar farms and songbirds: could skylarks benefit from ground mounted solar? Available at: <https://solarenergyuk.org/solar-farms-and-songbirds-could-skylarks-benefit-from-ground-mounted-solar/> (Accessed: 28 May 2026).

- 7.8.16 On this basis and given the limited pathways for adverse significant effects, non-ground nesting bird species (excluding Schedule 1 birds) are considered unlikely to be significantly affected by the Proposed Development. This conclusion is further supported by the implementation of the design consideration measures, including distances from boundary features.
- 7.8.17 Conversely, they are likely to experience beneficial effects as a result of the Proposed Development. Accordingly, this group is scoped out of detailed assessment.

7.9 Questions to Consultees

- Do consultees have any expectations on the level of evidence required at the EIAR stage to demonstrate connectivity with SPA/Ramsar sites, particularly where use by qualifying species is intermittent or below standard WeBS thresholds?
- Do consultees have any specific expectations on the treatment of widespread or non-designated bird assemblages (e.g. passerines), where design consideration are proposed and significant effects are not anticipated?
- Do consultees agree with the methodology undertaken and what is proposed?
- Can the consultees provide the expectations of the spatial extent and types of developments that should be included within cumulative ornithological assessments for the Proposed Development, particularly in areas with multiple proposed schemes?
- Are the consultees aware of any expectation for detailed assessment of glint and glare effects on bird features, or is a qualitative assessment generally considered sufficient where evidence of significant effects is limited?

7.10 References and Guidance

- CIEEM (2018, revised in 2024). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.
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- Scottish Government (2022) Scottish biodiversity strategy to 2045: tackling the nature emergency in Scotland. Edinburgh: Scottish Government. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2022/12/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/scottish-bi>
- Scottish Natural Heritage (2016) Assessing connectivity with Special Protection Areas (SPAs): guidance (Version 3 – June 2016). Available at: <https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf>
- Solar Energy UK (n.d.) Solar farms and songbirds: could skylarks benefit from ground mounted solar? Available at: <https://solarenergyuk.org/solar-farms-and-songbirds-could-sky-larks-benefit-from-ground-mounted-solar/>

8 ARBORICULTURE

8.1 Introduction

- 8.1.1 This chapter provides consideration of the potential significant effects of the Proposed Development on the environment with respect to arboriculture. It provides a summary of baseline arboriculture information identified to date, and the further baseline data that will be collected to inform the assessment of the impacts and likely significant effects of the Proposed Development. The chapter outlines the proposed approach for assessing potential effects on arboriculture as a result of the Proposed Development.

8.2 Legislation Policy and Guidance

Legislation

Tree Preservation Orders and Conservation Areas.

- 8.2.1 Local Planning Authorities (LPAs) in Scotland have the power to preserve selected trees and woodlands through the making of Tree Preservation Orders (TPOs). Similarly, special provision is provided to trees located within Conservation Areas (CAs) which are not the subject of a TPO. The LPAs powers to do this are provided by the following Acts and regulations:
- The Town and Country Planning (Scotland) Act 1997 as amended by the 2006 Act;
 - The Planning etc. (Scotland) Act 2006; and
 - The Town and Country Planning (Tree Preservation Order and Trees in Conservation Areas) (Scotland) Regulations 2010 (SSI 2010/434).
- 8.2.2 The principal effect of a TPO is to prohibit the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of trees without first obtaining the consent of the relevant LPA.
- 8.2.3 Where works to trees within a CA are proposed, six weeks notification (Section 211 notice) must first be given to the relevant LPA.
- 8.2.4 Unauthorised works to trees either protected by a TPO or those that are located within a CA, could result in a fine not exceeding £20,000 on conviction of indictment.

Policy

- 8.2.5 Perth and Kinross Local Development Plan 2, Adopted 29th Nov 2019.

Guidance

- 8.2.6 BS5837:2012 Trees in relation to design, demolition and construction – Recommendations is the generally accepted reference document for the submission of tree related data into the planning system in Scotland.

- 8.2.7 Perth and Kinross Council's Adopted Forest and Woodland Strategy 2014 – 2024 (Adopted March 2020). This document is currently under review in 2026.

8.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 8.3.1 Trees, groups of trees, hedgerows and woodlands are visible on aerial imagery throughout the Site. The Site does not include any recorded locations of ancient trees, veteran trees or ancient woodland, however the extent of any ancient woodland buffers will be considered within the tree constraints plan. This also applies to Megginch Castle, and its associated Garden and Designed Landscape, however any such trees will be recorded when surveys are undertaken. This also applies to the Potential Additional Options and Indicative Underground Cable Route Corridors.

Potential Sources of Impact

- 8.3.2 The construction phase of the Proposed Development, including the areas identified as a Potential Additional Option Area or Indicative Underground Cable Route Corridor, could cause an impact to the above ground, crown and trunk, and below ground, roots and rooting area of arboricultural features.

Design Considerations

- 8.3.3 The design iteration process of the Proposed Development (including areas identified as a Potential Additional Option Area or Indicative Underground Cable Route Corridor) will consider the Site's existing arboricultural resource and seek to reduce any impact to trees, groups of trees, hedgerows and woodlands on and adjacent to the Site. This will be achieved by the use of buffers around field boundaries and existing arboricultural features. The design will look to use existing field accesses where possible to minimise the loss of trees, groups of trees and hedgerows. Furthermore, working alongside the Ecologist and Landscape Architect, consideration will be given during the design iteration process to provide enhancement opportunities to improve biodiversity through additional tree planting, strengthening green network links and infilling hedgerows.

8.4 Consultation

- 8.4.1 Information relating to individual trees, groups of trees and woodland is publicly available. Forestry and Land Scotland hold data relating to any identified ancient woodland which is situated on land that they currently manage.
- 8.4.2 It is anticipated that the removal of woodland will be avoided through design iteration measures, thereby ensuring consultation with Scottish Forestry is not necessary. However, if in the final design, limited areas of woodland removal cannot be avoided, then Scottish Forestry will be consulted.

8.5 Survey and Assessment Methodology

- 8.5.1 The tree survey will be undertaken by a qualified and experienced arboricultural consultant in accordance with BS5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837:2012).

Surveys

- 8.5.2 A BS5837:2012 survey of all trees will be undertaken. This survey will consider all trees with a stem diameter over 75mm that are within and up to 15m of the Site. Dependent on their setting, as identified through the survey, the trees will be recorded as either individual trees, groups of trees, hedgerows and/or woodlands.
- 8.5.3 The presence of ancient and veteran trees will impact the available development area. The presence of such features will be assessed during the Site tree survey.
- 8.5.4 The presence of Tree Preservation Orders and Conservation Areas will be reviewed when the survey is completed.

Assessment Methodology

Tree Survey

- 8.5.5 The tree survey will be completed on-site as per the methodology referenced in **Paragraph 8.5.1**.

Arboricultural Impact Advice

- 8.5.6 Once the tree survey data has been reviewed, it will inform the design iteration process up to a fixed design (Design Freeze).

Arboricultural Impact Assessment Report

- 8.5.7 Once the frozen design is confirmed, ADAS will prepare an Arboricultural Impact Assessment Report (AIAR). This assessment will evaluate the direct and indirect effects of the Proposed Development and, where necessary, will also recommend appropriate mitigation. In addition to the evaluation of the extent of the impact on existing trees, the AIAR will be accompanied by the initial Tree Survey Schedule, Tree Constraints Plans, and subsequent Arboricultural Impact Assessment Plan(s) (AIAP). The AIAPs will also include annotations at locations of potential impacts outlining the impacts and proposed mitigation.

Sensitivity

Table 8.1: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High	Ancient and veteran trees, ancient woodland
Medium	Category A and B trees
Low	Category C trees
Negligible	Category U trees

Magnitude of Impact

Table 8.2: Magnitude of Impact Criteria

Sensitivity of Receptor	Criteria
High	Loss of trees
Medium	Detriment to tree growth
Low	Short term detriment to growth
Negligible	No impact

Significance of Effect

Table 8.3: Sensitivity of Receptor Criteria

	Magnitude of Impact			
Sensitivity of Receptor	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Cumulative Assessment

- 8.5.8 Potential cumulative effects for arboriculture will be considered where identified; however, currently there are no other construction projects that require a cumulative assessment with the Proposed Development.

8.6 Potential Significant Effects

- 8.6.1 Potential significant effects arising from the Proposed Development may include:

- Impact on Root Protection Areas (RPAs) of retained trees and loss or negative impact on retained trees; and.
- Loss of trees, groups of trees, hedgerows and woodlands.

Assessing Potential Significant Effects from the Potential Additional Option Areas and Indicative Cable Route Corridors

- 8.6.2 There is no change to the assessment required by including the Potential Additional Option areas and Indicative Cable Route Corridors. However, the potential impact of a cable route within the ancient woodland buffer, as described above in **Paragraph 8.3.2**, will need to be assessed on-site during the tree survey.

8.7 Approach to Mitigation

- 8.7.1 Once the tree survey data is complete and any ancient and veteran trees have been identified, the Tree Constraints Plan (TCP) will be produced. The constraints will be addresses in the design iteration process, to seek to mitigate any potential impacts to the Site's arboricultural features through design.

8.8 Matters Scoped Out

- 8.8.1 Arboricultural effects are being considered at an early stage of the Proposed Development's design. Mitigation Measures (as outlined in **Section 8.7** above) are proposed to avoid potential impacts through the design iteration process.
- 8.8.2 The Proposed Development will be designed to avoid areas of significant tree cover and to minimise the potential for loss or damage to existing trees and woodland where practicable. Where interactions with existing vegetation cannot be entirely avoided, standard good practice mitigation measures will be implemented, including the establishment of tree protection zones and including tree root protection areas, and adherence to British Standard 5837:2012 Trees in relation to design, demolition and construction, Recommendations BS5837:2012, and the implementation of appropriate construction practices to prevent root compaction and direct effects.
- 8.8.3 Based upon the ability to address potential significant effects through the design iteration process, no significant environmental effects on arboricultural receptors are anticipated. It is proposed to scope out arboriculture from the EIAR and will be covered in a standalone Arboriculture Report.

8.9 Questions to Consultees

- Can consultees confirm the proposed methodology for arboriculture survey work is acceptable?
- Are there any cumulative developments that consultees recommend should be considered for this proposal?
- Are there any consultees, other than those listed, that should be specifically consulted on the impacts of arboriculture for the Site?
- Can you confirm that Arboriculture can be scoped out?

8.10 References and Guidance

- BS5837:2012 Trees in relation to design, demolition and construction – Recommendations.
- Raven 2 Recognition of Ancient, Veteran and Notable Trees (RAVEN) methodology published by Julian Forbes-Laird 2023.

- Forestry Commission Information Note 'Estimating the Age of Large and Veteran Trees in Britain' authored by John White.
- Reference to the chart of girth in relation to age and developmental classification of trees contained as Figure 1.3 in the Ancient Tree Forum publication "Ancient and other veteran trees: further guidance on management" edited by David Lonsdale for the identification of Ancient, Veteran and notable trees.
- NatureScot Ancient Woodland Inventory. Interactive mapping for the identification of ancient, long-established and semi natural woodland.
<https://opendata.nature.scot/datasets>
- Woodland Trust's Ancient Tree Inventory mapping for the location of identified ancient, veteran and notable trees.
- Perth and Kinross interactive mapping for Tree Preservation Orders and Conservation Areas, Local Development Plan and Supplementary guidance.

9 SOILS, GEOLOGY AND WATER INCLUDING FLOOD RISK

9.1 Introduction

- 9.1.1 This chapter outlines the proposed scope of the Environmental Impact Assessment Report (EIAR) to assess the potential significant effects from the Proposed Development on soils, geology, and the water environment (including hydrology, and hydrogeology) and flood risk.

9.2 Legislation Policy and Guidance

Legislation

- 9.2.1 The assessment will be undertaken in line with current legislation, including but not limited to:

- European Union (EU) Water Framework Directive (2000/60/EC);
- EU Drinking Water Directive (98/83/EC);
- The Environment Act 1995;
- Environmental Protection Act 1990;
- The Flood Risk Management (Scotland) Act 2009;
- Water Environment and Water Services (Scotland) Act 2003;
- Environmental Authorisation (Scotland) Regulations 2018 (EASR);
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017;
- The Water Supply (Water Quality) (Scotland) Regulations, 2001; and
- Private Water Supplies (Scotland) Regulations 2006.

Policy

- 9.2.2 The assessment will be undertaken in line with planning policy, including but not limited to:
- National Planning Policy Framework 4 (NPF4) adopted by Scottish Government on 13 February 2023. Specifically, Policy 2 (Climate Mitigation and Adaptation), Policy 5 (Soils), Policy 20 (Blue and Green Infrastructure), and Policy 22 (Flood Risk and Water Management); and
 - The Perth and Kinross Local Development Plan 2 (PKLDP2) adopted on 29 November 2019. Specifically, Policy 33 (Renewable and Low Carbon Energy), Policy 38

(Environment and Conservation), Policy 42 (Green Infrastructure), Policy 50 (Prime Agricultural Land), Policy 51 (Soils), Policy 52 (New Development and Flooding), Policy 53 (Water Environment and Drainage), and Policy 58 (Contaminated Land and Unstable Land).

Guidance

9.2.3 The assessment will be undertaken in line with current guidance, including but not limited to:

- Planning Advice Notes (PANs) published by the Scottish Government;
- Guidance documents published by Perth and Kinross Council (PKC);
- Scottish Environment Protection Agency (SEPA) and NetRegs Guidance for Pollution Prevention (GPP);
- Construction Industry Research and Information Association (CIRIA) publications; and
- SEPA Publications.

9.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

Bedrock Geology

- 9.3.1 British Geological Survey (BGS) Onshore GeoIndex mapping indicates that the majority of the Site including the Potential Additional Options and Indicative Underground Cable Route Corridors are underlain by the Glenvale Sandstone Formation, comprising sandstone bedrock deposits. A smaller area within the southwestern extent of the Site is underlain by the Ballagan Formation, comprising interbedded mudstone and siltstone deposits.
- 9.3.2 No significant structural geological features, mining activities or recorded mine entries are identified within the Site area. The Site is not located within a Coal Mining Reporting Area.

Superficial Geology

- 9.3.3 BGS Onshore GeoIndex mapping indicates that the majority of the Site including the Potential Additional Options and Indicative Underground Cable Route Corridors are underlain by Raised Tidal Flat Deposits of Holocene age, comprising predominantly silt and clay. Central areas of the Site are recorded to be underlain by a mixture of Raised Marine Deposits comprising clay, silt, sand and gravel together with Glacial Till deposits. A smaller area within the northwestern extent of the Site is underlain by Glaciofluvial Ice Contact Deposits comprising gravel, sand, and silt.
- 9.3.4 The low-lying southern areas of the Site, near to the Upper Tay Estuary and associated drainage channels, are anticipated to be characterised by softer and potentially compressible superficial deposits associated with estuarine and marine depositional environments. Historical mapping also identifies very localised areas of historically poorly drained or marshy ground conditions which often indicate the presence of silts and clays.

- 9.3.5 BGS mapping indicates that no significant areas of artificial ground are recorded across the Site. However, localised made ground may be present in association with existing farm buildings, tracks, and agricultural infrastructure, particularly within the northeastern parcel of the Site.
- 9.3.6 Review of historical mapping indicates that the Site has remained predominantly agricultural and undeveloped since at least the late 19th century, with no significant potentially contaminative land uses identified. Historical features identified within the Site include isolated agricultural infrastructure and features such as a former tank, a saw mill, and areas of historically poorly drained ground; however, these are not considered likely to represent significant widespread contamination sources.
- 9.3.7 The surrounding area is also predominantly rural and agricultural in character, with nearby settlements including Inchtute, Kinnaird and Errol. Historical sand and gravel quarries are recorded to the northwest near Kinnaird, although no quarrying activity is recorded within the Site boundary.
- 9.3.8 Based on the available desk study information, the potential for significant contamination beneath the Site is considered low. Potential contaminant sources are anticipated to be limited to routine agricultural activities, including the use and storage of fuels, oils, fertilisers, herbicides, and pesticides, together with any localised impacts associated with existing farm infrastructure or historical agricultural features.

Soils and Peat

- 9.3.9 National soil mapping for Scotland indicates that the majority of the Site including the Potential Additional Options and Indicative Underground Cable Route Corridors are underlain by noncalcerous gleys. A localised area of brown earth soils is recorded in the central Site area, and areas to the northwest and to the south, associated with upper terrace and raised beach deposits, mainly sands and gravels.
- 9.3.10 Peatland classification mapping indicates that the whole Site is located with an area of Class 0 peatland, where no peat is present.

Land Capability for Agriculture

- 9.3.11 The Land Capability for Agriculture (LCA) classification is a Scottish-based system designed to illustrate the potential productivity and cropping flexibility of land. It is based on an integrated consideration of the physical limitations that climate, soil, and site factors impose upon agricultural systems and practices. The classification is described in detail in the LCA Monograph of Bibby et al, (1991) and is recognized by the Scottish Government and Planning Authorities as the official system of land classification in Scotland (Scottish Development Department, 1987). The Scottish Government has a long-standing commitment implemented through the planning process to protect the best quality land from development and retaining its capacity for food production. 'Prime Agricultural Land' is defined by the Scottish Government as LCA Classes 1, 2 and Class 3 Division 1 (Scottish Executive, 2001) and this protection is incorporated in the Land Use Strategy (Scotland's Environment, 2014) and National Planning Framework 4 (Scottish Government, 2023). These documents are complex, and it must be stated that it is not always possible to elucidate a single LCA class for even small parcels of land due to the inherent spatial variability of many of the soils of Scotland.

- 9.3.12 The current classification of the Site as shown in **Figure 9.1** confirms that the Site comprises a mixture of:
- LCA 2: Land capable of producing a wide range of crops.
 - LCA 3.1: Land capable of producing consistently high yields of a narrow range of crops and/ or moderate yields of a wider range. Short grass leys are common; and
 - LCA 3.2: Land capable of average production though high yields of barley, oats and grass can be obtained. Grass leys are common.

9.3.13 The classification above is based upon soil surveys undertaken in 1991.

Hydrogeology

9.3.14 The bedrock beneath the Site including the Potential Additional Options and Indicative Underground Cable Route Corridors have been classified by the BGS as a moderately productive aquifer with potential for significant intergranular flow beneath most of the Site, owing to the presence of permeable sandstone, partly pebbly with subordinate siltstone and mudstone. The Ballagan Formation bedrock in the south of the Site is classified as a multi-layer aquifer with fracture groundwater storage and flow.

9.3.15 All of Scotland's groundwater bodies have been designated as a Drinking Water Protected Area (DWPA). The Site is located upon the Dundee groundwater body (SEPA ID: 150624) and the Carse Costal groundwater body (SEPA ID: 150796), which are both monitored under Cycle 3 of the Water Framework Directive (WFD), with a current (2024) overall status of 'Poor', due to poor chemical status and water quality. The poor status may reflect the use and application of fertilisers associated with agricultural activities.

Groundwater Dependent Terrestrial Ecosystems

9.3.16 Due to the modified and current agricultural and grazing use of the Site, it is unlikely that groundwater dependent terrestrial ecosystems (GWDTE) will be present. However, as discussed in **Chapter 6: Ecology**, if wetland habitats are considered likely to be crossed by the Proposed Development a National Vegetation Classification (NVC) survey will be conducted and will be used to identify areas of potential GWDTE. Where potential GWDTE are identified, they will be assessed in line with the latest SEPA guidance.

Hydrology

- 9.3.17 The local hydrology is shown on **Figure 9.2**. The Site, including the Potential Additional Options and Indicative Underground Cable Route Corridors, is located within the Dundee Coastal Catchment, with all watercourses on the Site draining in a southerly direction towards the Upper Tay Estuary. The Site is drained by the followed nested surface water catchments:
- Errol Pow to the west, which discharges directly into the Upper Tay Estuary to the southwest of the study area;
 - Grange Pow across the centre of the Site, which accepts flows from Kilspindie Burn, Rait Burn and Craig Burn to the north, draining in a southeasterly direction, before outfalling into the Upper Tay Estuary via Powgavie Burn;

- Valley Pow (Craig Burn) to the north, which drains the northern area of the Site and is a tributary of Grange Pow; and
- Bogmill Pow, which drains the eastern area of the Site, accepting flows from Inchmartine Pow and Erskine Pow to the north. Bogmill Pow drains in a southerly direction and discharges into the Upper Tay Estuary via Powgavie Burn.

9.3.18 None of the catchments which drain the Site have been designated as a DWPA.

9.3.19 A Pow is typically a Middle Age man-made drain developed to improve the drainage of surrounding soils. Often smaller and shallower field perimeter drains and buried drains discharge to adjacent Pows.

9.3.20 Grange Pow (SEPA ID: 6402) and Errol Pow (SEPA ID: 6401) are both monitored under Cycle 3 of the WFD and are designated as heavily modified waterbodies with a current (2024) overall status of 'Moderate Ecological Potential'.

9.3.21 The Upper Tay Estuary is a transitional waterbody (SEPA ID: 200439) monitored under Cycle 3 of the WFD, which has a current (2024) overall classification of 'Good'.

Flood Risk

9.3.22 SEPA flood mapping indicates that the Site, including the Potential Additional Options and Indicative Underground Cable Route Corridors, is not at risk from coastal flooding. Land immediately to the south of the Site, near Errol, is shown to be at increased risk of coastal flooding both now and in the future.

9.3.23 Large areas are shown to be at risk of flooding from fluvial sources both now and in the future. Predicted flood depths for the future medium likelihood fluvial flood event are shown on **Figure 9.3a**. Generally, flood depths across the southern area of the Site are less than 0.3m, except for along mapped watercourse corridors. Across the northern areas of the Site flood depths are shown to be between 0.3m and 1m. Generally, fluvial flood depths are not shown to exceed 1m.

9.3.24 Similarly, large areas of the Site, especially to the north, are shown to be at risk of flooding from surface water and small watercourses, both now and in the future. Predicted flood depths of the future surface water and small watercourses medium likelihood flood event are shown on **Figure 9.3b**. Generally, flood depths are predicted to be shallow (less than 0.3m deep). However, a surface water flood flow path, with depths between 0.3m and 1m, is shown to be present across the northern area of the Site.

Water Abstractions

9.3.25 There are two water abstractions authorised by SEPA under the EASR; one from Inchmartine Pow to the north of the Site for Millhouse Hydropower Scheme, and a second from Bogmill Pow to the east of the Site for water resources for an undefined micro activity. These abstractions are shown on **Figure 9.2**.

9.3.26 Details of registered Private Water Supplies (PWS) will be obtained from PKC as part of the EIA phase of the Proposed Development and verified as part of the field survey. Details of any Scottish Water infrastructure will also be obtained.

Designated Sites

- 9.3.27 Review of NatureScot's SiteLink website indicates that the following registered or designated sites are within 500m of the Site:
- Inchcoonans Geological Conservation Review (GCR) site and Inchcoonans Claypit Special Site of Scientific Interest (SSSI) which is located within the southwestern extent of the study area. This GCR and SSSI is located approximately 113m from the Site boundary at its closest point and is designated for its Quaternary deposits; a sequence of fossil-bearing marine sediments deposited during the waning of the last major ice sheet to cover the country.
 - The Firth of Tay and Eden Estuary Ramsar, Special Area of Conservation (SAC) and Special Protection Area (SPA), which is underpinned by the Inner Tay Estuary SSSI. The Inner Tay Estuary SSSI is designated for its non-breeding and breeding birds, saltmarsh coastlands, and transition saltmarsh fens. The Inner Tay Estuary SSSI is hydraulically connected to the Site, located immediately adjacent to the southern boundary of the Site at its closest point.

Potential Sources of Impact

- 9.3.28 Without mitigation or adherence to best practice, impacts on geology, soils, and the water environment could occur during the construction phase, operational phase and decommissioning phase of the Proposed Development, including the Potential Additional Options and Indicative Underground Cable Route Corridors. A summary of the potential sources of impact of relevance to geology, soils and the water environment is provided below. These will be considered in the EIAR. Decommissioning effects will be similar to potential construction effects (but on a smaller scale).

Potential Sources of Impact During the Construction Phase:

- Excavations and use of cement products for the installation of fence posts and formation of platforms, and foundations;
- Vegetation removal, soil compaction from vehicle movements, and use of machinery for the installation of solar panels;
- Soil stripping, vegetation removal, placement of aggregate, use of machinery, and use of cement bound sand for the construction of access tracks and Underground Cable Route Corridor;
- Construction of road and/or pedestrian watercourse crossings, construction of launch and landing pads for horizontal direction drilling (HDD) and loss of drilling muds, trenched excavations, and use of machinery for the installation of required watercourse crossings and/or upgrade of existing watercourse crossings;
- Vegetation removal, construction of foundations and associated dewatering, use of machinery, general earthworks, and the use of concrete or equivalent for the installation of the Battery Energy Storage System (BESS), substation, inverters, transformers, and other ancillary infrastructure; and

- Abstractions from groundwater and/or surface water to support construction activities.

Potential Sources of Impact During the Operational Phase:

- Use of motorised vehicles for maintenance works;
- Excavations or earthworks required for maintenance works or replacement of individual energy storage units at the BESS (if required);
- Presence of additional impermeable surfaces associated with the BESS, substation, inverters, transformers, and other ancillary infrastructure;
- Battery acid containment system and firewater containment system associated with the BESS; and
- Abstractions from groundwater and/or surface water to support maintenance activities.

Design Considerations

9.3.29 Design considerations relevant to geology, soils and the water environment are likely to include:

- Existing access tracks and watercourse crossings will be utilised as part of the Proposed Development where technically possible;
- Where excavations are deeper than 1m, a buffer of 50m will be applied to watercourses and waterbodies shown on 1:10,000 scale mapping. Where this cannot be maintained – for example for technical or safety reasons, additional survey work may be completed and/or additional mitigation measures specified;
- Where excavations are shallower than 1m or where the only ground intrusions would comprise of piling to establish solar photovoltaic (PV) arrays, either a 10m, 15m, or 30m buffer will be applied to watercourses or waterbodies shown on 1:10,000 scale mapping, in accordance with the SEPA Recommended Riparian Corridor dataset;
- A sustainable surface water drainage strategy will be implemented for hardstanding areas of the Site, which utilises Sustainable Drainage Systems (SuDS) to provide water quality benefits and control the rates and volumes of surface water runoff from the Proposed Development;
- Provision will be made for fire water control and containment in the unlikely event of a fire at the BESS;
- Impacts on water abstractions, private water supply sources, and areas of GWDTE will be avoided; and
- Deep areas of flooding (>0.3m deep) shown on the SEPA flood maps for up to and including the 1 in 200-year flood event plus an allowance for climate change will be reviewed and avoided where possible.

9.4 Consultation

- 9.4.1 No consultation has been undertaken to inform this chapter of the Environmental Impact Assessment Scoping Report (EIASR). Consultation with relevant stakeholders will be undertaken following the submission of the EIASR and through the design iteration stage up to submission of the Section 36 (S36) consent application, as appropriate.
- 9.4.2 As part of the consultation phase, environmental data and views of the Proposed Development will be sought from:
- PKC;
 - SEPA;
 - NatureScot;
 - Scottish Water; and
 - The Tay Foundation & Fisheries Trust.

9.5 Survey and Assessment Methodology

- 9.5.1 The potential significant effects from the Proposed Development on geology, soils, and the water environment will be assessed by completing a desk study and field investigation followed by an impact assessment, the processes of which are detailed below.
- 9.5.2 The water environment study area will extend 500m from the Site boundary. The study area for soils and geology will be within the Site boundary. The water environment cumulative effects study area will extend to 5km from the Site boundary and include sites of a similar nature and scale in the same water catchments(s) as the Site. The soils and geology cumulative effects study area will extend to 2km from the Site.

Surveys

Desk Study

- 9.5.3 An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to geology, soils, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water supplies, surface water flows, flood extents, depths and velocities, rainfall data, water quality data, and soil data. This will include review of published geological maps, Ordnance Survey maps, aerial photographs, and site-specific data such as digital terrain models (slope plans) and geological literature.
- 9.5.4 The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological, soils, hydrogeological, and hydrological environment.

Field Surveys

- 9.5.5 The hydrological assessment specialists will liaise closely with the project ecology and geology/geotechnical specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.
- 9.5.6 A detailed site visit and walkover survey will be undertaken, to:
- Verify information collected during the desk and baseline study;
 - Identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
 - Visit any GWDTE (in consultation with the project ecologists);
 - Verify flow paths and any areas of flooding identified by SEPA;
 - Obtain private water supply information from PKC and visit any public and private water supplies within the study area that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
 - Prepare a schedule of potential watercourse crossings (where required); and
 - Identify potentially suitable outfall locations for the proposed SuDS strategy.
- 9.5.7 The desk study and field surveys will be used to identify potential development constraints and be used to inform the emerging design of the Proposed Development.
- 9.5.8 Once the desk study is completed and sensitive geological, soil, and water features are confirmed an EIAR will be prepared to assess the potential effects on geology, soils, hydrology, and hydrogeology during all phases of the Proposed Development.

Land Classification Assessment Report

- 9.5.9 The James Hutton Institute has been appointed to prepare a Land Classification Assessment (LCA) report for the Site. The primary aim of the soil survey is to identify and describe different soil types and to record their distribution. Site work will be undertaken and the soil profile established by measuring a vertical section approximately 60cm to 1m deep from the surface of the ground to the soil parent material to study and classify the soils at Site.
- 9.5.10 The system of soil classification to be used in the LCA Report will be based on that of the Soil Survey of Scotland (1984, revised and updated, 2014).
- 9.5.11 The locations of the soil profiles will be located in the field with a hand-held GARMIN 62s GPS. Soil inspection pits will be hand-dug by spade and auger and described as outlined to a depth usually in excess of 70cm and occasionally down to around 100cm. Several features will be recorded, notably depth of the topsoil and subsoil horizons, soil colour, texture, drainage status, and stoniness to determine the LCA classification. In addition, information will also be noted on slope and pattern of topography.
- 9.5.12 The LCA Report will be presented as a standalone technical report and referenced in the EIAR.

Assessment Methodology

- 9.5.13 The purpose of this assessment will be to:
- Assist in the micro-siting of tracks and proposed infrastructure in the least hydrogeologically and hydrologically sensitive areas by applying buffer zones around watercourses, GWDTE and PWS, and other hydrological features;
 - Assist in the micro-siting of water sensitive infrastructure to areas at lower risk of flooding;
 - Determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow, drainage, and flood risk;
 - Assess potential effects on water (including groundwater) dependent habitats;
 - Determine suitable standard mitigation and additional mitigation measures to prevent significant hydrological and hydrogeological effects; and
 - Develop an acceptable code for working on the Site that will adopt best practice procedures, effective management, and control of on-site activities to reduce or offset any detrimental effects on the geological, hydrogeological, soils, and hydrological environment.
- 9.5.14 It is anticipated the EIAR would include the following technical appendices and assessments:
- Phase I Preliminary Land Quality Risk Assessment;
 - Flood Risk Assessment and Drainage Impact Assessment; and
 - Private Water Supply Risk Assessment in accordance with SEPA's guidance, as required.
- 9.5.15 A qualitative risk assessment methodology will be used to assess the significance of the potential effects. Two factors will be considered: the sensitivity of the receiving environment and the potential magnitude should that potential impact occur.
- 9.5.16 This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the Proposed Development. This approach also allows effort to be focused on reducing risk where the greatest benefit may result.
- 9.5.17 The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) and the magnitude of change will each be considered through a set of pre-defined criteria.
- 9.5.18 The sensitivity of the receiving environment (**Table 9.1**) together with the magnitude of change (**Table 9.2**) defines the significance of the effect, which will be categorised into level of significance (**Table 9.3**).

Sensitivity

Table 9.1: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High	- soil type and associated land use is highly sensitive (for example, unmodified blanket bog or peatland, Class 1 or 2 priority peatland habitats, or prime agricultural land); - extensive areas of deep peat >1m deep are recorded; - SEPA WFD water body classification of moderate to high; - receptor is of high ecological importance or of national or international value (for example, Geological Conservation Review sites (GCRs), Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), habitat for protected species) where a designated features are dependent on geological hydrology and/or hydrogeology environment; - extensive areas of flooding are recorded on SEPA's future flood maps and/or water body acts as an active floodplain or flood defence; - development classified as 'most vulnerable and highly vulnerable' use under NPF4; - receptor has been identified as a Potential Vulnerable Area (PVA); - receptor is used for public and/or private water supply (including Drinking Water Protected Areas); - groundwater vulnerability is classified as Class 4 to 5; - groundwater aquifer is considered highly productive aquifer; and - areas of potential GWDTE have been identified and considered to be predominately supported by groundwater.
Medium	- soil type and associated land use moderately sensitive (for example, arable land which is not classified as prime, commercial forestry or modified peatland for example by drainage or forestry or Class 3 and 5 peatland habitats); - areas of peat <1m deep are recorded; - SEPA WFD water body classification of poor to moderate; - isolated areas of flooding are recorded on SEPA's future flood maps which are shallow (<0.3m deep) and / or confined to immediate waterbody corridors; - development classified as 'least vulnerable' use under NPF4;

Sensitivity of Receptor	Criteria
	- groundwater aquifer vulnerability of Class 2 to 3; - groundwater aquifer is considered a moderately productivity aquifer; and - areas of potential GWDTE have been identified and considered to be predominately supported by rainfall and / or surface water.
Low	- soil type and associated land use not sensitive to change in hydrological regime and associated land use (for example, intensive grazing of sheep and cattle or Class 4 and 0 peatland habitats); - no peat deposits are recorded; - SEPA WFD water body classification of poor to bad; - development is not shown to be at risk of flooding on SEPA's future flood maps; - development classified as 'essential infrastructure or water compatible' use under NPF4; - groundwater vulnerability is classified as Class 0 to 1; - groundwater aquifer is not considered a significant aquifer or low to very low productivity; - receptor not used for water supplies (public or private); and - no areas of potential GWDTE have been identified.
Negligible	Receptor would not be affected by the Proposed Development, for example lies within a different and unconnected hydrological / hydrogeological catchment.

Magnitude of Impact

Table 9.2: Magnitude of Impact Criteria

Magnitude	Criteria
High	Results in a loss of attribute Long-term or permanent changes to the baseline geology, hydrology, hydrogeology, and water quality such as: - permanent degradation and total loss of soils, peatland habitat or protected geological features; - loss of important geological structure / features; - wholesale changes to watercourse channel, route, hydrology, or hydrodynamics; - changes to the baseline environment resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns; - major changes to the water chemistry; and

Magnitude	Criteria
	major changes to groundwater levels, flow regime, and risk of groundwater flooding.
Medium	Results in impact on integrity of attribute or loss of part of attribute Material but non-fundamental and short to medium-term changes to the baseline geology, hydrology, hydrogeology, and water quality such as: - loss of extensive areas of soils or peat habitat, damage to important geological structures / features; - some fundamental changes to watercourses, hydrology, or hydrodynamics; - changes to baseline environment resulting in an increase in runoff within system capacity; - moderate changes to erosion and sedimentation patterns; - moderate changes to the water chemistry of surface runoff and groundwater; and - moderate changes to groundwater levels, flow regime, and risk of groundwater flooding.
Low	Results in minor impact on attribute Detectable but non-material and transitory changes to the baseline geology, hydrology, hydrogeology, and water quality such as: - minor or slight loss of soils, peatland, or slight damage to geological structures / features; - minor or slight changes to the watercourse, hydrology, or hydrodynamics; - changes to baseline environment resulting in slight increase in runoff well within the drainage system capacity; - minor changes to erosion and sedimentation patterns; - minor changes to the water chemistry of surface runoff and groundwater; and - minor changes to groundwater levels, flow regime, and risk of groundwater flooding.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use / integrity No perceptible changes to the baseline geology, hydrology, hydrogeology, and water quality such as: - no impact or alteration to existing important soils, peatland, or geological environs; - no alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion, and sedimentation patterns; - no pollution or change in water chemistry to either groundwater or surface water; and

Magnitude	Criteria
	no alteration to groundwater recharge or flow mechanisms.

Significance of Effect

Table 9.3: Sensitivity of Receptor Criteria

	Magnitude of Impact			
Sensitivity of Receptor	High	Medium	Low	Negligible
High	Major	Moderate	Moderate	Negligible
Medium	Moderate	Moderate	Minor	Negligible
Low	Minor	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

- 9.5.19 The level, and therefore significance, of the resultant effect is informed by professional judgement as to the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes. **Table 9.3** is used as a guide to demonstrate the relationship between the sensitivity of the identified receptor and the anticipated magnitude of an impact. Professional judgement is, however, equally important in verifying the suitability of this guiding 'formula' to the assessment of the level of each individual effect.
- 9.5.20 Any effect of 'major' or 'moderate' significance as outlined in **Table 9.3** are considered to be significant in terms of the EIA regulations.

Cumulative Assessment

- 9.5.21 A review of other existing and proposed developments in planning when the EIAR is prepared near the Proposed Development will be undertaken and potential impacts on soils, geology, hydrogeology, hydrology will be assessed to identify cumulative impacts. With regard to the Proposed Development, it is considered that mitigation measures will be proposed that will have a neutral effect or provide betterment compared to baseline conditions. It is not considered that there will be any significant residual impact to report.

9.6 Potential Significant Effects

Geology and Soils (including peat)

- 9.6.1 As outlined in **Section 9.3**, no significant structural geological features, mining activities or recorded mine entries are identified within the Site area. The Site is not located within a Coal Mining Reporting Area. Moreover, the bedrock or superficial geology beneath the Site is common regionally and does not form part of a GCR site.
- 9.6.2 The Site is also shown to be underlain by mineral soils (Class 0 peatland), whereby no peat is present.

- 9.6.3 With respect to these considerations, the Proposed Development is not likely to give rise to any significant effects on geology or peat. They are therefore proposed to be **Scoped Out** of the EIAR. However, a Phase I Preliminary Land Quality Risk Assessment report will be presented as a technical appendix to the EIAR.

Land Capability for Agriculture

- 9.6.4 It is envisaged at this initial stage, that there will not be any significant environmental effects resulting from the Proposed Development including the Potential Additional Options and Indicative Underground Cable Route Corridors on the LCA of the Site. However, the original LCA guidelines in 1991, assume a 'satisfactory level of management', including investment of capital and improvements likely to be economically viable in the foreseeable future. The standard to be adopted should be taken at the level of input and intensity of soil, crop and grassland management applied successfully by farmers within the relevant sector of the farming industry. Such management skill will maintain or improve the physical land resource on a long-term productivity basis.
- 9.6.5 It is accepted that these interpretations are an expression of the knowledge at the time of publication of the original LCA guidelines in 1991, and that revisions may be necessary with new experience, policy changes or technological innovations, of which there have had plenty over the preceding 35 years, but which, with the exception of some climatic revisions, remain unrevised in the LCA process.
- 9.6.6 With respect to these considerations, the Proposed Development, in LCA terms, is a 'land use' issue which will not give rise to significant environmental effects, and which is considered to be a planning matter rather than an EIA issue. It is therefore proposed to be **Scoped Out** of the EIAR, however, will be addressed and discussed within a standalone LCA Report and the findings presented and assessed against policy in the Planning Statement supporting the S36 consent application.

Water Environment

Potential Significant Impacts During the Construction Phase

- 9.6.7 The following potential significant effects during the construction phase will be considered in the EIAR:
- Impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances or discharge of sediment laden runoff to drainage systems and watercourses which could impact the Upper Tay Estuary SSSI and Firth of Tay and Eden Estuary Ramsar, SAC and SPA;
 - Increased flood risk to areas downstream of the Site during construction through increased surface runoff and/or works within the fluvial floodplain;
 - Changes in groundwater levels from dewatering excavations;
 - Potential change of groundwater flow paths and contribution to Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
 - Disturbance of watercourse bed and banks from the construction of watercourse crossings; and

- Potential adverse impacts to licenced and private water supplies if present.

Potential Significant Impacts During the Operational Phase

9.6.8 The following significant effects during the operational phase will be considered in the EIAR:

- Increased runoff rates and flood risk, resulting from the presence of additional hardstanding associated with tracks, BESS, substation and ancillary infrastructure, or the presence of new infrastructure within the floodplain;
- Changes in natural surface water drainage patterns (which may affect water contribution to GWDTE);
- Changes to groundwater levels and groundwater movement from below ground infrastructure;
- Longer term impacts on abstractions for water supplies, particularly any supplies dependent on groundwater; and
- Pollution impacts on surface water quality from maintenance work of BESS firewater runoff, potentially impacting the Upper Tay Estuary SSSI and Firth of Tay and Eden Estuary Ramsar, SAC and SPA.

Potential Significant Impacts During the Decommissioning Phase

9.6.9 Potential decommissioning effects are expected to be the similar to potential construction effects. Decommissioning the Proposed Development will be carried out in accordance with an approved decommissioning plan which will be expected to include the same safeguards as those provided during the construction phase of the Proposed Development which will be outlined in the EIAR. Methods for decommissioning and mitigation measures to be employed at decommissioning stage will follow best practice measures and guidance at that time.

9.7 Approach to Mitigation

- 9.7.1 The Proposed Development will be refined through iterative design processes, evolving in response to constraints identified during baseline and field studies, with the aim of avoiding or minimising potential impacts on receptors wherever possible.
- 9.7.2 It is expected that the mitigation measures outlined in **Section 9.3** (Design Considerations) will be included in the design of the Proposed Development.
- 9.7.3 There is much best practice guidance which has been developed to assist developers minimise the risks associated with solar farm construction and operation; this will be used to develop site-specific mitigation measures. Measures will be proposed to control and mitigate, for example, pollution risk (from anthropogenic and geogenic sources), flood risk, watercourse crossings, impacts on surface and groundwater flow paths, and management of carbon rich soils.
- 9.7.4 Good practice measures will be applied in relation to pollution risk, and management of surface run-off rates and volumes. This will form part of the final Construction Environmental Management Plan (CEMP) to be implemented for the Proposed Development.

9.8 Matters Scoped Out

9.8.1 At this stage, it is proposed that the following can be scoped out of detailed assessment:

- Potential decommissioning effects. Decommissioning the Proposed Development will be carried out in accordance with an approved decommissioning plan which will be expected to include the same safeguards as those provided during the construction phase of the Proposed Development which will be outlined in the EIAR.
- Potential effects of geology. No sensitive geological features have been identified within the Site.
- Potential effects on the Inchcoonans GCR site and Inchcoonans Claypit SSSI. This site is designated for its geology and is located outwith the Site boundary. Any disturbance to the underlying ground will not extend beyond the immediate development footprint. As such, there is no potential for significant effects.
- An LCA report will be scoped out of the EIA assessment. A standalone LCA Report and the findings presented and assessed against policy in the Planning Statement supporting the S36 consent application.
- Potential effects on peat. The Site is shown to be underlain by mineral soils (noncalcerous gleys and brown earths), categorised as Class 0 peatland. As such, there is no peat indicated to be present at the Site. No peat management plan or peat landslide hazard risk assessment is proposed.
- Detailed Drainage Design. Outline design standards and measures which would be used to control and manage incident rainfall would be specified in the Flood Risk Assessment and Drainage Impact Assessment and summarised in the EIAR. A Site drainage design plan would be prepared as part of the detailed Site design (post planning) and form part of the final CEMP. This would be submitted to SEPA for approval at that stage.
- Water quality monitoring completed as part of the baseline assessment. Classification data is available from SEPA for the main watercourses within the Site and there are no known sources of potential water pollution at the Site that might give rise for the need for water quality monitoring.

9.9 Questions to Consultees

- Do the consultees agree that the receptors and impacts described in **Section 9.8** can be scoped out?
- Are there bodies or organisations we should consult regarding works near or within the Pows present on Site? Does SEPA guidance and standing advice apply to works near a Pow? I.e. what standoff buffer should be applied for works near a Pow?
- It is proposed that the SEPA Recommended Riparian Corridor dataset is applied for ground intrusion works associated with piling to establish solar PV arrays. Is this approach acceptable?

- It is considered that solar panels and their frames can be located in areas of flooding where a sufficient freeboard is maintained. Except for discussing these areas within the Flood Risk Assessment, what other supporting information (if any) needs to be submitted as part of the application to allow this to be assessed by consultees?
- It is assumed that flood levels at the BESS and substations will need to be established and reported in the Flood Risk Assessment and Drainage Impact Assessment so that appropriate mitigation can be secured. Is there a preferred modelling approach to be adopted for assessing flood risk at these locations?
- It is not proposed to prepare a detailed drainage design for the Indicative Photovoltaic Area. Rather measures that would be used to control the rate and quality of runoff will be specified in the Flood Risk Assessment and Drainage Impact Assessment. Is this approach acceptable?
- An outline drainage design will be prepared for the substations and BESS area which will show principal drainage routes and confirm proposed water attenuation volumes. Is this acceptable and do the drainage calculations require 3rd party review / certification before submission?
- Site investigations, including a PWS survey, and GWDTE assessment (if an NVC survey is deemed required by the project ecologists) will be undertaken as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?
- Given desk-based information indicates an absence of peatland habitat we anticipate that potential impacts on peat can be scoped out, alongside a Peat Management Plan, Peatland Condition Assessment, and Peat Landslide Hazard Risk Assessment. Do you agree?
- It is not proposed to undertake any water quality sampling, establish groundwater monitoring points, surface water monitoring points, or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact assessment. Is this acceptable?
- Please advise if there is any specific information or methodology (other than current SEPA guidance) that should be used / followed as part of the private water supply risk assessment?
- Do you agree that the scope of the proposed assessment is appropriate?

9.10 References and Guidance

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10 AIR QUALITY

10.1 Introduction

- 10.1.1 This chapter of the Environmental Impact Assessment Scoping Report (EIASR) identifies the air quality sensitive receptors of relevance to the Proposed Development. It considers the potential effects that would arise from the construction, operation and decommissioning of the Proposed Development.
- 10.1.2 On the basis that impacts on local air quality during the operational phase can be excluded, and the scale of work involved in decommissioning will be less than during construction, the only assessment required is a Construction Dust Risk Assessment (CDRA) to determine the risk of dust impacts on amenity, human health and ecological sites during the construction phase.
- 10.1.3 A CDRA is provided in this chapter to demonstrate that the potential effects can be made negligible with the proposed mitigation measures. It is proposed that effects on air quality are scoped out of the Environmental Impact Assessment (EIA). The justification for this is included in **Section 10.9**.
- 10.1.4 This chapter of the EIASR should be read alongside the following chapters:
- **Chapter 6: Ecology**
 - **Chapter 12: Traffic and Transport.**
- 10.1.5 This chapter is supported by the following figures which show the Site and the study area:
- **Figure 10.1, Figure 10.1.a, Figure 10.1.b and Figure 10.1.c: Construction Dust Risk Study Area and Human Receptors**
 - **Figure 10.2, Figure 10.2.a, Figure 10.2.b and Figure 10.2.c: Construction Dust Risk Study Area and Ecological Receptors**

10.2 Legislation, Policy and Guidance

- 10.2.1 The UK's legislation and regulatory regime along with national, regional and local planning policy play a key role in the prevention, control and minimisation of atmospheric emissions that are potentially adverse to human health and the environment. Air Quality Standards (AQS) are used as assessment criteria for determining the significance of any potential changes in local air quality resulting from development proposals.

Legislation

- 10.2.2 The scoping assessment has been undertaken in accordance with the following national and Scottish legislation:
- The Air Quality Standards Regulations, (HM Government, 2010);

- Air Quality (Scotland) Amendment Regulations 2016, (Scottish Government, 2016); and
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, (Defra et al, 2007);

Policy

10.2.3 The scoping assessment has been undertaken in accordance with the following local policy:

- The National Planning Framework 4 for Scotland (NPF4), (Scottish Government, 2023); and
- The Scottish Government Cleaner Air for Scotland Strategy 2 (CAFS), (Scottish Government, 2021).

Guidance

10.2.4 The scoping assessment has been undertaken in accordance with the following national and local guidance:

- Perth and Kinross Council Supplementary Air Quality and Planning Guidance (PKC, 2020);
- The Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction, (IAQM, 2024);
- The Institute of Air Quality Management (IAQM) Land-Use Planning and Development Control: Planning for Air Quality (IAQM, 2017);
- Local Air Quality Management Technical Guidance LAQM.TG (22), (Defra et al, 2025); and
- Perth and Kinross Council Annual Progress Report for Air Quality 2025 (PKC, 2025).

10.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 10.3.1 PKC undertakes air quality monitoring at a number of locations within the Local Authority area. The closest active monitoring sites for particulate matter in accordance with the 2025 Annual Progress Report (PKC, 2025) are in Perth and Crieff, all at roadside locations and greater than 10km from the Proposed Development. Urban particulate monitoring is also undertaken by Dundee City Council; however all sites are greater than 10km from the Proposed Development. The measured particulate concentrations at these locations are therefore not considered to be representative of levels at the Proposed Development Site.
- 10.3.2 There are no PKC Air Quality Management Areas (AQMA) within 10km of the Proposed Development, the only remaining one being the Perth City AQMA declared in 2006.

- 10.3.3 A desk-based study has been undertaken to collate data on the baseline environment using data from the Air Quality in Scotland webpages (Scottish Government, 2026) that provide baseline concentration data for oxides of nitrogen (NO_x), nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) for each 1km x 1km grid square across the country.
- 10.3.4 The data shown in **Table 10.1** have been downloaded for PM₁₀, which is the pollutant of relevance for this assessment of potential effects from construction phase activities, for each 1km x 1km grid square over an area of 64km² to cover the Site including Potential Additional Options and the Indicative Underground Cable Route Corridor.

Table 10.1: Summary of Scottish Government Predicted Background Concentrations of PM₁₀ (µg/m³)

From Grid Square Centres E 321500 to 328500, N722500 to 729500	2026 Baseline Annual Mean PM ₁₀ Concentration (µg/m ³)
Minimum	6.1
Maximum	10.9
Average	8.6
AQS Limit	18

Potential Sources of Impact

- 10.3.5 The generation of dust and particulates (for example from earth moving, open cut trenching or trenchless techniques, transport and storage of dry materials, construction of hardstanding for the Indicative Preferred BESS and substation area and construction compound/laydown areas) could potentially have an adverse (smothering) impact on dust sensitive ecological receptors; effects on human health and cause nuisance (disamenity) by dust soiling of surfaces at residential and commercial properties.
- 10.3.6 Potential impacts from exhaust emissions from construction phase traffic are considered to be negligible as it is not expected that heavy duty vehicles (HDVs) will exceed the IAQM threshold for requiring detailed assessment outside an AQMA of >100 as an annual average daily traffic (AADT) increase on any single link within the study area.

Design Considerations

- 10.3.7 Where possible, cable trenches in the Indicative Photovoltaic (PV) Area will be greater than 50m from any sensitive ecological or human receptor.

10.4 Consultation

- 10.4.1 Consultation with the PKC Environmental Health department was undertaken to agree the approach intended to scope air quality effects out of the EIA on 11th May 2026. A response was received on 29th May 2026 to confirm acceptance of the approach.

10.5 Assessment Methodology

- 10.5.1 The CDRA has been undertaken in accordance with the IAQM guidance (IAQM, 2024) and considers the number and sensitivity of human and ecological receptors within prescribed buffer zones from the construction activities in-combination with the potential magnitude of dust emissions to determine a risk of dust impacts without mitigation as high risk, medium risk, low risk or negligible. The potential significant effects after the implementation of mitigation are then determined.

Study Area and Sensitive Receptors

- 10.5.2 The study area for the CDRA has been defined in accordance with the IAQM guidance (IAQM, 2024) and includes the following sensitive receptors:
- Human receptors within 250m of the Site boundary, and within 50m of routes used by construction vehicles on the public highway, up to 250m from the Site entrance (s); and
 - Ecological receptors within 50m of the Site boundary, and within 50m of routes used by construction vehicles on the public highway, up to 250m from the Site entrance (s).
- 10.5.3 Inclusion of the assessment buffer zones around the Proposed Development boundary is considered to be conservative as the main potential sources of dust emissions are likely to be limited to construction activities within the Indicative Preferred BESS and substation areas of the Site as shown in **Figure 2.1** with limited dust creation potential in the Indicative PV Area. This allows for flexibility of location of the BESS and substation within the Proposed Development boundary.
- 10.5.4 The number of human receptors within each buffer zone is summarised in **Table 10.2**. These are shown including the Potential Additional Options and the Indicative Underground Cable Route Corridor in **Figure 10.1**, **Figure 10.1.a**, **Figure 10.1.b** and **Figure 10.1.c**.

Table 10.2: Human Receptors in Each Buffer Zone Prescribed by the IAQM Guidance

Receptor Type	Within 20m Buffer	Within 50m Buffer	Within 100m Buffer	Within 250m Buffer
Buffers Around Proposed Development Site				
Commercial	10	19	34	52
Residential	62	148	227	354
Total	72	167	261	406
Buffers around Proposed Development Site including Potential Additional Options and Indicative Underground Cable Corridor Route Corridor				
Commercial	10	19	41	63

Receptor Type	Within 20m Buffer	Within 50m Buffer	Within 100m Buffer	Within 250m Buffer
Residential	66	161	256	392
Total	76	180	297	455

10.5.5 The number of ecological receptors within the prescribed IAQM 50m buffer zone is summarised in **Table 10.3**. These are shown in **Figure 10.2**, **Figure 10.2.a**, **Figure 10.2.b** and **Figure 10.2.c**.

Table 10.3: Ecological Receptors in Each Prescribed IAQM Buffer Zone

Receptor Type	Within 20m Buffer	Within 50m Buffer
Ancient Woodland (Woodland ID – 19673 Antiquity – 2b Long-Established (of plantation origin)	1	1
RAMSAR (Firth of Tay and Eden Estuary RAMSAR)	1	1
Special Area of Conservation (SAC) (Firth of Tay and Eden Estuary SAC)	1	1
Special Protected Area (SPA) (Firth of Tay and Eden Estuary SPA)	1	1
Site of Special Scientific Interest (SSSI) (Inner of Tay Estuary SSSI and Inchcoonans Claypit)	2	2

Sensitivity

10.5.6 The sensitivity of the area to dust impacts, can be defined as low, medium, or high sensitivity, in accordance with the IAQM 2024 construction dust guidance. The criteria for receptor sensitivity are outlined in **Table 10.4**.

Table 10.4: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High	Where human receptors are expected to be present continuously for extended periods of time and where a high level of amenity is expected, for example, residential properties, hospitals, schools, and care homes. Internationally or nationally designated ecological sites where the designated features may be affected by dust soiling, or where there is a particular dust sensitive species.

Sensitivity of Receptor	Criteria
Medium	Where human receptors wouldn't reasonably be expected to be present continuously or regularly for extended periods and where a reasonable level of amenity is expected, which could be diminished by dust soiling, for example, parks and places of work. Nationally designated ecological sites with dust sensitive features.
Low	Where enjoyment of amenity would not reasonably be expected and exposure would be for limited periods, for example, e.g., footpaths, shopping streets, and car parks. Locally designated ecological sites where the features may be affected by dust.
Negligible	Designated features with no sensitivity to dust deposition.

- 10.5.7 All commercial receptors have been allocated a sensitivity of low and all residential receptors have been allocated a sensitivity of high.

Sensitivity of the Area to Dust Soiling

- 10.5.8 The sensitivity of the area to dust soiling effects on people and property as defined in the IAQM guidance is shown in **Table 10.5**.

Table 10.5: IAQM Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

- 10.5.9 Based on the data in **Table 10.2**, **Table 10.4** and **Table 10.5**, the maximum sensitivity of the area for dust soiling effects on people and property is high as there are >100 highly sensitive receptors within 50m of potential dust generating construction activities, and 10-100 within 20m of the Primary Access Route, although not all in the one area or exposed to emissions at the same time. Including the potential additional options areas and indicative cable routes does not change the sensitivity of the area.

Sensitivity of the Area to Human Health Impacts

- 10.5.10 The IAQM guidance to determine the sensitivity of the area to human health impacts depends on the sensitivity and number of receptors within each prescribed buffer zone and the existing background concentration of PM₁₀. The maximum existing baseline from **Table 10.1** is 10.9µg/m³ (less than the IAQM criteria of 14µg/m³ in Scotland), therefore the relevant criteria for low (commercial) and high (residential) sensitivity receptors are shown in **Table 10.6**.

Table 10.6: IAQM Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration in Scotland	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<250
High	<14µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

- 10.5.11 Based on the data in **Table 10.2**, **Table 10.4** and **Table 10.6**, the maximum sensitivity of the area to human health impacts is low.

Sensitivity of the Area to Ecological Impacts

- 10.5.12 The sensitivity of the ecological receptors has been reviewed in consultation with the project ecologist and is described in **Chapter 6: Ecology**. The habitats recorded during the Phase 1 survey were confirmed as not particularly sensitive to dust and are likely regularly subject to dust raised during agricultural activities such as ploughing, so a considerable amount of dust would need to be generated over a long period to be detectable over and above occasional baseline conditions. There is no Indicative Underground Cable Route Corridor within 50m of any designated site boundaries. Any cable trenching required in the Indicative PV Area will be a maximum of 50m from the boundary of the designated ecological sites. The ecological sites have been allocated a receptor sensitivity of low. The IAQM guidance to determine the sensitivity of the area to ecological impacts depends on the sensitivity and distance from source and is shown in **Table 10.7**.

Table 10.7: IAQM Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

- 10.5.13 Based on the data in **Table 10.3**, **Table 10.4** and **Table 10.7**, the maximum sensitivity of the area to ecological impacts is low.

Summary of Sensitivity of the Area

- 10.5.14 The outcome of defining the sensitivity of the area is summarised for earthworks, construction and trackout in **Table 10.8**. There is no demolition associated with the Proposed Development so this has not been considered further.

Table 10.8: Summary of the Sensitivity of the Area using IAQM Guidance

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	High
Human Health	Low	Low	Low
Ecological	Low	Low	Low

Magnitude of Impact

- 10.5.15 The scale and nature of the construction work determine the magnitude of dust arising as small, medium, or large. The relevant criteria to define the potential magnitude of dust emissions includes the factors in accordance with the IAQM construction dust outlined in **Table 10.9**.

Table 10.9: Defining Dust Emissions Magnitude

Magnitude of Potential Impact	Criteria
Small	Demolition volume under 12,000m ³ less than 6m above ground level, total site area less than 18,000m ² , soil type with large grain size, formation of bunds less than 3 m in height, total construction building volume less than 12,000m ³ , construction material with low potential for dust release, less than 20 outward HDV trips per day, unpaved road length less than 50 m
Medium	Demolition volume between 12,000m ³ and 75,000m ³ at 6m to 12m above ground level, total site area between 18,000m ² and 110,000m ² , moderately dusty soil type, formation of bunds between 3m and 6m, potentially dusty construction material, total building volume between 12,000m ³ and 75,000m ³ , 20 to 50 outward HDV trips per day, unpaved road length 50m to 100m.
Large	On-site crushing and screening demolition, demolition volume greater than 75,000 m ³ at greater than 12m above ground level, total site area greater than 110,000m ² , potentially dusty soil type, more than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 6 m in height, total building volume greater than 75,000m ³ , on-site concrete batching, sandblasting, more than 50 outward HDV trips per day, unpaved road length greater than 100m.

Magnitude of Impacts of Earthworks

- 10.5.16 The maximum magnitude of impact associated with earthworks has been defined as large due to the area for the proposed Indicative Preferred BESS and substation being >110,000m².
- 10.5.17 The focus areas for the impact assessment are as shown in **Figures 10.1.a, 10.1.b** and **10.1.c** where there are clusters of residential properties within 20m of the Potential Additional Option for PV. The magnitude of impact associated with cable trenching is small as it is

unlikely that an area >18,000m² with the potential to generate dusty emissions will be exposed close to sensitive receptors at any one time.

- 10.5.18 The magnitude of impact next to ecological receptors is small.

Magnitude of Impacts of Construction

- 10.5.19 The magnitude of impact associated with construction has been defined as medium due to the proposed footprint of the substation combined with an assumed hardstanding concrete pour of 1m being between 12,000m³ and 75,000m³. Should an enclosed indoor solution be selected this would involve the erection of a steel shed-type structure that would not increase construction phase dust generation. Should any concrete batching take place at the Indicative Preferred BESS and substation site, the emissions from the plant will be controlled and regulated by the Scottish Environment Protection Agency (SEPA) and as such will have controls to minimise the release of dusty emissions from this activity.

- 10.5.20 The magnitude of impact of construction activities associated with the Indicative PV Area is small as the construction methods to secure panels typically include driving metal poles directly into the ground or drilling ground screws into softer soils without the requirement for extensive digging. This applies for dust soiling, human health, and ecological impacts.

Magnitude of Impacts of Trackout

- 10.5.21 The maximum magnitude of impact associated with trackout has been defined as large as there are likely to be multiple routes that will, during peak construction, experience >50 outward HDV movements onto potentially dusty surfaces as it is not yet known which access routes to development parcels will be on entirely paved roads.
- 10.5.22 A small area of the Inchcoonans Claypit SSSI is adjacent to one of the proposed access routes as shown in **Figure 10.2.c**. The access route in this location is an existing paved road and the magnitude of impact due to trackout at this location is considered to be small.
- 10.5.23 The risk of dust impacts is determined by the combination of the sensitivity of the area and the dust emission magnitude as shown in **Table 10.10** for earthworks, construction and trackout in accordance with the IAQM guidance.

Table 10.10: Defining Dust Impact Risk

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Low Risk

Significance of Effect

- 10.5.24 The IAQM construction dust guidance categorises the unmitigated risk of dust impacts on human health, amenity, and ecological receptors (rather than ascribing a significance of effect), as a means of identifying the level of dust emissions mitigation required to ensure

that residual effects are 'not significant' in EIA terms. A higher dust risk rating requires more stringent mitigation measures in order to limit residual effects.

- 10.5.25 The risk of dust impacts has been determined without implementation of any mitigation in accordance with the IAQM guidance. Following determination of these risks, proportionate mitigation measures for inclusion in a Construction Environment Management Plan (CEMP), or as a separate dust management plan (DMP), to secure their effective implementation have been made in **Section 10.8**. A residual assessment has then been undertaken assuming the implementation of recommended mitigation, in accordance with IAQM guidance to determine whether the construction dust risk is significant or not and if it can be scoped out of the EIA.

10.6 Cumulative Assessment

- 10.6.1 There are no other construction projects that require a cumulative assessment with the Proposed Development in this chapter.

10.7 Potential Significant Effects

Risk of Dust Impacts due to Earthworks

- 10.7.1 There is only one high sensitivity residential receptor within 250m of the Indicative Preferred BESS and substation area, therefore in accordance with **Table 10.5**, the sensitivity is low. In accordance with **Table 10.10**, the low sensitivity with a large impact magnitude results in a Low Risk of impacts of dust soiling and on human health from earthworks.
- 10.7.2 Within the focus areas in **Figures 10.1.a, 10.1.b and 10.1.c** the sensitivity of the area due to the number of receptors is high. In accordance with **Table 10.10**, the high sensitivity with a small impact magnitude results in a Low Risk of impacts of dust soiling and on human health from earthworks.
- 10.7.3 The low sensitivity of the area to ecological impacts with the small impact magnitude within 50m of designated sites results in a Low Risk of ecological impacts due to earthworks.

Risk of Dust Impacts due to Construction

- 10.7.4 There is only one high sensitivity residential receptor within 250m of the Indicative Preferred BESS and substation area, therefore in accordance with **Table 10.5**, the sensitivity is low. In accordance with **Table 10.10**, the low sensitivity with a medium construction impact magnitude results in a Low Risk of impacts of dust soiling and on human health from Construction.
- 10.7.5 The low sensitivity of the area to ecological impacts with the small impact magnitude within 50m of designated sites results in a Low Risk of ecological impacts due to construction.

Risk of Dust Impacts due to Trackout

- 10.7.6 The maximum sensitivity of the area to impacts from trackout is high. In accordance with **Table 10.10**, the high sensitivity with a large impact magnitude results in a High Risk of impacts of dust soiling due to trackout.

- 10.7.7 The low sensitivity of the area to impacts on human health with a large impact magnitude results in a Low Risk of impacts on human health due to trackout.
- 10.7.8 The low sensitivity of the area to ecological impacts with the small impact magnitude within 50m of designated sites results in a Low Risk of ecological impacts due trackout.
- 10.7.9 The summary of the risk of dust impacts without mitigation during each activity of the construction phase in accordance with the IAQM guidance is presented in **Table 10.11**.

Table 10.11: Summary Dust Risk – Potential Significant Effects

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Low Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk
Ecological	Low Risk	Low Risk	Low Risk

10.8 Approach to Mitigation

- 10.8.1 A CEMP will be prepared for the Proposed Development and will include a specific Dust Management Plan (or plans for individual activities/areas) to minimise the generation and potential impacts of dust emissions on receptors relevant for human health, amenity, and ecology.
- 10.8.2 The Dust Management Plan within the CEMP will include best practice measures in accordance with the IAQM recommended guidance (IAQM, 2024) proportionate to the likely impacts.
- 10.8.3 The main measures for dust management that will be included are summarised in **Paragraphs 10.8.4 to 10.8.11**.

Proposed Mitigation for Communications

- 10.8.4 As part of a wider Proposed Development communication plan the Principal Contractor will be required to:
- Display the name and contact details of person(s) accountable for air quality and dust issues at each main construction compound/hub.
 - Display the head or regional office contact information.

Proposed Mitigation for Site Management

- 10.8.5 In relation to management of the Site, the Principal Contractor will be required to:
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.

- Make the complaints log available to PKC when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.

Proposed Mitigation for Preparing and Maintaining the Site

10.8.6 In relation to preparing and maintaining the Site, the Principal Contractor will be required to:

- Plan the Site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on-site where there are receptors within 250m.
- Fully enclose the Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period, for example, fine screen fencing or temporary construction tent.
- Avoid Site runoff of water or mud.
- Keep Site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on the Site.
- Cover, seed or fence stockpiles to prevent wind whipping.

Proposed Mitigation for Construction Site Operations

10.8.7 In relation to construction Site operations the Principal Contractor will be required to:

- Ensure all Non-Road Mobile Machinery (NRMM) is compliant with the engine emission regulations in place at the time of use on-site.
- Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event, using wet cleaning methods.
- Prohibit bonfires and burning of waste materials.

Proposed Mitigation for Monitoring

10.8.8 In relation to monitoring the Principal Contractor will be required to:

- Carry out regular Site inspections to monitor compliance with the Dust and Air Quality Management Plan, record inspection results, and make an inspection log available to PKC when asked.
- Increase frequency of Site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Proposed Mitigation Specific to Earthworks

10.8.9 In relation to earthworks the Principal Contractor will be required to:

- Re-vegetate earthworks and exposed areas/soils stockpiles to stabilise surfaces as soon as practicable.
- Use hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.

Proposed Mitigation Specific to Construction Activities

10.8.10 In relation to construction the Principal Contractor will be required to:

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Proposed Mitigation Specific to Trackout

10.8.11 In relation to trackout the Principal Contractor will be required to:

- Use water-assisted dust sweeper(s) on the Primary Access Route and local roads, to remove, as necessary, any material tracked out of the Site.
- Avoid dry sweeping of large areas.

- Ensure vehicles entering and leaving Sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a Site logbook.

10.9 Matters Scoped Out

- 10.9.1 The CDRA included in this chapter has demonstrated that without mitigation there is a maximum potential effect of a high risk of dust soiling impacts at sensitive human receptors adjacent to trackout routes and a low risk of dust soiling and human health impacts for all other activities. There is a low risk of effects at ecological receptors.
- 10.9.2 With the implementation of the proposed mitigation outlined in **Section 10.8**, it is concluded that the effect of the construction phase dust emissions can be reduced to low risk or negligible and the residual effects are therefore '**not significant**.' It is proposed that air quality impacts are **scoped out** of the EIA.

10.10 Questions to Consultees

- Do consultees agree that further assessment of air quality impacts can be scoped out of the EIA?

10.11 References and Guidance

- (Defra et al, 2007) Welsh Assembly Government, Scottish Executive, Department of the Environment, Department for Environment Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales, and Northern Ireland, 2007. Available at: [Air Quality Strategy Vol 1](#)
- (Defra et al, 2025) Defra in partnership with the Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs Defra, Local Air Quality Management Technical Guidance TG22 version 2.1, (2025). Available at: laqm.defra.gov.uk/wp-content/uploads/2021/03/LAQM-TG22-May-25-v2.1.pdf
- (H.M Government, 2010) The Air Quality Standards Regulations, 2010. Available at: [The Air Quality Standards Regulations 2010](#)
- (IAQM 2017) Land-Use Planning and Development Control: Planning for Air Quality. Available at: [air-quality-planning-guidance.pdf](#)
- (IAQM 2024) IAQM Guidance on the assessment of dust from demolition and construction V1.1. Available at: <http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdfText>

- (PKC, 2020) Perth and Kinross Council Supplementary Air Quality and Planning Guidance. Available at: [Air_Quality_and_Planning_SG_2020_adopted.pdf](#)
- (PKC, 2025) 2025 Air Quality Annual Progress Report (APR) for Perth and Kinross Council In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021 Local Air Quality Management, August 2025. Available at: [2025 Air Quality Annual Progress Report](#)
- (Scottish Government, 2016) The Air Quality (Scotland) Amendment Regulations 2016. Available at: [The Air Quality \(Scotland\) Amendment Regulations 2016](#)
- (Scottish Government, 2021), Cleaner Air for Scotland 2 – Towards a Better Place for Everyone. Available at: [Cleaner Air for Scotland 2 Delivery Plan](#)
- (Scottish Government, 2023), National Planning Framework 4, (2023). Available at: [National Planning Framework 4 - gov.scot](#)
- (Scottish Government, 2026) Air Quality in Scotland webpages [Data for Local Authority Review and Assessment purposes](#)

11 NOISE AND VIBRATION

11.1 Introduction

- 11.1.1 This chapter of the Environmental Impact Assessment Scoping Report (EIASR) outlines the proposed approach for assessing potential noise and vibration effects as a result of the Proposed Development.
- 11.1.2 The assessment will include effects due to construction, including construction traffic impacts; and the operational effects due to the proposed photovoltaic (PV) array, Battery Energy Storage System (BESS), substations and associated plant and infrastructure.

11.2 Legislation Policy and Guidance

- 11.2.1 The noise and vibration assessment will be undertaken with due regard to the following legislation, planning policy, standards and design guidance.

Legislation

- The Control of Pollution Act 1974;
- The Environmental Protection Act 1990;
- The Pollution Prevention and Control (Scotland) Regulations 2012; and
- The Environmental Noise (Scotland) Regulations 2006.

Policy

- National Planning Framework 4; and
- Perth and Kinross Local Development Plan 2 (PKLDP2).

Guidance

- Planning Advice Note PAN1/2011;
- BS 4142: 2014+A1:2019 Methods for rating and assessing industrial and commercial sound;
- BS 5228-1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise;
- BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration;

- BS 7445-1: 2003: Description and measurement of environmental noise. Guide to quantities and procedures, gives guidance on quantities and procedures for description and measurement of noise in community environments;
- BS 8233: 2014: Sound Insulation and Noise Reduction for Buildings; and
- ISO 9613-1: 2024: Acoustics -- Attenuation of sound during propagation outdoors

11.3 Baseline and Potential Sources of Impact

Study Area

- 11.3.1 The Study Area considered in this assessment will encompass the land within the Proposed Development boundary, including Potential Additional Options for Habitat Mitigation and Underground Cable Route, and the nearest residential noise sensitive receptors (NSRs) which may be impacted upon by noise emissions from the Site.
- 11.3.2 Noise levels due to the Proposed Development at more distant NSRs will be lesser than at the closest NSRs, therefore compliance with criteria at the closest NSRs will incorporate compliance at those more distant.

Existing Baseline Conditions

- 11.3.3 The baseline conditions at the Site and nearest sensitive receptors are expected to be dominated by noise from the surrounding road network, particularly close to the A90, with local and distant road traffic, a railway line to the south of the Site and Perth, Leuchars and Dundee airports/airfields contributing to the noise environment.
- 11.3.4 A baseline survey will be undertaken over a period of approximately 1 week at measurement positions to be agreed with Perth and Kinross Council (PKC) Environmental Health. A desk-based review and consultation will be undertaken to identify potentially sensitive receptors.

Potential Sources of Impact

Construction Activities and Noise Impacts

- 11.3.5 The potential temporary impacts of construction noise may arise from:
- construction of access tracks and construction compound;
 - use of specific construction techniques to accommodate module support structure legs;
 - installation of beams and rails to support Photo Voltaic (PV) modules;
 - installation of the PV modules;
 - cabling to connect to the inverters and transformer stations;
 - construction activities at the substation including any potential landscaping;

- cable laying and pulling activities;
- heavy goods vehicles servicing the BESS compound and substation, delivering or removing materials (including spoil and fill) and plant; and
- vibration will only be considered as an issue where heavy piling works or horizontal directional drilling (HDD) in proximity to receptors are required.

11.3.6 These activities could temporarily increase the noise levels experienced at identified receptors throughout the study area.

Construction Road Traffic and Noise Impacts

11.3.7 There is potential for road traffic associated with the construction phase to impact noise sensitive receptors due to increases in traffic flow or change of composition of Heavy Goods Vehicles (HGV).

Operational Noise Impacts

11.3.8 There are unlikely to be any noise and vibration impacts relating to operational or maintenance vehicular traffic as visits will be limited in number. It is therefore proposed that noise impacts arising from maintenance vehicular traffic should be scoped out from further consideration within the Environmental Impact Assessment Report (EIAR).

11.3.9 Noise impacts during the operational phase are most likely to arise from the operation of equipment within the PV array (inverters, transformers), BESS (batteries and associated electrical plant) and substation (for example, reactors and transformers). Therefore, an assessment will be undertaken to determine the likely environmental and health impacts due to operational noise emissions on identified sensitive receptors.

11.3.10 No sources of potential vibration will be present at the Proposed Development during operation. Operational vibration is, therefore, proposed to be scoped out of consideration in the EIAR.

Decommissioning

11.3.11 No decision has been made regarding the final decommissioning policy for the Proposed Development, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the equipment would be removed and reused or recycled.

11.3.12 The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator.

11.3.13 It is anticipated that the decommissioning impacts would be similar in nature to those of construction but would be more limited in geographical extent and timescale. Assessment of decommissioning works is, therefore, scoped out of further assessment.

Design Considerations

Construction & Decommissioning

11.3.14 The construction and decommissioning works would use Best Practicable Means (BPM) to limit the impacts of noise at sensitive receptors. Those measures would be detailed within

the EIAR and set out in a Site specific Construction Environmental Management Plan (CEMP).

Operation

- 11.3.15 Operational design measures to be considered as part of the Proposed Development would involve:
- use of suitable buffer distances between noise generating plant and NSRs;
 - selection of quieter equipment where reasonably practicable;
 - installation of acoustic enclosures;
 - installation of acoustic barriers;
 - screening by landform/embankment;
 - silencing of exhausts/outlets for air handling/cooling units; and
 - locating equipment to take advantage of screening inherent in the design, for example from the PV panels, substation or control room buildings where reasonably practicable.

11.4 Consultation

- 11.4.1 Consultation with PKC EHOs will continue throughout the assessment process regarding the following:
- the status of identified potential NSRs;
 - noise monitoring positions for the baseline survey;
 - the construction and operational assessment methodology;
 - identification of potential cumulative effects and a detailed method for the consideration of potential cumulative effects; and
 - the derivation of appropriate noise limits.

11.5 Survey and Assessment Methodology

Surveys

- 11.5.1 Background noise monitoring will be undertaken at residential properties where the potential for significant noise effects from the Proposed Development is identified and where needed to inform the construction assessment. Any surveys will be agreed in continuous consultation with PKC throughout the EIAR process and will be carried out for a sufficient period to allow typical sound levels to be established, taking account of different types of noise sources and weather conditions that occur. Noise surveys may be accompanied by the acquisition of supplementary non-acoustic data (rainfall and wind records), as required.

- 11.5.2 Baseline survey measurements will be conducted in accordance with current guidance, including BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound, and BS 7445-2:1991 Description and measurement of environmental noise.

Assessment Methodology

Construction

- 11.5.3 BS5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites details the “ABC method”, which specifies a construction noise limit based on the existing ambient noise level and for different periods of the day. Therefore, the EIAR will assess the predicted construction noise levels against noise limits derived from advice within Annex E of BS 5228.

Operation

- 11.5.4 Where there are noise sources such as fixed plant associated with industrial operations, best practice recommends these should be assessed using BS 4142:2014+A1:2019 guidance. The guidance describes a method of determining the specific sound level from an industrial noise source. Acoustic characteristics such as tonality, intermittency, impulsivity of the sound sources should be considered to derive a rating level for an initial assessment. The rating level is compared with the existing background noise level to determine potential impacts. Where applicable, BS4142 recommends undertaking a modified assessment, considering the context of the environment within which the sound sources will be operational.

Cumulative Assessment

- 11.5.5 Potential cumulative effects of relevant nearby developments will be considered where there are shared NSRs and where an appropriate noise assessment report is available.

11.6 Potential Significant Effects

- 11.6.1 As the nearest NSRs are located close to the Site boundary, the construction phase has the potential to generate temporary adverse noise effects.
- 11.6.2 The operational PV array, BESS and substation will contain noise generating equipment and plant. Without good acoustic design and suitable noise mitigations, the operation of the Proposed Development has the potential to generate adverse sound effects at the nearest NSRs.

11.7 Matters Scoped Out

- 11.7.1 The following matters will be scoped out of the Noise and Vibration chapter of the EIAR:
- Construction vibration will only be considered where heavy piling works or HDD are proposed in proximity to receptors;
 - Noise and vibration from decommissioning;
 - Operational road traffic; and

- Operational vibration.

11.8 Questions to Consultees

- Do consultees agree that all potentially significant sources of noise and vibration from the Proposed Development activities have been identified?
- Do consultees agree that appropriate standards and methods of assessment are proposed based on the potential for noise impact?
- Do consultees agree with the proposed scope?
- Are there any developments or infrastructure schemes which should be taken into account when considering potential cumulative noise impacts?

11.9 References and Guidance

- Perth & Kinross Council. 2019. Perth and Kinross Local Development Plan 2. Perth and Kinross Council.
- BSI Publications. 2019. "BS4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound."
- BSI Publications. 2003. "BS7445:2003 Description and measurement of environmental noise, Guide to quantities and procedures."
- BSI, (2014). British Standards Institution [BS] 5228-2: 2009+A1:2014 "Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration". BSI London
- BSI Publications. 2014. "BS8233:2014 Guidance on sound insulation and noise reduction in buildings."
- ISO. 1993. "ISO 9613 Acoustics - Attenuation of sound during propagation outdoors, Part 1: Calculation of the absorption of sound by the atmosphere, Part2: General method of calculation."
- Scottish Government. 2024. National Planning Framework 4. Scottish Government.
- Scottish Government. 2011. Planning Advice Note 1, PAN1/2011. Scottish Government.

12 TRAFFIC AND TRANSPORT

12.1 Introduction

- 12.1.1 This chapter sets out the proposed scope and approach to assessing potential direct and indirect impacts of the Proposed Development on access, traffic and transport during construction, operation and decommissioning phases. Within this chapter, preliminary baseline data is presented and potential effects that may arise as a result of the Proposed Development are outlined. Assessment of cumulative effects will also be included within the scope of the Traffic and Transport assessment.
- 12.1.2 The methodology presented in this chapter builds upon the general assessment methodology summarised in **Chapter 3: EIA Process and Methodology** of this Environmental Impact Assessment Scoping Report (EIASR).

12.2 Legislation Policy and Guidance

- 12.2.1 The Proposed Development has the potential to introduce impacts during construction, operation and decommissioning relating to traffic. The environmental effects of traffic will be assessed in accordance with the following principal sources.

Legislation

- 12.2.2 There is no legislation specific to transport assessments that is required to be considered as part of the assessment in the Environmental Impact Assessment Report (EIAR).

Policy

- 12.2.3 The assessment will be undertaken in accordance with policies outlined in the following plans:
- National Planning Framework 4 (2023);
 - Perth and Kinross Local Development Plan 2 (PKLDP 2), 2019; and
 - Other relevant local policy, as appropriate.

Guidance

- 12.2.4 The following principal guidance will be used to inform the assessment (but not limited to):

- Institute of Environmental Management and Assessment (IEMA⁴⁷) guidelines for the Environmental Assessment of Traffic and Movement (2023);
- LA103 Scoping for Environmental Assessment (Revision 1), Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020);
- LA104, Environmental assessment and monitoring, Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020); and
- Transport Assessment Guidance (Transport Scotland, 2012).

12.3 Baseline and Potential Sources of Impact

Study Area

12.3.1 The Study Area for the assessment will comprise the public road network likely to be used by vehicles travelling to and from the Proposed Development in its immediate vicinity. It will comprise the following links:

- A90(T) Friarton Bridge to Fraserburgh, north/southbound carriageways between and including the Inchmichael and Inchtute Interchanges plus slip roads and overbridges;
- C402 – A90(T) Inchmichael Interchange to the C401 (by The Croft);
- U142 – C402 to Charleston Farm Access;
- U142 – Charleston Farm Access to Main Road, Kinnaird;
- Private Road – Access Road to “Oldwood”;
- B953 A90(T) Inchtute Interchange via the flyover to Main Road, Inchtute (part, north of Inchtute Interchange);
- C401 – U142 by Kinnaird to B953 south of New Mains Farm;
- U151 – A90(T) Inchmichael Interchange to Station Road, Errol Station;
- Station Road, Errol Station;
- U151 – Station Road, Errol Station to C484 East of Errol;
- U150 – A90(T) by Horn Farm to Main Road, Grange;

⁴⁷ IEMA formally became the Institution of Sustainability and Environmental Professionals (ISEP) in July 2025. Guidance published before this date remains copyright of IEMA. However, for consistency across all subject matter chapters, subsequent reference to the Traffic and Movement guidance herein will be the ISEP guidance.

- U155 – A90(T) Junction at Shipbriggs to Loan Brae, Errol (part); and
- New Farm Access Road (Core Path: EROL/111 and EROL/104).

12.3.2 For the scoping stage of the design evolution, an indicative location of proposed access points is shown in **Figure 2.2**. The exact location and layout of the accesses will be discussed and agreed with Perth and Kinross Council's (PKC) Roads Department. It has been assumed for Scoping that where Site plots abut, access will be through the nearest plot from the adjoining public road.

Existing Baseline Conditions

A90(T) Friarton Bridge, Perth to Fraserburgh

12.3.3 A dual 2-lane all-purpose carriageway trunk road is maintained by Transport Scotland (TS) and their maintenance partner Amey. Vehicular access is provided by both at-grade junctions and grade-separated interchanges and there are intermittent at-grade pedestrian crossing facilities. It is subject to the National Speed Limit.

C401 - U142 by Kinnaird to B953 south of New Mains Farm

12.3.4 Located to the north of the A90(T) Inchtute Interchange. Section of the C402 immediately to the north of the A90(T) is a single 2-lane carriageway after that it narrows down to a wide single-track construction with passing places and is maintained by PKC. It is subject to a 40mph speed limit and designated as "Walking & Cycle Friendly Road".

C402 – A90(T) Inchmichael Interchange to the C401 (by The Croft).

12.3.5 Located to the north of the A90(T) Inchmichael Interchange, the road is a single 2-lane carriageway narrowing to a single-track construction with passing places north of the access road to "Oldwood" and is maintained by PKC. It is subject to a 40mph speed limit.

U142 – C402 to Charleston Farm Access and Main Road, Kinnaird

12.3.6 Located to the east of the C402, the road is a single 2-lane carriageway between its junction with C402 and the settlement of Westown where it then narrows to a wide single-track construction. It is maintained by PKC. It is subject to a 40mph speed limit.

U150 – A90(T) by Horn Farm to Main Road, Grange

12.3.7 Located to the south of the A90(T) Inchmichael Interchange. The road is 2-lane single carriageway, narrowing to a wide single-track construction with passing places east of Perthshire Caravans, some 650m from its junction with the U151. It is maintained by PKC. It is subject to a national speed limit between its junction with U151 and Grange Pow crossing where the speed limit changes to 40mph.

U151 – A90(T) Inchmichael Interchange to C484 East of Errol (including Station Road, Errol Station)

12.3.8 Located to the south of the Inchmichael Interchange, the road is a 2-lane single carriageway, narrowing to single-track (for a distance of approximately 125 metres) at East Inchmichael before reverting back to single carriageway as it continues southeast. It crosses the Dundee to Perth railway line at Errol Station (disused) and then on to its junction with the C484. It is

maintained by PKC. It is subject to a national speed limit between Inchmichael Interchange and north of East Inchmichael where the speed limit changes to 40mph.

U155 – A90(T) Junction at Shipbriggs to Loan Brae, Errol (part)

- 12.3.9 Located to the south of the A90(T) from an at-grade junction north of the property “Shipbriggs”. The road is 2-lane single carriageway, crossing the Dundee to Perth railway line approximately 900m south of the A90(T) and leads to the village of Errol. It is maintained by PKC. It is subject to a national speed limit between the A90(T) and Inchcoonans where the speed limit changes to 40mph.

B953 A90(T) Inchtute Interchange via the flyover to Main Road, Inchtute (part, north of Inchtute Interchange).

- 12.3.10 Located to the north of the A90(T) Inchtute Interchange from the northbound off-slip dumbbell roundabout. The road is a 2-lane single carriageway running parallel to the A90(T) to the northbound on-slip from the “Horse-Shoe” Truck Stop roundabout before turning north. It is maintained by PKC. It is subject to national speed limit.

New Farm Access Road (Core Path: EROL/111 and EROL/104)

- 12.3.11 Located to the south of the C484 opposite the junction with the U151, the road is of single-track construction and has a bituminous paved surface as far as New Mains Farm where it changes to a compacted unbound surface. This access road is not maintained by the Local Road Authority. No formal speed limit applies. It forms part of the PKC Core Path Network.

Potential Additional Options and Indicative Underground Cable Route Corridor

- 12.3.12 The following road links have been included in an expanded Study Area to cover Potential Additional Options for PV, Biodiversity Enhancement, Habitat Mitigation and the Indicative Underground Cable Route Corridor:
- C484 from Station Road Errol to Main Road Grange – a section of the road extending from the U151 Station Road eastwards towards the village of Grange. The road is a 2-lane single carriageway. It is maintained by PKC. It is subject to national speed limit.

Potential Sources of Impact

- 12.3.13 Where the ISEP thresholds are likely to be exceeded, consideration of the environmental effects of construction traffic would typically be undertaken in relation to the following transport effects:
- Severance of communities;
 - Road vehicle driver and passenger delay;
 - Non-motorised user delay;
 - Non-motorised amenity;
 - Fear and intimidation;

- Road user and pedestrian safety; and
- Hazardous/Large loads.

- 12.3.14 In addition to this, the overall carrying capacity of the road in question will be considered in undertaking the assessment. A quantitative assessment of impact would be undertaken, based on the predicted rise in traffic flows against a measured baseline, considering the temporary nature of the works. The reasonable worst-case scenario will be described for the periods of peak traffic generation, with the daily numbers of vehicle movements predicted.
- 12.3.15 The assessment will identify the potential traffic and associated environmental effects on sensitive receptors and mitigation will be proposed where necessary. Traffic flows will increase on routes used for access to the Site. Specific stretches of the local road network may need to be closed for a temporary period to facilitate the delivery of abnormal loads. At this stage of the design it is anticipated that the abnormal loads would be routed off the A90(T) via Inchmichael Interchange, U151 and U150 towards the proposed substation location.
- 12.3.16 Assessment of the routeing of the components, specifically a 400kV substation transformer, will be investigated from a potential Port of Entry (PoE). Specific requirements for the transport of Abnormal Loads between PoE and the Site would be determined from an Abnormal Indivisible Route Assessment (ALRA) Report.
- 12.3.17 The construction phasing and vehicle access would be managed to ensure that flows would be controlled during periods of more significant disruption, with mitigation likely to take the form of a Construction Traffic Management Plan (CTMP).

12.4 Consultation

- 12.4.1 No Traffic and Transport consultation activities have been undertaken to support this scoping exercise.
- 12.4.2 Key stakeholders for the Traffic and Transport subject matter are listed below. During subsequent stages of the Proposed Development, there will be consultation and discussions held with the following:
- Transport Scotland (and their maintenance partner Amey); and
 - PKC Roads Department.
- 12.4.3 The Traffic and Transport consultation will seek to:
- Secure agreement of a Study Area for construction traffic, along with traffic distribution;
 - Seek to agree the principle of the access strategy, including access location and layout where this interfaces with the public road network;
 - Specify aspects of the environment and issues relating to those that should be considered and addressed in the EIAR chapter with an emphasis on any issues local to the Proposed Development;

- Comment on or recommend, where appropriate, assessment methodologies for the EIAR chapter, particularly in relation to sensitive receptors; and
- Identify other relevant bodies or organisations that may have a vested interest in the Proposed Development (e.g. The British Horse Society and Community Councils) or be able to provide relevant information.

12.5 Survey and Assessment Methodology

- 12.5.1 The Study Area for the assessment will focus on the routes used for access by construction vehicles.
- 12.5.2 Effects during the operation of the Proposed Development will be limited, with no more than occasional journeys by domestic scale vehicles during routine maintenance, and therefore these effects are proposed to be scoped out of the access, traffic and transport assessment.
- 12.5.3 A desk-based review of the impacts arising from the construction of the Proposed Development will be undertaken, including the following:
- Collection and analysis of available road traffic accident data over the Study Area;
 - Determination of a construction phase programme and quantification of construction phase trips based on the quantity of material required for the Proposed Development and the duration of the construction phase;
 - Determination of a traffic baseline, taking account of measured existing traffic flow and other developments that have been identified for inclusion within the cumulative assessment; and
 - Quantification of material increases in traffic resulting from the construction phase of the Proposed Development.
- 12.5.4 The most recent available five-year injury accident data will be obtained for the local and strategic road network in the Study Area from Department for Transport (DfT) Open Data, PKC and TS, as appropriate, to identify any existing issues which may require to be addressed as part of the study.
- 12.5.5 Data gathered and processed for the access, traffic and transport assessment will be prepared in a suitable format to inform the Noise impacts which are considered separately in **Chapter 11: Noise and Vibration** of this EIAR.

Surveys

- 12.5.6 Desk-based and field surveys of the Study Area will be carried out to ensure a full understanding of the local area and to identify relevant receptors. A provisional list of receptors is summarised in the Assessment Methodology subsection, **Paragraph 12.5.12**. A Site visit has already been carried out to gather relevant information on the access road network to the Site, including a complete video log.
- 12.5.7 Interrogation of the DfT traffic data portal, which contains both trunk and local road authority traffic count Site data, and Transport Scotland's National Traffic Data System indicates that

there is limited baseline traffic data coverage of the proposed initial Study Area. The available count points are summarised in **Table 12.1: Baseline Traffic Census Count Points**, below.

Table 12.1: Baseline Traffic Census Count Points

Count Point Reference	Location
ATC00301	A90 PITRODDIE
JTC00152	A90 INCHMARTINE - SW OF B953

- 12.5.8 It is recognised that additional baseline traffic survey data collection will be required to inform the assessments. The extent of the Study Area will be agreed with PKC and TS prior to assessment once a proposed access strategy and access locations are confirmed. Data collection requirements will be agreed through consultation with the PKC Roads Department and TS.

Assessment Methodology

- 12.5.9 In accordance with the ISEP guidelines, the method used for assessing environmental effects of increased traffic will be based on a comparison in percentage terms between predicted traffic flows on potentially affected roads with and without the Proposed Development traffic. The ISEP guidelines express two 'rules' which should be followed when determining the scale and extent of the assessment, these are:
- "Rule 1: include highway links where traffic flows would increase by more than 30% (or the number of heavy goods vehicles would increase by more than 30%); and*
- Rule 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more".*
- 12.5.10 Rules 1 and 2 will be used as a screening tool to determine if a full assessment of routes within the Study Area is required due to the level of increase in traffic flows. In the case of construction traffic, where it is anticipated that traffic volumes do not increase by more than 30% (or 10% in sensitive locations) then a detailed assessment of the effects is not deemed necessary.
- 12.5.11 During construction, activities will generate traffic resulting in potential impacts on sensitive receptors.
- 12.5.12 Whilst the Site is in a rural location, there are several residential receptors located close to the primary access route. There are a number of residential properties, local businesses along U142, U150, U151 Station Road and U155 with only a small number of these having direct frontage access for example, located close to the carriageway with no driveway/front garden separating them from the road.
- 12.5.13 Significance of effect will be determined using a matrix approach combining a function of the sensitivity of receptors and the magnitude of change. The assessment matrix incorporates information about the importance / sensitivity of the receptor, the magnitude of impact, the duration / persistence of the impact and the likelihood of the impact occurring. The criteria that will be used to categorise sensitivity of the receptor and magnitude impact characteristics will be set out in the Traffic and Transport Chapter of the EIAR.

- 12.5.14 Mitigation measures to reduce the level of any anticipated significant adverse impacts will be described, where necessary.

Sensitivity

- 12.5.15 The potential sensitivity of receptors to change in traffic levels has been determined by considering the Study Area and the presence of receptors in relation to each potential impact.
- 12.5.16 Where the predicted increase in traffic flow resulting from the construction activities exceeds the ISEP thresholds a full assessment of impact would be required. In this context, the ISEP guidelines do not define the value placed on the receptors and therefore their sensitivity; therefore, the assessor makes a professional judgement based on experience and the nature of the Study Area. Each receptor has been assessed individually to determine its sensitivity and the assessment criteria chosen are summarised in **Table 12.2: Sensitivity of Receptor Criteria**, below.

Table 12.2: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Receptor	
	Road Users	Visitors / residents of Properties & Settlements
High	Where the road is a minor rural road, not constructed to accommodate frequent use by heavy goods vehicles (HGV). Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Low	Where the road is Strategic or A-road class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.	Where a location is a small rural settlement, few community or public facilities or services.
Negligible	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for abnormal	Where a location includes individual dwellings or scattered settlements with no facilities.

Sensitivity of Receptor	Receptor	
	Road Users	Visitors / residents of Properties & Settlements
	loads and new strategic road junctions capable of accommodating abnormal loads.	

Magnitude of Impact

- 12.5.17 The ISEP guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development. The impacts and levels of magnitude are discussed below.
- 12.5.18 Based on the ISEP guidelines, the following factors have been identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements. Therefore, these are considered in the assessment which may arise from changes in traffic flows resulting from the Proposed Development:
- 12.5.19 Severance of communities - The perceived division that can occur within a community when it becomes separated by major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
- 12.5.20 Road vehicle driver and passenger delay - Traffic delays impacting non-development traffic can occur at points on the road network surrounding a development Site including Site entrance, roads passing a development Site where there is likely to be additional traffic and the flow might be affected by additional parked cars, key intersections along a road and side roads where the availability of gaps between vehicles to circumvent delay are reduced.
- 12.5.21 Non-motorised user delay - Changes in volume, composition or speed of traffic may affect the ability of people to cross a road. In general, increases in traffic levels are likely to lead to greater increases in delay. This is also dependent on existing level of activity, visibility and general physical conditions of the Site.
- 12.5.22 Non-motorised amenity - Defined as the relative pleasantness of a journey, and is affected by traffic flow, traffic composition and pavement width/separation from traffic.
- 12.5.23 Fear and intimidation on and by road users - ISEP guidelines states that measuring the extent of fear and intimidation because of development traffic is dependent on the following factors:
- The total volume of traffic;
 - The heavy vehicle composition;
 - The speed these vehicles are passing; and

- The proximity of traffic to people - and/or the feeling of the inherent lack of protection created by factors such as a narrow pavement median, a narrow path or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles.

12.5.24 ISEP guidelines suggest defining the degree of hazard to pedestrians in three stages:

- Fear & Intimidation (F&I) Degree of Hazard - By calculating average (a) 18hr total traffic flow, (b) 18hr heavy vehicle flow and (c) average speed (Mph). Each with suggested thresholds of traffic number flows and average vehicle speeds. These thresholds in-turn sort the assessment results into a 'degree of hazard' score of 0-30. This is calculated for baseline traffic flows and baseline + development traffic flows.
- Levels of F&I - Levels of F&I are categorized as: 'Extreme', 'Great', 'Moderate' or 'Small' according to a total hazard score provided by combining the elements of stage 1 - (a)+(b)+(c).
- F&I Magnitude of Impact - The level of impact is then approximated with reference to the changes in the level of fear and intimidation from baseline conditions. Magnitude of impact is categorized according to 'change in step/traffic flows from baseline conditions as:
 - 'high' (two step changes in level);
 - 'medium' (one step change in level with >400 vehicle increase in average 18hr all traffic flow and/or >500 increase in total 18hr HGV flow);
 - 'low' (one step change in level with <400 vehicle increase in average 18hr total vehicle flow and/or <500 HGV flow increase in total 18hr HGV flow); and
 - 'negligible' (no change in step changes).

12.5.25 Road user and pedestrian safety - Consists of an approximation of the potential for road safety impacts through the calculation of collision rates (slight, serious and fatal). Collision clusters are identified by a detailed review of the baseline characteristics to determine the road safety sensitivity of discrete areas of the road network.

12.5.26 Hazardous/large loads - Some developments may involve the transportation of dangerous or hazardous loads by road. Such movements may involve specialist loads that might be involved in the construction or decommissioning phases of the development electrical components).

12.5.27 Magnitude of impact is a product of the existing traffic volumes, the percentage increase and change due to the Proposed Development, change in the type of traffic and the temporal distribution of that traffic.

12.5.28 The thresholds to measure the magnitude of transport related impacts summarised in **Table 12.3: Magnitude of Impact Criteria**, below will be used:

Table 12.3: Magnitude of Impact Criteria

Effect	Magnitude of Impact			
	Negligible	Low	Medium	High
Road Vehicle Driver and Passenger Delay	< 10% Increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels		
Severance of Communities	Changes in total traffic flow of less than 30%	Changes in total traffic flow of 30%-60%	Changes in total traffic flow of 60%-90%	Change in total traffic flow over 90%
Non-Motorised User Delay	< 10 % Increase in traffic	An increase in total hourly traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross a road. Whether or not the increase in traffic results in a significant effect should be determined using professional judgement.		
Non-Motorised Amenity	Assessment of this link is based on a desktop review of non-motorised user facilities on links used by construction traffic.			
Fear and Intimidation of and by road users	Negligible - No change in step changes.	Low - One step change in level, with: <400 vehicles increase in average 18hr all vehicle two-way all vehicle flow; and/or <500 heavy goods vehicle increase in total 18hr HGV flow.	Medium - One step change in level, but with: >400 vehicles increase in average 18hr all vehicle two-way all vehicle flow; and/or >500 heavy goods vehicle increase in total 18hr HGV flow.	High - Two step changes in level.
Road User and Pedestrian Safety	< 10% Increase in traffic	Professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents. Collision cluster analysis is required. A cluster corresponds to a high concentration of accidents in a specific location (for example, a specific junction) within the analysed time frame. In this assessment, a collision cluster = 3 accidents within a 100m radius are assumed where no specific criteria for collision cluster analysis is provided by the respective Local Highway Authority. It should be noted a commonly used criterion is 5 accidents within a 100m radius over a five-year period).		
Hazardous/Large Loads	< 30 % increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels.		

Significance of Effect

- 12.5.29 Sensitivity and magnitude of change as assessed under the detailed criteria will be considered collectively to determine the potential effect and their significance. The collective assessment is an assessment undertaken by the assessor, based on the likely sensitivity of the receptor to the change (for example, is receptor present which would be affected by the change), and then the magnitude of that change. The Significance of Effect is reached by combining the Sensitivity of Receptor against the Magnitude of Impact. This table is used as a guide to determine the level of effect. 'Major' and 'Moderate' effects are considered to be 'Significant' in terms of the relevant guidance set out in DMRB LA104 (Standards for Highways, 2020) which is the basis of the factor-specific significance matrix is summarised in **Table 12.4: Sensitivity of Receptor Criteria** below.

Table 12.4: Sensitivity of Receptor Criteria

	Magnitude of Impact			
Sensitivity of Receptor	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Cumulative Assessment

- 12.5.30 The anticipated cumulative effects of the potential for overlapping construction programmes for the Proposed Development in addition to other development proposals will be considered. The mechanism for mitigation of any cumulative effects is the implementation of a CTMP. It should be noted that a cumulative assessment in relation to transport and traffic is reliant on the prospect of more than one development being under construction (or operation, where this is applicable) at the same time as the Proposed Development.

12.6 Potential Significant Effects

Construction

- 12.6.1 General construction material would need to be transported to the Site in standard Heavy Goods Vehicles (HGVs), leading to a temporary increase in traffic volumes on the surrounding road network. This will be dependent on the Proposed Development construction material quantities required and their source which is unknown at this time and will be confirmed through the ongoing design process. Additionally, this will need to be considered across an 18-24 month construction programme. A small number of trips would also be generated by personnel travelling to Site, which can be mitigated by implementation of a coordinated staff transport strategy via the CTMP and an approved Travel Plan.

12.7 Approach to Mitigation

Primary Mitigation

- 12.7.1 Primary mitigation of Traffic and Transport environmental effects can be achieved through the design and construction planning process, where possible. Examples of such mitigation are the selection of an appropriate Original Equipment Manufacturer (OEM) product technology for the main components, method of delivery, construction methodology, materials used (and their sourcing) and construction programming which will influence the number of additional vehicle movements on the local road network directly related to the construction of the Proposed Development.

Secondary Mitigation

- 12.7.2 An example of such a measure would be stipulating that HGVs to and from the Proposed Development should avoid a specific route or specific times of day. The need for such mitigation will be identified through the assessment and summarised in a CTMP. The EIAR will include a summary of measures that could be included in a CTMP and the submission of a full CTMP could be made a condition of any consent granted for the Proposed Development.
- 12.7.3 Another example is a Wear and Tear Agreement, under Section 96, Road (Scotland) Act, (which may include the provision of a Road Bond to the Local Authority) and would cover extraordinary costs associated with abnormal wear and tear on routes that will be used by construction traffic, in particular by HGVs, particularly where it has been determined that a specific road is not suitable for continuous use by HGVs. The pre-construction condition of any route being used will be surveyed and recorded. During construction activities, a road wear and tear review would be undertaken with the relevant Road Authority concerned at an agreed interval. Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

Tertiary Mitigation

- 12.7.4 Tertiary mitigation measures would include standard practices that are commonly implemented by contractors. Examples of such mitigation are voluntary speed limits for HGVs when passing through settlements along construction routes, the sheeting of loads to control dust, and wheel washing to prevent mud and debris being deposited on the public road.

12.8 Matters Scoped Out

Operation

- 12.8.1 Apart from occasional maintenance visits to service the Proposed Development, the operational phase is not considered to introduce a significant increase in traffic. It is therefore considered that no significant effects will arise during the operational phase and therefore the operational phase is **scoped out** of further assessment.

Decommissioning

- 12.8.2 The levels of traffic associated with decommissioning are anticipated to be lower than those required during the construction phase, therefore will have a reduced impact compared to that assessed for construction phase.

12.9 Questions to Consultees

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed Study Area?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the identification of what constitutes the baseline environment is appropriate and that all relevant receptors have been identified?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree that all potential impacts have been identified?
- Do you agree with the proposed factor-specific assessment approach?
- Do you agree with the proposed cumulative assessment approach?

12.10 References and Guidance

- Highways England et al. (2020). Design Manual for Roads and Bridges: LA103 Scoping for Environmental Assessment (Revision 1). Available at: <https://www.standardsforhighways.co.uk/search/fb43a062-65ad-48d3-8c06-374cfd3b8c23>.
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- ISEP formerly Institute of Environmental Management and Assessment (2023). Environmental Assessment of Traffic and Movement. PDF.
- Transport Scotland (2012). Transport Assessment Guidance. Available at: https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management_dpmtag_ref_17_-_transport_assessment_guidance_final_-_june_2012.pdf

13 CARBON AND CLIMATE

13.1 Introduction

- 13.1.1 This chapter of the Environmental Impact Assessment Scoping Report (EIASR) presents the scope of the environmental impact assessment for carbon and climate for the Proposed Development. Specifically, this section of the EIASR presents for this topic the policy and legislative context, the approach to collecting baseline data and an overview of the relevant baseline conditions within the Site and surrounding area. It also sets out the scope of assessment including, with justification, those effects that are proposed to be scoped in or out for detailed assessment, and then concludes by outlining the method that will be used to undertake the detailed environmental assessment. The assessment with regards to carbon and climate comprises both the impacts of climate change on the Proposed Development, in the form of a climate change risk assessment, as well as the impact of the Proposed Development on the climate, in the form of a greenhouse gas (GHG) assessment.

13.2 Legislation Policy and Guidance

- 13.2.1 Legislation, planning policy and guidance relating to carbon and climate and relevant to the Proposed Development comprises:

Legislation

- The Climate Change Act 2008 (as amended by the Climate Change Act (2050 Target Amendment Order 2019); Budget Order 2009;
- The Carbon Budget Order 2011;
- The Carbon Budget Order 2016
- The Carbon Budget Order 2021;
- Energy Act 2023;
- Scottish Climate Change Plan (2018); and
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019;
 - 56% reduction in emissions by 2020;
 - 75% reduction in emissions by 2030; and
 - 90% reduction in emissions by 2040.

National Planning Policy

- Overarching National Policy Statement for Energy (NPS EN-1) (2023) (designated January 2024);
- British Energy Security Strategy (Department for Business, Energy & Industrial Strategy, and Department for Energy Security & Net Zero, 2022);
- Energy White Paper: Powering our Net Zero Future (2020);
- Powering Up Britain (2023);

- Net Zero Strategy: Build Back Greener (2021);
- The Ten Point Plan for a Green Industrial Revolution (2020);
- The Clean Growth Strategy (2017);
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023) (designated January 2024);
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (designated January 2024);
- National Planning Policy Framework (NPPF) (updated February 2025);
- Scottish Climate Change Adaptation Programme (SCCAP) (2019); and
- Scottish Planning Policy (2014).

Local Planning Policy

- Perth & Kinross Climate Action Plan (2021);
- Perth and Kinross Council Local Area Energy Plan 2024-2029 (2024); and
- Errol Local Place Plan (2025).

Guidance

- Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management and Assessment (IEMA, 2022),
- Assessing Climate Change Resilience and Adaptation ((Institute of Environmental Management and Assessment (IEMA, 2020);
- Planning Practice Guidance on Climate Change (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities, 2019);
- A Corporate Accounting and Reporting Standard (The Greenhouse Gas Protocol, 2004); and
- Whole Life Carbon Assessment for the Built Environment (Royal Institution of Chartered Surveyors, 2023).

13.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 13.3.1 This section of the Scoping Chapter for carbon and climate sets out the known baseline conditions at this (scoping) stage of the Proposed Development.

Approach to Collection of Baseline Data

- 13.3.2 Site information used to inform the baseline conditions for scoping in **Paragraph 13.3.7** is expanded upon in **Chapter 2: Project Description**.

- 13.3.3 Data pertaining to the expected construction and operational activities will be sourced from the Applicant to estimate applicable direct and indirect emissions. This includes construction energy consumption, expected maintenance requirements, product specification (for example, solar PV modules, substation components), total materials needed for construction and details on construction workforce.
- 13.3.4 Potential GHG savings as a result of the operation of the Proposed Development will be calculated through a comparison against the emission intensity of alternative energy sources including:
- the national grid electricity emissions factors;
 - the most carbon-efficient fossil fuelled technology currently available; and
 - comparable renewable technologies.
- 13.3.5 Flood risk within the Site boundary to date has been informed using the Scottish Government's SEPA Flood Maps tool (2026), which ranks an area's flood risk probability from different sources as either 'Low Likelihood' (0.1% chance of river flooding annually), 'Medium Likelihood' (0.5% chance of river flooding annually), or 'High Likelihood' (10% chance of river flooding annually). See **Chapter 9: Soils, Geology and Water including Flood Risk** for more detail.
- 13.3.6 Baseline data or climatic conditions within the Site boundary would be sourced from UK MET Office (2026) historical location-specific long-term climate averages from the closest climate station.
- Relevant Baseline Conditions**
- 13.3.7 The baseline, including Potential Additional Options and Indicative Underground Cable Route Corridors, comprises existing carbon stock and sources of GHG emissions within the Site boundary of the existing activities on-site.
- 13.3.8 The land within the Site boundary predominantly consists of agricultural and grazing fields. Ditches, Pows, and field margins form the boundaries to many of the fields within the Site boundary, with further sporadic areas of hedgerows and trees, see **Chapter 2: Project Description** for a detailed description of the Site and surrounding context.
- 13.3.9 The national GHG baseline is also important to understand. The Climate Change Committee is an independent statutory body established under the Climate Change Act 2008 to advise the UK Government and Devolved Administrations on reducing GHG emissions and preparing for climate change. The Climate Change Committee undertakes an annual assessment of GHG emissions to determine whether the UK is on course to meet its target carbon budget.
- 13.3.10 In its most recent budget report (released in February 2025), the Climate Change Committee recommended that the UK set a Seventh Carbon Budget which requires a reduction in emissions of 87% by 2040, relative to 1990 levels. This represents a world-leading commitment which is consistent with the over-arching objectives of the 2015 Paris Agreement. Under the Climate Change Act 2008, the UK Government is required to legislate for the Seventh Carbon Budget by 30 June 2026.

- 13.3.11 According to SEPA Flood Maps (2026), the Site boundary is primarily in High Likelihood and Medium Likelihood flood zones, showing the Proposed Development has a risk of between 0.5% and 10% chance of surface water flooding and river flooding annually. For further detail on the proposed hydrology and hydrogeology assessments for the Proposed Development, please refer to **Chapter 9: Soils, Geology and Water including Flood Risk**.

Potential Sources of Impact

- 13.3.12 The sensitive receptor for GHG emissions is the global atmosphere, which, by proxy, can be extended to the United Kingdom's (UK) commitments under the UK Climate Change Act 2008 (2050 Target Amendment) Order 2019, which is aligned with the global goals of the 2015 Paris Agreement (avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C).
- 13.3.13 In line with IEMA (2022) guidance, the global atmosphere, as a receptor, has "*a high sensitivity, given the severe consequences of global climate change and the cumulative contributions of all GHG emissions sources*".
- 13.3.14 The sensitive receptor relevant to the climate change risk assessment is the Proposed Development.

Design Considerations

- 13.3.15 Consideration would be paid to the opportunity to introduce environmental measures that would help to avoid or reduce the potential for an adverse significant effect to occur. In accordance with Schedule 4(7) of the EIA Regulations, the Environmental Impact Assessment Report (EIAR) would be based on an EIA mitigation hierarchy which seeks to avoid, prevent, reduce, and offset (where appropriate) likely significant effects. Specific environmental measures relevant to climate would be identified and would be considered as part of the assessments (for example, the assessments of likely significant effects have been undertaken with the inclusion of the environmental measures, as these measures would form part of the Proposed Development). At this stage of the project, the environmental measures covered in **Section 13.7 Approach to Mitigation** would be considered for implementation to be included within the Proposed Development.

13.4 Consultation

- 13.4.1 No consultation has been undertaken to date in relation to carbon and climate.

13.5 Survey and Assessment Methodology

Study Area

- 13.5.1 The GHG assessment will consider GHG emissions from within the Site and those indirect emissions from activities outside the Site.
- 13.5.2 The scope of the GHG assessment includes the addition of GHG emissions directly from construction, operation and maintenance, and decommissioning activities undertaken within the Site, including fuel consumption. It also includes indirect emissions which would occur

outside the Site boundary, but related to the activities of all stages of the Proposed Development, including, as an example, those from:

- the extraction, manufacture, and transportation of construction products and materials to the Site;
- the transportation of workers to the Site; and
- off-site transportation and disposal of waste.

- 13.5.3 These emissions will be estimated based upon project-specific data that may relate to activities outside the Site boundary (for example, water provision and wastewater treatment outside of the Site boundary, transport of materials to the Proposed Development or the embodied carbon within construction materials, which would include the emissions associated with raw material extraction, transport to the manufacturing site and manufacturing emissions).

Climate Change Risk

- 13.5.4 As the climate change risk assessment is an assessment of the impact of the effects of climate change on the Proposed Development over its entire lifetime, the study area will be the area defined by the Site boundary.

Surveys

- 13.5.5 No surveys have been undertaken to date, and none are expected to be undertaken to inform the carbon and climate assessment.

Assessment Methodology

- 13.5.6 The assessment of the effects of GHG emissions arising from the Proposed Development will be carried out in accordance with:
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022);
 - Royal Institute of Chartered Surveys (RICS) Whole life carbon assessment for the built environment (2023);
 - Planning Practice Guidance on Climate Change (Ministry of Housing, Communities and Local Government and Department for Levelling Up, Housing and Communities, 2019); and
 - A Corporate Accounting and Reporting Standard (The Greenhouse Gas Protocol, 2004).
- 13.5.7 The assessment will quantify applicable Kyoto Protocol GHGs as measured in tonnes of carbon dioxide equivalence (tCO₂e), where equivalence means having the same warming effect as CO₂ over 100 years. The seven Kyoto Protocol gas groups are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆), perfluorocarbons (PFCs) and nitrogen trifluoride (NF₃).
- 13.5.8 The GHG baseline characterisation will be conducted using a desk-based assessment of current land use, existing carbon stock and any activities that could cause GHG emissions. However, in line with IEMA Guidance (2022), any agricultural land can generally be considered to have zero baseline emissions to ensure a reasonable worst-case approach to establishing net GHG effect.

- 13.5.9 Data associated with the activities contributing to the construction, operation and decommissioning of the Proposed Development will be provided by the Applicant and technical specialists. Where it is not possible to collect this data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks and proxy data such as distance travelled) will be used. Emissions will then be quantified by applying the most relevant and up-to date emission factors.
- 13.5.10 Lifecycle GHG emissions associated with the Proposed Development will be reported using the modular structure as outlined in Royal Institution of Chartered Surveyors (2023) guidance. The reporting modules are defined as follows, with 'A' modules corresponding to construction phase emissions, 'B' modules corresponding to operation phase emissions, and 'C' modules corresponding to decommissioning phase emissions:
- **A1-3 product stage** – this category includes the embodied emissions of materials used to construct the Proposed Development. It includes the emissions associated with raw material extraction, transport to the manufacturing site and manufacturing emissions;
 - **A4 transport** – this comprises the emissions associated with the transport of materials from the manufacturing site to the construction site;
 - **A5 construction and installation** – this source includes four sub-categories which include emissions from pre-construction demolition (if applicable), construction activities (such as equipment fuel use), material wastage and construction worker transport;
 - **B1 in-use emissions** – emissions associated with refrigerant gas leaks (if applicable) and emission release from products or reabsorption into products (such as sequestration from timber);
 - **B2-5 maintenance, repair, replacement and refurbishment** – this includes emissions associated with routine maintenance (B2), repair (B3), replacement of materials (B4) and any planned refurbishment (B5);
 - **B6 operational energy** – energy used during the operation of the asset;
 - **B7 operational water** – water used during the operation of the asset;
 - **B8 user activities not covered in B1-7** – emissions may include transport of persons to and from the asset during operation, for example; and
 - **C1-4 end of life** – this category includes deconstruction and demolition emissions (C1), transport of waste materials from the Site to disposal sites (C2), waste processing for recycling (C3) and disposal emissions from landfill (C4).
- 13.5.11 Given the international urgency of climate change, the sensitivity of the receptor (the global atmosphere) to fluctuations in GHG emissions is considered 'Very High'. Thus, the level of the significance of effects is determined by the magnitude, and timing, of GHG emissions and the likelihood of avoiding severe climate change.
- 13.5.12 Aligned with IEMA Guidance (2022), any project that causes GHGs to be avoided, or removed from the atmosphere, has a beneficial effect that is always significant. In such a scenario, the Proposed Development substantially exceeds the national net zero requirements and is thus aligned with the goal of the Paris Agreement to limit temperature rise to well below 2°C, aiming for 1.5°C.
- 13.5.13 The significance of the GHG impacts of the Proposed Development on the climate will be determined by assessing the magnitude of emissions against both national and sectoral carbon budgets. On 24 June 2026, Parliament passed the 7th carbon budget (2038-2042)

into law in line with the CCC's advice. Where carbon budgets are not available for certain assessment periods, a qualitative approach will be taken.

- 13.5.14 The renewable electricity from the Proposed Development is directly replacing that generated by fossil-fuel energy. Consequently, the GHG emissions savings from the operation of the Proposed Development will be assessed based upon a comparison of operational emissions per kWh energy generation against those from a gas-fuelled power station.
- 13.5.15 To assess the GHG savings of the Proposed Development, operational emissions from a Combined Cycle Gas Turbine will be used as a comparison, as it is currently the most carbon-efficient fossil-fuelled technology available. This will be supplemented with additional comparisons including against current UK grid electricity as well as alternative forms of renewable energy. Carbon payback periods will be presented against the whole lifecycle of the Proposed Development, as well as against operational emissions only.

Sensitivity

- 13.5.16 The sensitive receptor for GHG emissions is the global climate, which is considered highly sensitive to GHG fluctuations. By proxy, this can also be extended to the United Kingdom's (UK) commitments under the UK Climate Change Act 2008 (2050 Target Amendment) Order 2019, which aligned with the goals of the 2015 Paris Agreement, to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

Significance of Effect

- 13.5.17 The magnitude of impact is determined by applying the relevant criteria as outlined in **Table 13.1**.

Table 13.1: Magnitude of Impact Criteria

Significance	Level	Criteria
Significant	Major adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the 2015 Paris Agreement (i.e. a science-based 1.5°C trajectory). GHG impacts are not mitigated or reduced in line with local or national policy for projects of this type.
	Moderate adverse	Project's GHG impacts are partially mitigated, and may partially meet up-to-date policy; however, emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the 2015 Paris Agreement.
Not Significant	Minor adverse	Project may have residual emissions, but the project is compatible with the goals of the 2015 Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the 2015 Paris Agreement, complying with up to-date policy and best practice.

Significance	Level	Criteria
Significant	Beneficial	Project causes GHG emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a beneficial climate impact.

Cumulative Assessment

- 13.5.18 In accordance with the IEMA (2022), “All global cumulative GHG sources are relevant to the effect on climate change, and this should be taken into account in defining the receptor (the atmospheric concentration of GHGs) as being of ‘high’ sensitivity to further emissions. Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other.” Therefore, a detailed cumulative assessment is not proposed to be undertaken.

13.6 Potential Significant Effects

GHG Emissions

Construction

- 13.6.1 GHG emissions will be inevitable during the construction phase. Main GHG emissions sources are likely to be through fuel consumption and the embodied GHG emissions of materials.
- 13.6.2 It is not expected that the GHG emissions from construction will compromise the ability of the UK and Scotland to meet their carbon reduction targets. However, in view of the cumulative contribution of all emissions towards climate change, and the fact that the global atmosphere is highly sensitive to fluctuations in GHG emissions, the GHG emissions associated with the construction of the Proposed Development will have an adverse effect upon the climate.
- 13.6.3 It should be noted however that the effects of individual project phases, particularly in the context of renewable energy developments, are not usually viewed in isolation due to the intended beneficial impact of the operation of the Proposed Development. Furthermore, the adverse effects of the construction phase regarding GHG emissions will be reduced through design mitigation measures.

Operation

- 13.6.4 While it is acknowledged that the operation and maintenance of the Proposed Development, including Potential Additional Options and Indicative Underground Cable Route Corridors, will result in emissions (for example through operational energy use, maintenance worker travel, repair and replacement of components), it is unlikely to contribute a significant amount of GHG emissions and is expected to achieve GHG emissions savings by offering additional renewable electricity generation in place of fossil fuel electricity generation. GHG emissions savings will persist for the entirety of the Proposed Development’s lifespan and will contribute cumulatively towards GHG reduction targets set both locally and nationally. The GHG savings from the operation and maintenance phase are anticipated to be greater than the GHG emissions associated with the construction and decommissioning phases, and will

contribute to the decarbonisation of the National Grid, which would constitute a beneficial and significant effect on climate.

Decommissioning

- 13.6.5 GHG emissions will be inevitable during the decommissioning phase, again due to the necessary use of heavy machinery, the disposal of waste materials, and the transportation of workers. As is the case with construction, the receptor is not confined to the immediate vicinity of the Site; instead, it is the global atmosphere. As such, the receptor is highly sensitive, in view of the cumulative contribution of all emissions towards climate change. With this in mind, the GHG emissions associated with the decommissioning of the Proposed Development, including Potential Additional Options and Indicative Underground Cable Route Corridors, will have an adverse effect upon the climate.
- 13.6.6 It should be noted however that the effects of individual project phases, particularly in the context of renewable energy developments, are not usually viewed in isolation due to the intended beneficial impact of the operation of the Proposed Development, including Potential Additional Options and Indicative Underground Cable Route Corridors. Furthermore, the adverse effects of the decommissioning phase regarding GHG emissions will be reduced through design mitigation measures.

13.7 Approach to Mitigation

GHG Emissions

Construction

- 13.7.1 An Outline Construction Environmental Management Plan (oCEMP) will be submitted in support of the Section 36 (S36) consent application which will detail good working practices in line with appropriate standards, including low carbon practices. Some mitigation measures which will be investigated in order to determine their feasibility are:
- Where technical specifications allow, maximise the recycled content of construction materials such as concrete and steel;
 - Maximise the specification of materials with an environmental product declaration with the aim of reducing embodied carbon emissions through the greater level of transparency and data quality provided by an environmental product declaration;
 - On-site mobile and non-mobile plant should conform to the latest emissions standards, with mobile vehicles conforming to EURO 6 standards as a minimum. All plant should investigate the option of using Hydrotreated Vegetable Oil fuels or electric versions where possible; and
 - Require main contractors to report on electricity and fuel consumption, water usage and waste disposal and their GHG emissions.

Operation

- 13.7.2 Given the nature of the Proposed Development as a renewable energy project, it is anticipated to have an overall beneficial effect on the climate with regards to GHG emissions. Despite this, adherence to best practice relating to the maintenance and replacement of components of the Proposed Development would be followed at all times. Any replacement and maintenance which takes place would also follow the mitigation measures proposed

within the construction phase (where applicable). Additional mitigation measures for the operation and maintenance phase will be detailed in the EIAR.

Decommissioning

- 13.7.3 The decommissioning process is likely to result in GHG emissions, particularly from waste disposal of solar PV modules. Mitigation measures will be employed that align with the hierarchy for managing project-related emissions (avoid, reduce, substitute, and compensate). Mitigation measures for the decommissioning phase will be addressed in the EIAR.

Climate Risk

Construction

- 13.7.4 UK Climate Projections (2018) (UKCP18) suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (for example, heat waves, high rainfall events) and sea-level rise. Electrical infrastructure is anticipated to be sited in locations at low risk of flooding or set at the necessary minimum ground levels.
- 13.7.5 An oCEMP will be submitted in support of the S36 consent application which will detail measures to decrease the risk of climate hazards on the construction phase. Some measures which will be investigated in order to determine their feasibility include:
- Weather forecasts to be monitored on a daily basis. Forecasts will be used to inform the sequencing of activities and the use of appropriate personal protective equipment;
 - Provision of welfare facilities including breaks, shade, and hydration facilities, as well as first aid amenities;
 - Provision of an Emergency Response Plan, to include on-site fire prevention, suppression, and evacuation procedures;
 - Provision of an Incident Response Plan that identifies flooding as a key site risk and identifies the correct policies and procedures to follow in the event of such;
 - Monitoring and maintenance of plant and equipment to ensure compliance of machinery with design specifications and flexibility in the construction activities programme to account for climatic variation;
 - Appropriate on-site storage of plant and equipment; and
 - Hazardous materials will be maintained in a safe storage area when not in use. This will be away from site access and egress points. Disposal of hazardous waste will be undertaken appropriately, taking into account the risks associated with high temperatures and increased rainfall.

Operation

- 13.7.6 The condition and integrity of components of the Proposed Development will be regularly assessed, and maintenance undertaken as early as required, considering materials with

enhanced tolerance to fluctuating temperatures and exposure to rainfall. These measures will be detailed in the EIAR.

Decommissioning

- 13.7.7 Anticipating the most appropriate additional mitigation measures to be implemented during the decommissioning stage is difficult due to the potential advancements in technology and best practice between the present and the time in which decommissioning will take place. Despite this, general adherence to the additional mitigation measures proposed during the construction phase is advised. These measures will be detailed in the EIAR.

13.8 Matters Scoped Out

Receptor/matter	Phase	Area	Justification
Climate Change Risk	Construction, operation and decommissioning	Halfway Energy Park Site Boundary	UK Climate Projections (2018) (UKCP18) suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (for example, heat waves, high rainfall events) and sea-level rise. Due to the embedded resilience of the primary components within a solar renewable development (solar PV modules, substations, inverters, transformers, Battery Energy Storage System (BESS), switchgears) to high heat, extreme rain, and wind speeds, these factors are not expected to significantly impact on the construction, operation and maintenance or decommissioning of the Proposed Development. Electrical infrastructure (solar PV modules, substations, inverters, transformers, BESS and switchgear) is anticipated to be sited in locations at low risk of flooding and/or set at the necessary minimum ground levels determined by the Flood Risk Assessment and in agreement with the relevant prescribed consultees. The vulnerability of the Proposed Development to sea level rise, flooding, and its potential to exacerbate flooding is scoped out of this chapter because it will be covered in more technical detail in the stand-alone Flood Risk Assessment to be submitted in support of the S36 consent application. See Chapter 9: Soils, Geology and Water including Flood Risk for more detail. The Flood Risk Assessment will, by nature, take into account the impact of

Receptor/matter	Phase	Area	Justification
			climate change risk with regards to flooding on the Proposed Development. It is not anticipated that climate change will present a significant risk to human health or vegetation, within the context of the Proposed Development.
In-combination impact assessment	Construction, operation and decommissioning	Halfway Energy Park Site Boundary	The resilience of all receptors identified in other chapters are unlikely to be significantly affected by a combination of future climate change (for example, temperature change, sea level rise, or wind), and the impacts of the Proposed Development. Given some sections of the Site boundary are located within 'High Likelihood' flood risk zones, the potential in-combination impacts of heavy precipitation, and the Proposed Development would be assessed in more technical detail within the Flood Risk Assessment, to be submitted in support of the S36 consent application. See Chapter 9: Soils, Geology and Water including Flood Risk, for more detail.

13.9 Questions to Consultees

- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?

13.10 References and Guidance

- The Paris Agreement (2015) Available online: <https://unfccc.int/process-and-meetings/the-paris-agreement> [Accessed 11/11/2025]
- United Nations Framework Convention on Climate Change (1994) Available online: <https://unfccc.int/> [Accessed 11/11/2025]
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- Department for Energy Security and Net Zero, Prime Minister's Office, 10 Downing Street, Department for Business, Energy & Industrial Strategy, The Rt Hon Lord Alok Sharma KCMG and The Rt Hon Boris Johnson (2020). The Ten Point Plan for a Green Industrial Revolution, Available online: <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution> [Accessed 08/05/2026]
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14 GLINT AND GLARE

14.1 Introduction

- 14.1.1 This chapter of the Environmental Impact Assessment Scoping Report (EIASR) considers the approach to the assessment of likely significant effects of Glint and Glare as a result of the Proposed Development during its construction, operation and decommissioning phases, with particular focus on residential amenity, road safety, railway operations and infrastructure, and aviation safety.
- 14.1.2 Glint and Glare is defined as follows:
- Glint – a momentary flash of bright light (typically experienced by moving receptors); and
 - Glare – a continuous source of bright light (typically experienced by static receptors).
- 14.1.3 The term ‘solar reflection’ is used to refer to both reflection types i.e. Glint and Glare.

14.2 Legislation Policy and Guidance

Legislation and Policy

- 14.2.1 This Glint and Glare chapter has considered the National Planning Framework (NPF) 4, published February 2023. The NPF4 states that proposals for all forms of renewable, low-carbon and zero emissions technologies (including solar arrays) will be supported, but does not provide any further detail pertaining to the methodology or consideration to glint and glare from solar panels. Legislation and policy is available within the wider UK and provides further best practices pertaining to glint and glare, as outlined by the National Policy Statement (NPS) EN-3.
- 14.2.2 NPS EN-3 (para 2.10.94) states that “*Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths).*”
- 14.2.3 Neither NPF4 nor NPS EN-3 state which receptors should be considered as part of a quantitative glint and glare assessment. Based on Pager Power’s industry experience and professional judgment, typical receptors include residential dwellings, road users, railway infrastructure, and air traffic control towers and pilots on approach to runways (aviation activity).

Guidance

- 14.2.4 There is no existing planning guidance for the assessment of solar reflections from Photovoltaic (PV) panels towards roads and nearby dwellings.
- 14.2.5 There is railway guidance with respect to signal sighting (for example Rail Industry Standard for Signal Sighting Assessment Requirements); however, no guidance with respect to glint and glare from PV panels and railway infrastructure has been specifically produced.

- 14.2.6 Guidelines exist in the UK (CAST Aerodrome Safeguarding Guidance Note supported by the Civil Aviation Authority) with respect to solar developments and aviation activity. The UK CAA guidance is relatively high-level and does not prescribe a formal methodology.

14.3 Baseline and Potential Sources of Impact

Existing Baseline Conditions

- 14.3.1 The Proposed Development Site, as shown in **Figure 2.2**, is an area of predominantly lowland agricultural farmland approximately 11km east of Perth and 9km southwest of Dundee, broadly between the settlements of Inchtute, Errol and Rait. It is dissected by parallel 275kV and 132kV overhead transmission lines between Dundee and Abernethy substation.
- 14.3.2 The Site is also bisected by the A90 trunk road and railway running between Perth and Dundee. In addition to the A90, the local road network serves the land parcels on a local level.
- 14.3.3 The closest railway line is located adjacent to Adair - North Grange Farm Field Parcels K09, K10 and K11.
- 14.3.4 Dundee Airport and Perth Scone Airport are located approximately 9.6km east and 9.1km west respectively of the Proposed Development.

Potential Sources of Impact

- 14.3.5 Solar reflections towards identified receptors are possible from the PV panels. Potential sources of impact for road users occur when solar reflections are predicted within a road user's primary field-of-view, defined as 50 degrees either side of the direction of travel.
- 14.3.6 Potential sources of impact for residential receptors i.e. dwellings, occur when solar reflections are predicted for more than three months per year and/or occur for more than 60 minutes on any given day.
- 14.3.7 Potential sources of impact for train drivers and railway operations occur when solar reflections are predicted within a train driver's primary field-of-view, defined as 50 degrees either side of the direction of travel during a section of high workload for a train driver (i.e. when observing a signal, at a railway crossing or at a station).
- 14.3.8 Potential sources of impact for aviation receptors (pilots on approach to land at runways) occur when the glare intensity is greater than the typically acceptable threshold of glare intensity, or occurs towards an Air Traffic Control Tower in an operationally-sensitive area.

Design Considerations

- 14.3.9 Design considerations relevant to Glint and Glare are likely to include:
- the configuration of panels (namely, the tilt angle above the horizontal and azimuth angle) to avoid direct effects, or to minimise the duration of effects;

- design to comply with the acceptable thresholds of glare intensity of aviation receptors; and
- informed understanding of specific operations at Dundee Airport and Perth Scone Airport to minimise direct effects.

- 14.3.10 Any predicted impact towards the ground-based receptors (roads and dwellings) can likely be solved with relatively simple mitigation strategies – the most common being the provision of screening at the Site perimeter to obstruct views of potentially reflecting panels. Where views of reflecting panels are obstructed, no effects can be experienced.
- 14.3.11 For significant effects towards aviation receptors, other solutions such as layout modifications can be considered, but are rarely required in practice. Considering the relative location of the Proposed Development with respect to Dundee Airport and Perth Scone Airport as identified, it is unlikely to be required.

14.4 Consultation

- 14.4.1 To date, no consultation has been undertaken with respect to Glint and Glare.
- 14.4.2 Following the impact assessment of potential Glint and Glare effects, consultation may be carried out as part of the Environmental Impact Assessment (EIA) with relevant stakeholders, including but not limited to:
- The local planning authority;
 - Transport Scotland;
 - Network Rail;
 - Aerodromes/Airports and their safeguarding teams.

14.5 Survey and Assessment Methodology

Surveys

- 14.5.1 To date, no Site survey has been undertaken.
- 14.5.2 The glint and glare assessment is desk-based, and utilises resources such as Digital Terrain Models and published data to undertake the assessment.
- 14.5.3 Receptors such as roads and residential dwellings are identified from aerial imagery. Railway infrastructure and assets are identified from aerial imagery and Network Rail's Automated Intelligent Video Review (AIVR).
- 14.5.4 Receptors such as aerodromes and sensitive receptors (i.e. Air Traffic Control (ATC) Towers) are identified from aerial imagery, aeronautical publications and resources available to pilots (i.e. Pooley's flight Guide and SkyDemon).

Assessment Methodology

- 14.5.5 Pager Power's Glint and Glare guidance (2022) provided in **Appendix 14.1** details Pager Power's methodology for undertaking technical assessment of Glint and Glare effects, including study areas, identification of receptors, impact determination, and mitigation requirements. The Glint and Glare assessment will be carried out in accordance with this guidance document.
- 14.5.6 There is no formal guidance with regard to the maximum distance at which Glint and Glare should be assessed. From a technical perspective, there is no maximum distance for potential reflections. However, the significance of a solar reflection decreases with distance. This is because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. In most instances, terrain and shielding by vegetation are also more likely to obstruct an observer's view at greater distances.
- 14.5.7 A 1km assessment area is considered appropriate, informed by Pager Power's Glint and Glare guidance, assessment methodology, and industry experience, when identifying ground-based receptors (roads and dwellings) surrounding the Proposed Development.
- 14.5.8 As a railway line is identified within 100m of the PV panel areas, a technical assessment is required for railway receptors (train driver locations and railway signals) within a 500m assessment area. This assessment area size is deemed appropriate when identifying railway receptors and infrastructure as the significance of a reflection decreases with distance, because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. This study area is typically accepted by Network Rail.
- 14.5.9 There is also no formal guidance with regard to the maximum distance at which aviation effects must be modelled. However, in practice, concerns are most often raised for developments within 10km of a licensed aerodrome. An assessment range of 5km for unlicensed general aviation aerodromes and 10km for licenced aerodromes is considered appropriate based on industry experience and professional judgment.
- 14.5.10 Pager Power's approach is to undertake geometric reflection calculations and, where a solar reflection is predicted, consider the screening (existing and/or proposed) between the receptor and the reflecting PV panels/ façades. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available PV panel reflection studies to determine the overall impact. Further details regarding the Assessment Methodology is outlined in the **Assessment Methodology** section below. The matrix tables to confirm sensitivity, magnitude and significance of effect are provided in **Tables 14.1 to 14.3**.

Sensitivity

Table 14.1: Sensitivity of Receptor Criteria

Sensitivity of Receptor	Criteria
High	Receptors with low capacity to experience solar reflections without fundamentally reducing safety or amenity.

Sensitivity of Receptor	Criteria
Medium	Receptors with medium capacity to experience solar reflections without significantly reducing safety or amenity.
Low	Receptors with a high capacity to experience solar reflections without reduction to safety or amenity.
Negligible	Receptors can experience solar reflections without reduction to safety or amenity.

Magnitude of Impact

Table 14.2: Magnitude of Impact Criteria

Sensitivity of Receptor	Criteria
High	Solar reflection durations / intensities that exceed the maximum allowable levels representing a fundamental safety or amenity impact.
Medium	Solar reflection durations / intensities that exceed the maximum allowable levels, and the glare scenario is considered one which could cause a material safety or amenity impact.
Low	Solar reflection durations / intensities that are within the maximum allowable levels, or where the glare scenario is such that safety or amenity will not be materially impacted.
Negligible	Solar reflections that are not geometrically possible or will not be experienced in practice due to intervening screening.

Significance of Effect

Table 14.3: Sensitivity of Receptor Criteria

	Magnitude of Impact			
Sensitivity of Receptor	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Receptor Sensitivity – Aviation

- 14.5.11 Air Traffic Control Towers are considered **high** sensitivity because they have low capacity to experience solar reflections without a fundamental reduction in safety.
- 14.5.12 Approaching aircraft are considered **medium** sensitivity because they have medium capacity to experience solar reflections without a significant reduction in safety.

Receptor Sensitivity – Railway

- 14.5.13 Train drivers and railway signals/assets are considered **medium** sensitivity because they have medium capacity to experience solar reflections without a significant reduction in safety.

Receptor Sensitivity – Roads

- 14.5.14 To determine the sensitivity of road users, it is relevant to consider that road types can generally be categorised as:
- Major National – Typically a road with a minimum of two carriageways with a maximum speed limit of up to 70mph. These roads typically have fast-moving vehicles with busy traffic;
 - National – Typically a road with a one or more carriageways with a maximum speed limit of up to 60mph or 70mph. These roads typically have fast-moving vehicles with moderate to busy traffic density;
 - Regional – Typically a single carriageway with a maximum speed limit of up to 60mph. The speed of vehicles will vary with a typical traffic density of low to moderate;
 - Local – Typically roads and lanes with the lowest traffic densities. Speed limits vary.
- 14.5.15 Road users along local roads are considered **negligible** sensitivity because they have capacity to experience solar reflections without a reduction to safety.
- 14.5.16 Road users along regional, and national roads are considered **medium** sensitivity because they have medium capacity to experience solar reflections without a significant reduction in safety.
- 14.5.17 Road users on major national roads are considered **high** sensitivity because they have low capacity to experience solar reflections without a fundamental reduction in safety.

Receptor Sensitivity – Dwellings

- 14.5.18 Dwelling receptors are considered **medium** sensitivity because they have moderate capacity to experience solar reflections without a significant reduction to amenity.

Cumulative Assessment

- 14.5.19 The 2.0MW solar farm as part of the mixed-use development (application reference 26/00197/IPM, Perth and Kinross Council) will be assessed cumulatively with the Proposed Development in a separate standalone assessment of Glint and Glare. Given the size and location of the of the 26/00197/IPM solar farm relative to the Proposed Development, a significant cumulative impact is not predicted.

14.6 Potential Significant Effects

Magnitude of Impact – Aviation Activity

- 14.6.1 A **negligible** magnitude of impact would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by a pilot/Air Traffic Control (ATC) personnel.
- 14.6.2 A **low** magnitude of impact would occur under the following scenarios:
- Solar reflections originate from outside a pilot's horizontal field-of-view;
 - The solar reflections have 'low potential for temporary after-image';
 - The solar reflections have 'potential for temporary after-image' with sufficient mitigating factors;
 - The aerodrome has confirmed the level of glare is acceptable.
- 14.6.3 A **medium** magnitude of impact would occur if the solar reflections have 'potential for temporary after-image' without sufficient mitigating factors.
- 14.6.4 A **high** magnitude of impact would occur if the solar reflections have 'potential for permanent eye damage'.

Magnitude of Impact – Railway Operations

- 14.6.5 A **negligible** magnitude of impact would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by a train drivers/towards a railway signal.
- 14.6.6 A **low** magnitude of impact would occur under the following scenarios:
- Solar reflections originate from outside a train driver's horizontal field-of-view;
 - Solar reflections do not present disability glare (for train drivers) or phantom aspect illusion (for train signals);
- 14.6.7 The glare scenario does not present a significant impact with sufficient mitigating factors;
- The railway operator has confirmed the level of glare is acceptable.
- 14.6.8 A **medium** magnitude of impact would occur if the solar reflections occur within a train driver's field-of-view with sufficient mitigating factors, and the glare scenario remains significant.
- 14.6.9 A **high** magnitude of impact would occur if the solar reflections occur within a train driver's field-of-view without sufficient mitigating factors, and the glare scenario remains significant.

Magnitude of Impact – Road Users

- 14.6.10 A **negligible** magnitude of impact would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by a road user.
- 14.6.11 A **low** magnitude of impact would occur if solar reflections were experienced from outside a road user's primary horizontal field of view (50 degrees either side of the direction of travel), or inside of road user's primary horizontal field-of-view with sufficient mitigating factors.
- 14.6.12 A **medium** magnitude of impact would occur if solar reflections were experienced from within a road user's primary horizontal field of view without sufficient mitigating factors.
- 14.6.13 A **high** magnitude of impact would occur if solar reflections were experienced from directly in front of a road user's direction of travel with no mitigating factors.

Magnitude of Impact – Dwellings

- 14.6.14 A **negligible** magnitude of impact would occur if solar reflections are not geometrically possible, or are not predicted to be experienced in practice within a dwelling.
- 14.6.15 A **low** magnitude of impact would occur if solar reflections were experienced for less than three months per year and for less than 60 minutes on any given day, or if solar reflections exceeded one of the thresholds with sufficient mitigating factors.
- 14.6.16 A **medium** magnitude of impact would occur if solar reflections were experienced for more than three months per year or for more than 60 minutes on any given day without sufficient mitigating factors.
- 14.6.17 A **high** magnitude of impact would occur if solar reflections were experienced for more than three months per year and for more than 60 minutes on any given day.

14.7 Approach to Mitigation

- 14.7.1 The approach to mitigation will be through embedded design mitigation. Mitigation options include reconfiguring panels, such as changing the tilt and azimuth angles of panels to reduce glare intensity or duration of solar reflections.
- 14.7.2 It is anticipated that mitigation options for effects to ground-based receptors would include screening and design changes, such as the panel tilt and orientation.
- 14.7.3 It is anticipated that mitigation for effects to non-ground-based receptors (i.e. aviation receptors) would be through design changes.
- 14.7.4 If required, the mitigation above could be employed to mitigate significant effects.

14.8 Matters Scoped Out

- 14.8.1 As noted in **Paragraph 14.2.2** PV modules are specifically designed to absorb light rather than reflect it. Light reflected from PV modules results in the loss of energy output. PV modules are dark in colour due to their anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures to enable maximum

absorption. The combination of these factors significantly increases electrical energy production of the panels and at the same time significantly reduces reflected rays.

- 14.8.2 Any predicted effects towards the ground-based receptors can likely be solved with relatively simple mitigation strategies – the most common being the provision of screening at the Site perimeter to obstruct views of potentially reflecting panels. Where views of reflecting panels are obstructed, no significant effects will be experienced.
- 14.8.3 Other solutions for non-ground-based receptors such as layout modification can be considered but are rarely required in practice.
- 14.8.4 Effects during the construction and decommissioning phases will be less than, or comparable to, effects during the operational phase, due to there being fewer PV panels during these phases than the operational phases.
- 14.8.5 Based on the potential to address the potential for significant effects through embedded design mitigation, it is recommended that Glint and Glare is **scoped out** of the EIA Report (EIAR) and that a separate standalone assessment of Glint and Glare during the operational phase is provided in support of the S.36 application.
- 14.8.6 In the circumstance where it is not possible to secure mitigation to reduce the effects to not significant, then the Glint and Glare chapter would be scoped in to the EIAR.
- 14.8.7 A description of any embedded design mitigation or any relevant mitigation measures to address safety considerations with regard to glint and glare from the Proposed Development will be included in the relevant section of the EIAR and associated Design and Access Statement.

14.9 Questions to Consultees

- Do consultees agree with the receptors identified, or are there other receptors that should be taken into consideration?
- Should other consultees than those identified be consulted?
- Do consultees agree with the methodology for the assessment of Glint and Glare?
- Do consultees agree with the study areas proposed?
- Do consultees agree that where embedded design mitigation as set out in this chapter is capable of reducing effects to not significant, that Glint and Glare can be Scoped out of the EIAR and provided as a standalone assessment only?

14.10 References and Guidance

- Planning Inspectorate. (2020). Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an/nationally-significant-infrastructure-projects-advice-note->

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