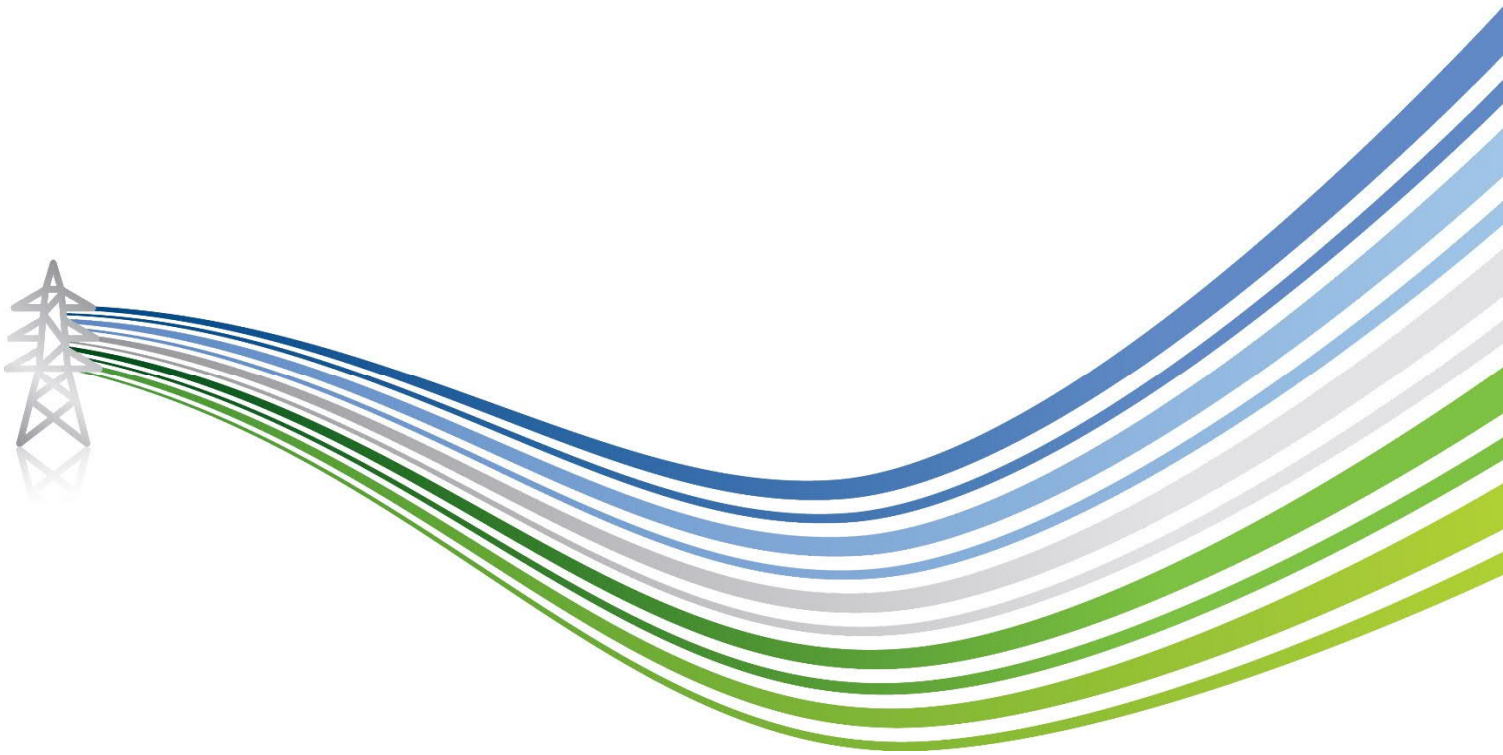
Scottish & Southern Electricity Networks

TRANSMISSION

Scottish Hydro Electric Transmission plc

Dunoon to Whistlefield (non s37) OHL Works Environmental Appraisal

September 2023



Scottish Hydro Electric Transmission plc
Inveralmond House
200 Dunkeld Road
Perth PH1 3AQ
Tel: +44 (0)1738 456 000
www.ssen-transmission.co.uk

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Appendix A Figure List

1. INTRODUCTION

1.1 Background

1.1.1 This Environmental Appraisal (EA) has been prepared by WSP UK Ltd. on behalf of Scottish Hydro Electric Transmission plc. who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands.

1.1.2 Dunoon is currently connected to the wider electricity transmission network by a double circuit 132 kV OHL, supported on steel lattice towers between SSEN Transmission's existing Dunoon Substation, located west of Sandbank on Holy Loch and Whistlefield Substation, belonging to SP Transmission plc (SPT) located north-west of Garelochhead; see **Figure 1.1 Site Location**.

1.1.3 The existing OHL crosses Loch Long with a 1.4 km span, supported by four special structures (those comprising two very tall steel lattice towers on either side of Loch Long with two very heavy tension towers behind those tall towers) forming the crossing. As the existing OHL crosses Loch Long it passes between Transmission Network Operator areas. The transmission line to the west of the Loch Long crossing connecting to Dunoon Substation is within the SSEN Transmission's licenced area, whilst the OHL on the east of the Loch Long crossing is within Scottish Power Transmission's licenced area.

1.1.4 The existing OHL west of the Loch Long crossing is supported by steel lattice towers which are coming towards the end of their operational life. The OHL route crosses some very steep and exposed terrain and has a very high fault rate associated with it during high winds due to the design of tower used in the original build. SSEN Transmission has established a requirement to replace the existing OHL to ensure security of supply.

1.1.5 Due to the need to maintain supply to Dunoon during the rebuild, it was proposed to build a replacement OHL offline from the existing OHL, mostly on a different alignment and requiring temporary OHL diversions where the proposed replacement OHL is to be built on or close to the existing alignment. The replacement OHL is subject to a new section 37 consent.

1.1.6 In February 2023 SSEN Transmission submitted an application for consent under section 37 (s37) of the Electricity Act 1989[1] to construct and operate a double circuit steel structure 132 kV overhead transmission line (OHL) between their existing Dunoon Substation and Tower 15 of the existing OHL, located to the west of the Loch Long crossing. SSEN Transmission also sought deemed planning permission under section 57 of the Town and Country Planning (Scotland) Act 1997[2] for certain elements of the project, or ancillary works required to facilitate its construction and operation. This project was referred to as 'Dunoon to Loch Long 132 kV OHL Rebuild Project'.

1.1.7 The following works are also required to complete the full refurbishment of the existing OHL, however they are being consented under different regimes, do not require section 37 consent, and therefore did not form part of the s37 Application; these are the focus of this EA and are hereafter referred to as the Proposed Development.

- upgrades required to the special crossing structures or their foundations (Towers 12 - 15), including access where necessary - deemed consent under SSEN Transmissions' Operational Licence;
- reconductoring of the existing Loch Long crossing, replacing the wires which carry the current and the associated fittings and fixtures, re-using the four existing special structures which support the Loch Long crossing span - deemed consent under Transmission Network Operator's Licence and

[1] UK Government (1989). 'The Electricity Act 1989'. Available at: https://www.legislation.gov.uk/ukpga/1989/29/contents
[2] Scottish Government (1997).'Town and Country Planning (Scotland) Act 1997'. Available at: https://www.legislation.gov.uk/ukpga/1997/8/contents

subject to separate consent under the Marine (Scotland) Act 2010[3] (this consent is being prepared separately to this EA); and

- removal of the existing OHL conductors and dismantling of redundant towers - Permitted Development under The Town and Country Planning (General Permitted Development) (Scotland) Order 1992[4]; Class 40(1)(f) "*any other development carried out in, on, over or under the operational land of the undertaking*".

1.1.8 SSEN Transmission has therefore voluntarily prepared this EA which evaluates whether any specific environmental effects are likely to occur resulting from these development proposals. The EA and any mitigation recommended to avoid or minimise any associated environmental risks will inform site-specific commitments register which will be appended to the Contractor's Construction Environmental Management Plan (CEMP).

1.2 Site Location

1.2.1 The site comprises the existing OHL from Dunoon Substation in the south, Tower 93 (National Grid Reference (NGR) 216142, 679807) to the Loch Long Crossing in the north (Tower 15 NGR 220887, 692061); the special structures of the crossing located both sides of the loch (Tower 15 and Tower 12 NGR 220887, 692061) and access to them; and reconductoring over the loch; see **Figure 1.2 Site Layout**.

1.2.2 The "Site" is defined as the area of land which encompasses the extent of the current Operational Corridor for the existing OHL, and the footprint of works for the upgrades to Towers 12 to 15 and accesses and helicopter compounds as illustrated in **Figure 1.2**, including both temporary and permanent infrastructure.

1.3 Site Context

1.3.1 The Site is located north of Dunoon within a hilly, coastal and rural area due to its extensive nature. The hills surrounding the Site are steep and covered in woodland. There are residential properties towards the southern end of the Site. The area comprises of large hill tops which have heights below 700 m. The existing OHL runs south-west to north-east through the Site, as shown in **Figure 1.2**.

1.3.2 The Site crosses Loch Long from east to west before travelling south, through hills such as Am Binnein and Stronchullin Hill and residential areas such as Rashfield and Invereck, before finishing in Sandbank.

1.4 Environmental Context

1.4.1 **Figure 1.3** illustrates the statutory and non-statutory designations and other environmental features within 5 km of the Site.

[3] Scottish Government (2010). The Marine (Scotland) Act 2010. Available at: https://www.legislation.gov.uk/asp/2010/5/contents
[4] Scottish Government (1992). The Town and Country Planning (General Permitted Development) (Scotland) Order 1992. Available at: https://www.legislation.gov.uk/uksi/1992/223/schedule/1/made

2. PROPOSED DEVELOPMENT

2.1 Components

2.1.1 The Proposed Development comprises the following elements which are described in more detail in the following sections, the locations are illustrated in **Figure 1.2 Site Layout**:

- intrusive foundation investigation and upgrade works for Towers 12 to 15 including access track upgrade and new access track formation to Tower 12;
- reconductoring phase conductors (replacement of the phase conductors), replacement of the earthwire, and replacement of insulators and fittings for Towers 12 to 15; and
- removal of the Existing OHL and towers from Tower 16 to Tower 93 including temporary access.

2.1.2 Associated works required to facilitate the Proposed Development would include vegetation clearance, temporary site compounds, working areas (including helicopter operation compounds), equipotential zones (EPZ), and temporary measures to protect the road, rail and water crossings.

2.1.3 There is some limited forestry removal to the west of the Loch Long crossing however this has been included within the assessment for the Dunoon to Loch Long 132 kV OHL Rebuild Project s37 application; and therefore is scoped out of this appraisal. Mitigation for forestry loss will be captured in the s37 commitments.

2.2 Construction Activities

Construction Compound

2.2.1 It is currently anticipated that there will be one main compound required to facilitate construction works (including office provision), the location of which will be confirmed by the Principal Contractor(s) and therefore will not be known nor considered in the EA (anticipated to be nearer Dunoon due to more central and suitable areas). Potential impacts from the compounds will be minimised and controlled via the Construction Environmental Management Plan (CEMP), which will be prepared and implemented by the Principal Contractor.

2.2.2 In addition, it is likely that a 'rolling' arrangement for the provision of small sub yards, offices and welfare facilities will be required at convenient positions along Site, with activity at these sites varying, in accordance with the phase of works at that location. The use of smaller multiple yard sites would minimise the quantity and lengths of journeys required to supply to and recover from each work area.

2.2.3 The obtaining of any necessary planning consent or other authorisations required for the site compounds will be the responsibility of the Principal Contractor.

Access Arrangements

2.2.4 In general, access to the tower locations will either be via:

- existing access tracks;
- accesses detailed within the Dunoon to Loch Long 132 kV OHL Rebuild Project s37 application; or
- All-Terrain Vehicle (ATV) routes with an indicative width of 5 m. Protection measures will be used to protect sensitive habitats where possible, including plastic/metal access panels, bog mats or other temporary measures.

2.2.5 **Figure 1.2 Site Layout** illustrates the ATV routes in addition to the accesses which were included in the Dunoon to Loch Long 132 kV OHL Rebuild Project s37 application, which have been included for context.

2.2.6 The access for Tower 12 will include a section of existing track upgrade and new permanent track (permanent width approximately 6 m including drainage, which may be reduced in width or partially resonated on completion of construction works, as agreed with the landowner (MOD)). Where the existing track meets the public highway an existing road junction will be utilised which requires minimal upgrade (if any).

2.2.7 It is anticipated that ATV access will be very difficult between Towers 21 – 30. The preferred access method will be using ATVs, but where this is not possible, operatives will be flown to suitably nearby locations and will access on foot. Felled towers will be broken down into bundles and steelwork will be flown out using a helicopter.

2.2.8 Access to helicopter compounds is not confirmed at this stage, therefore for this environmental appraisal, it has been assumed that access is likely to follow edges of existing fields, and using existing agricultural access tracks were possible, with appropriate upgrades and temporary accesses as required.

2.2.9 For any new permanent or ATV access a Limit of Deviation of 100 m either side of the access is proposed to allow for changes required associated with detail design or avoidance of sensitive constraints.

2.2.10 No watercourse crossings are proposed based on 1:50,000 scale Ordnance Survey mapping.

Steel Works and Foundation Works

2.2.11 Upgrades to steelwork and/ or foundations may be required for Towers 12 to 15. At each tower there would be a temporary working area of approximately 40 m by 40 m, which would be demarcated with warning cones, barriers or temporary fencing.

Steel Works

2.2.12 Steel reinforcement works would comprise the replacement of damaged steelwork and the addition of new steel bars, where required, to strengthen tower arms. New steelwork, plant and materials would be delivered to each tower location by a 4x4 Hiab wagon or similar. The steel bars would be lifted and lowered in a controlled manner using a rope or winch, and new bars secured into place.

Foundation Works

2.2.13 Foundation reinforcement works may be required where engineering studies indicate that the existing foundations are not strong enough to support the new conductors. The foundation works would comprise the following steps:

- materials and plant would be delivered to the tower locations by 4x4 Hiab wagon, or similar;
- the area around the tower legs would be excavated using a tracked excavator. Topsoil and subsoil would be stockpiled in separate areas for final replacement when backfilling;
- any excess water from the excavation would be pumped out and discharged to suitable ground, with sediment control measures implemented if required in consultation with the project ECoW;
- the excavation would be prepared for concrete pouring, and the existing concrete column removed using the excavator with a mounted hydraulic breaker and/or hand breaker;
- following completion of all foundation preparation works, ready-mixed concrete would be poured into the excavation until the pad and column is complete; and
- following completion of concrete works and after allowing sufficient curing time, all formwork and excavation shoring equipment would be removed from the excavation, and the excavation backfilled with suitable soil free of any large stones or boulders and covered with topsoil to the original ground surface level.

Re-conductoring Works

2.2.14 The towers at either end (T12 and T15) would be set up for positioning of winching and tensioner equipment, conductor drums and reels. This machinery would be set up on an equipotential zone (EPZ) which provides a flat safe working area and protects the workers from potential electric shock. The EPZ would typically consist of metal trackway panels covering an area of approximately 20 m x 40 m. Tower 15 requires two EPZ areas to be set up. **Photograph 2.1** illustrates a typical EPZ with equipment set up for re-conductoring.

2.2.15 All four towers within the pulled section would be accessed to prepare the tower site and to prepare the conductors for pulling. This would involve setting up demarcation around the tower base and working areas using warning cones, ropes or temporary barriers. The tower peaks and arms would be accessed to remove existing fittings and dampers and to transfer the conductors into a running out block attached to the tower steelwork.

Photograph 2.1 Typical EPZ with equipment set up for re-conductoring

2.2.16 The towers at either end of the pull would be set up with a winch at one end and a tensioner machine at the other. These machines would be positioned on the EPZ and anchored. The conductor drum with the new conductor would be set up at the tensioner end tower, while empty drum reels would be set up at the winch end to spool the conductor being replaced. The towers at both ends would be accessed and rigged to the equipment on the ground.

2.2.17 Once works are set up, the pulling out of the new conductors would be undertaken. This is done by pulling in the old conductor which in turn is connected to the new conductor. As the old conductor is pulled through and reeled up from one end of the section, the new conductor is pulled through behind it. The winch and tensioner machines would be used throughout this operation to control the sag until the new conductor is connected into the conductor fittings at either end of the section.

2.2.18 Due to the length of the span being reconductored across Loch Long, and the significant challenges that would be realised should control of the conductor be lost and the span dropped, a Catenary Support System (CSS) is proposed to be used (installation of scaffold as may be used to protect other sensitive span crossings is not appropriate due to the length and nature of this span).

2.2.19 The CSS consists of a number of catchblocks deployed along the span on the phase/ earthwire conductor being replaced, deployed using a powered tug. The catchblocks are connected using a special braided rope (Dyneema rope) on either side of the conductor and span full span at a pre-

determined spacing. This CSS acts as a safeguard and prevents the conductor from dropping into the water in the event of a failure when replacing the conductor.

2.2.20 The replacement conductor would be pulled through the blocks and CSS using the existing conductor in a continuous stringing method, under reduced tension. The existing conductor is pulled one phase at a time in sequence top, middle, bottom. Current conductor tension is reduced during this operation, but sufficient tension will remain to ensure conductor never comes into contact with the water, and a 20 m clearance above the waterline is to be aimed for throughout the operation.

2.2.21 The replacement of the existing earthwire will following a similar process.

Replacement of Insulators and Fittings

2.2.22 Insulators and fittings would be replaced at the same time as the re-conductoring/ earthwire replacement works are undertaken.

2.2.23 The exact method of working would be determined by the Principal Contractor. Typically, once the conductor has been transferred to a running out block attached to the tower steelwork, the old insulator string would be disconnected from the tower crossarm and lowered to the ground. The new insulator string would be lifted up, and attached, to the crossarm. Pull lifts would likely be used to lift and support the conductors whilst the insulators are replaced.

2.2.24 For suspension towers, the operatives would typically access the conductor beneath the tower crossarms by using lightweight aluminium working platforms or hook ladders. The ladders may be hoisted up the tower manually or by using a small winch.

2.2.25 For the tension towers, a tower working platform would be required to enable the operatives to access the conductors and insulators. This would be lifted into place utilising the winches and securely attached and stabilised to the cross arm and tower.

2.2.26 **Photograph 2.2** shows a team of operatives replacing insulators sets on an existing OHL suspension tower.

Photograph 2.2 Replacing insulators on an existing OHL tower

2.2.27 On completion of re-conductoring, insulator replacement and the sagging of conductor final tension, the conductors would be clamped into new suspension clamps at each suspension tower.

Scaffolds and Crossings

2.2.28 For removal of the existing OHL, where there are major road, rail or built-up area crossings under the section of OHL it is likely that a form of mechanical protection, such as scaffolding or other approved method, would need to be supplied and erected to provide protection to members of the public and property in case of equipment failure. Such areas would be identified by the successful Principal Contractor(s) and appropriate protection methods agreed with the relevant Local Authority. On minor roads the conductor may be lowered under a temporary closure of the road to protect users. **Photograph 3.3** shows an example of a temporary construction scaffold at a road crossing.

Photograph 2.3 Illustrative Image of Temporary Construction Scaffolds

Commissioning

2.2.29 After reconductoring of the Loch Long crossing and prior to energisation of the new line (outwith scope of this EA) the new and refurbished OHL will be subject to an inspection and snagging process. This allows the Principal Contractor and SSEN Transmission to check that the works have been built to specification and are fit to energise. The Proposed Development will also go through a commissioning procedure for the switchgear, communications and protection controls through the substations at Dunoon and Whistlefield before the circuits will be energised and the OHL becomes operational.

Dismantling Existing OHL

2.2.30 Following commissioning of the Loch Long crossing, the existing OHL will be dismantled. Conductors and insulators would be removed. The conductors would be collected using winch and cable drum, using a method similar to that described above. Tower removal is typically completed by cutting the legs and felling the tower in a controlled manner. The towers are then cut into sections using hydraulic shears and the tower leg stubs and concrete foundation are normally decommissioned in situ, with stubs folded into an excavation of approximately 1 m depth within the tower's footprint, and the ground reinstated.

2.2.31 The sections of tower will either be extracted from the site using an ATV or flown out by helicopter depending on the location of the tower; **Figure 1.2 Site Layout** indicates the towers where helicopter

extraction will be used. Where a helicopter is used, the steelwork will be flown to one of four helicopter operation compounds where the steelwork will be cut-up before being taken off-site by vehicle.

Reinstatement

2.2.32 Following completion of the works, all construction sites will be reinstated. Reinstatement will form part of the contract obligations for the Principal Contractor and will include the removal of all work sites around the tower locations and the re-vegetation of all construction compounds etc.

2.2.33 Each site will be allowed to re-vegetate naturally wherever possible.

Material Use

2.2.34 Wherever possible, SSEN Transmission will seek opportunities to minimise import and export of materials. Potential measures include reusing any waste arising from the construction into design; for example, topsoil will be utilised in restoring the Site.

2.2.35 All scrap metal, conductors and glass insulators from the dismantled towers would be removed from site for recycling.

Employment

2.2.36 SSEN Transmission will appoint a Principal Contractor to deliver the works, who may use subcontractors to undertake specific task. There are opportunities for direct local employment to the appointed Principal Contractor, as well as local contractors to be engaged.

Construction Traffic

2.2.37 The construction activities will give rise to regular numbers of transport movements, with small work crews travelling to Site. It is anticipated that the Principal Contractor will identify a single safe area within the contractors' compound for parking away from the public road.

2.2.38 Vehicle movements will be required in relation to the construction of new or upgraded access roads, for the delivery of the foundation and tower components and conductor materials to site, for the delivery and collection of materials and construction plant from the main site compound to individual tower locations and for the removal of materials from dismantled towers.

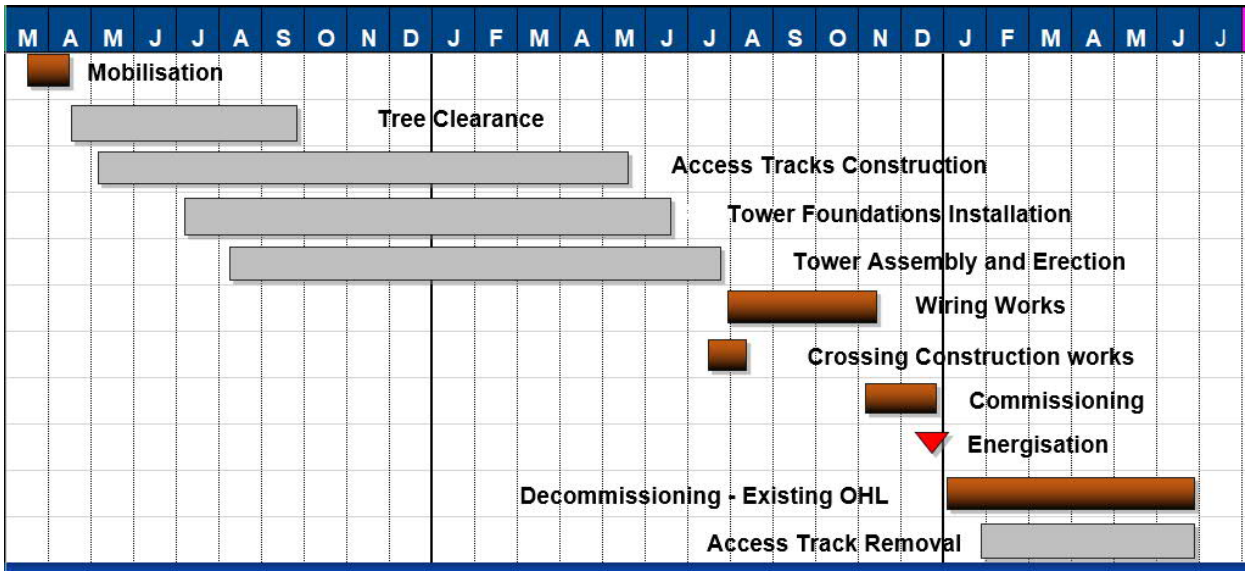
2.2.39 A Construction Traffic Management Plan (CTMP) will be developed by the Principal Contractor, which will be agreed with Argyll and Bute Council's roads team in advance of construction works commencing. A Framework CTMP is provided in **Appendix B** which covers these works and the wider Dunoon to Loch Long 132 kV OHL Rebuild Project works.

2.3 Construction Programme and Working Hours

2.3.1 It is anticipated that construction for the project as a whole, including the s37 works, will commence in 2024 (subject to consents and approvals being granted). A provisional construction period of 30 months in total is anticipated, with energisation of the project scheduled for 2026.

2.3.2 The detailed construction phasing and programme would be subject to change as the design progresses and also due to necessary consents and wayleaves being agreed. **Table 2-1** presents the high-level construction phasing. The items in grey are associated with the wider Dunoon to Loch Long 132 kV OHL Rebuild Project; those in brown relate to the Proposed Development specifically.

Table 2-1: Construction Programme (monthly)



2.3.3 Employment of construction staff will be the responsibility of the Principal Contractor but SSEN Transmission encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

2.3.4 It is envisaged that there will be a number of separate teams working at the same time at different locations within the Proposed Development corridor. The resource levels will be dependent on the final construction sequence and will be determined by the Principal Contractor.

2.3.5 Construction activities will, in general, be undertaken during daytime periods only. For weekdays, this will involve work between approximately 07:00 to 19:00 in the summer and 07:30 to 17:30 (or as daylight allows) in the winter. Seven day working will be required due to the phased nature of the works, limitations of outage availability and working patterns of some contractors. Any variation in these working hours will be agreed in advance with the local planning authority.

2.4 Construction Environmental Management

Construction Environmental Management Plan (CEMP)

2.4.1 A CEMP will be prepared and implemented by the Principal Contractor. This document will detail how the Principal Contractor will manage the site in accordance with all commitments and mitigation detailed in this EA Report, statutory consents and authorisations, and industry best practise and guidance. **Table 2-2** sets out key construction good practice measures and **Chapter 9: Schedule of Mitigation** provides a schedule of the committed mitigation measures included in this report.

2.4.2 The CEMP will also reference the SSEN Transmission's set of General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) that are applied as a standard requirement to all construction sites and practices. The GEMPs and SPPs considered relevant to this project are provided in **Appendix C** and also listed in **Table 2-2.**

2.4.3 The implementation of the CEMP will be managed on-site by a suitably qualified and experienced Environmental Clerk of Works (ECoW), with support from other environmental professionals as required. SSEN Transmission will also audit and inspect environmental performance to ensure compliance to legislation, conditions and best practices, in line with their ISO 14001 accredited Environmental Management System.

Construction Good Practice

2.4.4 Construction Good Practice includes tried and tested mitigation measures which it is reasonable to assume are being implemented. It specifically includes:

- SSEN Transmission's GEMPs and SPPs; and
- Other standard construction practices or legislative requirements including recommended published guidance from statutory bodies.

2.4.5 **Table 2-2** lists key construction good practice measures assumed to be implemented for the purpose of the environmental appraisal.

Table 2-2: Key Construction Good Practice Measures.

Ref	Title	Description
GE1	General Environmental Management Plans	• Oil storage and refuelling; • Soil management; • Working in or near water; • Working in sensitive habitats; • Working with concrete; • Waste management; • Private water supplies; • Forestry; • Dust management; • Biosecurity on land; • Restoration; and • Bad weather.
GE2	Species Protection Plans	• Badger; • Bat; • Bird; • Otter; • Red squirrel; and • Pine marten.
GE3	Noise Management Plan	The Contractor will be required to produce and implement a Noise Management Plan for their construction activities. The plan will be agreed with Argyll and Bute Council. This will ensure compliance with the relevant EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and guidance set out in BS 5228-1:2009+A1:2014 which covers noise control on construction sites.
GE4	Site Water Management Plan	A Site Water Management Plan will be developed to manage potential risks to the water environment including locations for silt mitigation measures, dewatering of excavations inclusive of pump locations, monitoring points, cut off drains, and Sustainable Drainage Systems (SuDS) (incl. compound). In addition, this plan will show how rivers downstream will be protected from sedimentation or pollution resulting from the project activities. The Site Water Management Plan will include details of the layout of the Proposed Development, as well as any access tracks detailing all locations of water mitigation measures. All relevant activities will be undertaken in compliance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011[5] (as amended).

[5] Scottish Government (2011). The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Available at: https://www.legislation.gov.uk/ssi/2011/209/contents/made

Ref	Title	Description
		GEMPs for 'Oil Storage and Refuelling', 'Soil Removal, Storage and Reinstatement', and 'Working with Concrete' will be adhered to.
GE5	Construction Traffic Management Plan	A Construction Traffic Management Plan will be developed by the Contractor, which will be agreed with Argyll and Bute Council roads team as part of pre-commencement conditions in advance of construction; a Framework CTMP is provided in **Appendix B**; which covers these works and the wider Dunoon to Loch Long 132 kV OHL Rebuild Project works.
GE6	Emergency	An Environmental Emergency Response Plan will be developed by the contractor to deal with, among other things, accidental spills / leaks. Appropriate oil spill kits will be located on site and in key vehicles. Site staff will be trained in their use and provided with advice on action(s) to be taken and who should be informed in the event of a pollution incident. Emergency response teams and contractors, their locations and response times will be identified in the plan.
GE7	Welfare facilities	On-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of an on-site septic tank with soak away, tankering and off-site disposal depending on agreement with SEPA; or discharge to foul sewer.
GE8	Car Sharing	Adoption of car sharing where possible to reduce the number of vehicles arriving and departing from the site.
GE9	Local residents	Local residents will be kept informed of any potentially disruptive activities and actions being taken to mitigate the impact of these activities.
GE10	Validity of Baseline Conditions	Where construction has not commenced within 12 months and conditions for species may have changed, protected species surveys will be repeated in order to provide the most accurate and up to date recommendations for the Site.

Enhancements - Biodiversity Net Gain

2.4.6 SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from construction and operational activities. In line with this approach, SSEN Transmission is undertaking a Biodiversity Net Gain Assessment for the Proposed Development. This will entail quantification of the pre- and post-development biodiversity across the Site to determine the actions necessary to work towards a net gain biodiversity target.

2.5 Operation and Maintenance

2.5.1 SSEN Transmission will have ownership of, and responsibility for, maintenance activities for all elements of the Proposed Development. Appropriate maintenance works will be carried out routinely and as soon as practicable following any unexpected events on-site.

3. APPRAISAL SCOPE AND METHODOLOGY

3.1 Approach to the EA

3.1.1 The approach followed in the EA is to initially identify the topics which require a level of assessment to determine the potential for likely direct and indirect environmental effects. This is achieved through a scoping exercise taking into consideration potential sensitive receptors and the nature of the construction and operation of the Proposed Development. 'Scoped out' topics are not considered further in the appraisal.

3.1.2 For the 'scoped-in' topics, this EA provides a concise appraisal of the likely direct and indirect environmental risks that the Proposed Development may pose; and makes recommendations for additional mitigations measures as required. The EA has been undertaken based on appropriate methodologies and best practice guidelines. Further details on this are provided in specific topic sections where considered relevant.

3.1.3 The final section of the report collates the additional mitigation measures recommended in each of the appraisal chapters which will be taken forward for inclusion in the site-specific CEMP.

3.2 Scope of Appraisal

3.2.1 An initial review of baseline conditions and sensitive receptors has been undertaken. **Figure 1.3** illustrates the identified environmental considerations located within 1 km of the Site and up to 2 km for international designations.

3.2.2 For each topic, the potential for environmental effects on these receptors has been considered and is documented in **Table 3-1**, which also indicates whether the topic is 'scoped in' or 'scoped out' of further assessment as discussed above. This relates purely to the construction phase as the project relates to removal and refurbishment of existing infrastructure only.

Table 3-1: Scoping Review

Topic	Description	Scoped in / out of appraisal
Landscape Character & Visual Amenity	Construction effects on landscape character are temporary, and predominantly localised at each tower individual tower, and are therefore unlikely to result in substantial effects on landscape character, with the exception of construction effects on Glen Finart where construction activities are concentrated within a sensitive landscape. Therefore, landscape effects have been scoped out of this EA with the exception of potential effects on the landscape character of Glen Finart. Similarly, due to the localised nature of the majority of the construction effects, focussed at each individual tower which are frequently visually contained by landform and/or vegetation, the appraisal of visual effects focusses on Glen Finart, Stronchullin, Strath Eachaig and the new access track to the east of Loch Long where visual effects and visual receptors are concentrated within a relatively open and accessible landscape. Permanent operation effects on sensitive visual receptors have been scoped out.	In
Cultural Heritage	Potential for construction impacts from the Proposed Development on cultural heritage	In

Topic	Description	Scoped in / out of appraisal
Ecology and Nature Conservation	Potential for construction impacts from the Proposed Development on biodiversity.	In
Hydrology, Hydrogeology and Soils	Potential for construction impacts from the Proposed Development on the water environment and peat.	In
Noise and Vibration	Temporary construction noise impacts have been scoped in to this appraisal. Construction traffic noise; noise from the construction compound; construction vibration and all operational effects have been scoped out; further justification is provided in the Noise and Vibration chapter.	In
Key Recreation Uses	Due to the nature of the Proposed Development, disruption of recreation and tourist activities is likely for the construction phase of the T12-15 upgrades and during the dismantling of redundant towers, causing temporary disruption to core paths, National Cycle Route 75, and other walkways/access routes to gain access required for the works. There may also be indirect impacts upon the amenity of nearby tourism and recreation facilities due to noise, dust, and visual impacts. An Access Management Plan will be produced as part of the CEMP to minimise these effects. However, these would be localised and temporary. **Therefore, potential impacts upon recreation are not considered further in this appraisal.**	Out
Land Use	The Land Capability for Agriculture at the Site does not include any prime agricultural land. Due to the nature of the Proposed Development as largely involving removal of existing towers, potential impacts on land use would primarily occur during the enabling work phase of construction, including the establishment of temporary accesses, construction compounds, and helicopter operation compounds. **Potential impacts upon land use are not considered to be significant and are therefore not discussed further in this appraisal.**	Out
Traffic and Transport	Any traffic and transport impacts on the local road network as a result of the Proposed Development will occur during the construction period only and will be temporary in nature. Traffic management measures, by way of a detailed Construction Traffic Management Plan (CTMP) will be produced by the main contractor, to reduce the potential effects of the construction traffic on the surrounding road network and will be included within the CEMP. A Framework CTMP is Provided in **Appendix B**. **Potential impacts upon traffic and transport are not considered to be significant and are therefore not discussed further in this appraisal.**	Out
Air Quality and Climate	Dust and vehicle emissions during construction will be managed through the application of standard good practice mitigation, which will be stated in the CEMP and GEMP for Dust. Although there will be greenhouse gas emissions associated with construction activities and embedded in the construction components, operational emissions are anticipated to be minimal.	Out

Topic	Description	Scoped in / out of appraisal
	Potential effects upon air quality and climate are not considered to be significant and therefore are not discussed further in this appraisal.	
Major Accidents and Disasters	The potential for the risk of a major accident and disaster affecting the vulnerability of the existing OHL is likely to be limited to those associated with unplanned power outages, due to extreme weather or structural damage. Crisis management and continuity plans are in place across the SSE Group. These are tested regularly and are designed for the management of, and recovery from, significant energy infrastructure failure events. **Potential impacts of Major Accidents and Disasters are not considered to be significant and are therefore not discussed further in this appraisal.**	Out
Population and Human Health	The Proposed Development is located within a predominantly rural landscape. Particular settlements in close proximity to the Proposed Development are Rashfield and Sandbank. The impacts on population and human health for a development of this nature and scale are limited. There is potentially a benefit to the local economy during the construction phase. The most likely impacts upon human health would arise from noise and vibration, which is discussed and assessed within the Noise and Vibration chapter of this appraisal. **Potential effects upon population and human health are not considered to be significant and therefore are not discussed further in this appraisal.**	Out
Material Assets and Waste	The Proposed Development would require material consumption for replacement conductors, insulators, other fittings, upgrades to steel work and foundation works. General construction waste from the construction compound would be generated. The nature and scale of the Proposed Development means waste generation will be fairly high, however it is anticipated that all scrap metal, conductors, glass insulators and dismantled towers will be removed from the site for recycling. The use of recycled materials where it is feasible to do so and minimisation of waste will be advocated and this will be included in the CEMP which would be produced and implemented by the Principal Contractor(s). **Potential impacts upon material assets and waste are therefore not discussed further in this appraisal.**	Out

3.3 Mitigation Measures

3.3.1 Mitigation measures are those measures which are identified to prevent, reduce or remedy any potential adverse effects of a proposal. There are different types of mitigation identified and implemented in this report:

- 'Embedded mitigation' comprises both design features and construction good practice, set out in Table 2.2. These measures are implemented during detailed design, construction and or operation of the Proposed Development.

- 'Additional mitigation': Where necessary, the appraisal in Chapters 4-8 has stated additional mitigation measures which will be taken forward by SSEN Transmission in order to minimise potential effects. These measures are included in the individual technical chapters and **Chapter 9: Summary of Mitigation Measures**.

3.3.2 The CTMP will include the Embedded Mitigation measures discussed above in addition to the Additional Mitigation measures identified through this appraisal and listed in **Chapter 9: Summary of Mitigation Measures**.

3.4 Cumulative Effects

3.4.1 A search for developments was undertaken on 31st March 2023, which considered developments recorded as requiring an EIA within 5 km of the OHL which have been submitted or approved within the last 5 years; it is considered that developments beyond this distance are unlikely to have cumulative impacts with the Proposed Development. Only one development requiring an EIA was recorded within 5 km, which is an element of the wider project:

- the proposed Dunoon to Loch Long 132 kV rebuild (23/00410/S37). The section 37 application for this development is currently subject to determination by the Scottish Ministers.

3.4.2 Cumulative assessment of all aspects of the Proposed Development discussed within this Environmental Appraisal in combination with the Dunoon to Loch Long 132 kV OHL Rebuild Project was presented in the EIA Report for the s37 application. The conclusions are shown in **Table 3-2;** note that the 'Proposed Development' in the table below relates to the s37 application and the 'decommissioning of the existing OHL' relates to this project.

Table 3.2: Summary of Cumulative assessment from s37 application

Topic	Description
Landscape & Visual	A temporary Major-Moderate adverse cumulative landscape effect is likely to occur on Glen Finart Landscape Unit (LU) as a result of the simultaneous construction of the Proposed Development and the cumulative schemes due to the concentration of large-scale construction activities within a tranquil glen. A temporary Moderate adverse cumulative landscape effect is likely to occur on Creachan Mòr LU should all the cumulative schemes be constructed simultaneously due to the increased vehicular movement, noise and helicopter flights within a similar area. A temporary Major adverse and a Major-Moderate to Moderate-Minor adverse cumulative visual effect on residents to the south-east of Barnacabber Farm and users of proposed Holiday Dwellings at Barnacabber Farm, respectively, are likely to arise during the construction phase should the cumulative schemes be constructed simultaneously. Users of the road through Glen Finart are likely to experience a temporary Moderate adverse to Moderate-Minor adverse cumulative effect during the construction phase. However, whilst more intense, the simultaneous construction would result in construction activity having a shorter duration. It should be noted that the above represents a worst case whereby the decommissioning of the existing line takes place concurrently with construction of the Proposed Development. The decommissioning of the existing OHL would take place towards the end of the construction programme for the Proposed Development, and concurrently with access track removal, therefore, although lengthening the construction period, is not likely to increase the magnitude of activity substantially.
Ecology and Nature Conservation	The terrestrial habitats within the vicinity of Towers 12 and 15 and their access tracks are expected to largely coincide with the Proposed Development's Survey Area and

Topic	Description
	have the potential to support or contain the terrestrial Important Ecological Features (IEFs) assessed within the Ecological Impact Assessment (EcIA). As a result of this project, the current tree maintenance/ clearance activities within the existing OHL Operational Corridor would cease. A lesser amount of habitat loss, degradation or fragmentation is anticipated from this project. The redundant Operational Corridor has the potential to promote the establishment of more diverse native habitats, either through natural regeneration or direct action from the landowners. This also has the potential to improve habitat connectivity in these regions. As the existing OHL alignment is located in close proximity to the proposed OHL alignment, the indirect impacts and effects of this project are anticipated to be similar to, or less than, those associated with the Proposed Development. The terrestrial habitats along the proposed OHL alignment largely coincide with the Proposed Development's Survey Area and have the potential to support or contain the terrestrial IEF's assessed within this EcIA.
Ornithology	The plantation coniferous woodland adjacent on the west side of Loch Long and the open water of Loch Long are unlikely to be utilised by golden eagle, hen harrier or black grouse. Habitat in the vicinity of the tower on the eastern side of loch long, including access tracks, may be utilised by all three species. Mitigation detailed in the Bird SpPP will significantly reduce the likelihood of direct impacts on nesting birds and, being a related project to the Proposed Development, it is understood that all mitigation detailed in relation to black grouse will also apply to the Long Loch Crossing project, if relevant. Works on the eastern side of Loch Long would be undertaken across a maximum of two breeding seasons (one for access and one for works). In addition, the project is predicted to use the same proposed accesses and working areas, where applicable. Due to these factors, it is considered cumulative effects on golden eagle, hen harrier and black grouse will result in effects of Site level importance and are therefore not significant. It is anticipated that the project will encompass a maximum of one breeding season. Effects of the project will be very similar to the Proposed Development as the existing OHL is located in close proximity to the proposed OHL alignment. It is understood that all relevant mitigation in relation to the Proposed Development will apply to the project, particularly in relation to black grouse. In addition, the project is predicted to use the same proposed access tracks and working areas, where applicable. While the additional works activity, extending to three consecutive breeding seasons (including the Proposed Development) with increase the magnitude of potential effects it is anticipated that mitigation described for the Proposed Development will be equally effective on this project. While decommissioning of the existing OHL will follow immediately on completion of the Proposed Development there will be period (maximum 12 months) when sections of both OHL will be present in the landscape at the same time. Works associated with the decommissioning of the existing OHL will, to an extent, displace golden eagle, hen harrier and black grouse from the area and reduce the frequency of at risk flights. While collision risk could be expected to increase over this short period risk is considered to be negligible for all species with a marginal increase over one year not considered to result in any significant effects on the conservation status of local or regional populations.
Cultural Heritage	There are no cumulative effects anticipated from the Loch Long reconductoring works as these towers are between 4-5 km north of the closest heritage assets within the baseline. The decommissioning of the existing OHL is predicted to result in one Negligible Beneficial impact anticipated on Ardnadam Farmstead (*WoSAS Pin 45482*) (***HA9***) due to the removal of the existing towers from the vicinity of the heritage asset. No other cumulative effects are anticipated from the decommissioning works.

Topic	Description
Hydrology, Hydrogeology, Geology and Soils	Even in the event that these other developments present potentially significant effects to the receiving hydrology, hydrogeology, geology and soils environment in their own right, given that no significant residual effects have been identified associated with the Proposed Development, and assuming the effective 'source' controls for each individual development and good practice methodology, significant cumulative effects are not anticipated. Furthermore, the differing construction programming and activities that would be anticipated to occur across various developments reduces the probability that water quality and flow issues would be coincident across the catchments.
Noise and Vibration	It is anticipated that the decommissioning of the existing OHL will be undertaken in accordance with Best Practicable Means (BPM) (as per BS 5228-1 and BS 5228-2). The moderate significance of effect is considered as not significant due to the application of BPM at construction activity locations near to Tower 23. As such, there is no significant in-cumulative effects anticipated.
Forestry	Overall, the cumulative effect of woodland removal is assessed as a medium magnitude of change. Given the low sensitivity of commercial woodland within the Study Area, this cumulative effect is assessed as Minor Adverse and Not Significant. There are no additional indirect cumulative effects associated with native woodland.
Traffic and Transport	It is expected that the decommissioning of the existing OHL will occur at the same time as the access track removal for the Proposed Development. The current project construction programme presented in **Chapter 3 Description of the Proposed Development** shows the decommissioning works occurring in Q1 and Q2 in 2026, which is outwith the most onerous time period in the overall construction programme, which occurs during the months of June to August in 2024 and 2025. As such, it is considered that the assessment represents a worst case assessment and there would be no cumulative effects anticipated from the above works.

3.4.3 Planning applications for smaller scale developments have been identified within 5 km of the Proposed Development. Where these will result in the addition of new future receptors, these receptors have been considered within the assessment where appropriate, specific examples include:

- fifteen holiday dwellings at Barnacabber Farm, Ardentinny (application reference 2013/0328/DET);
- five residences south-west of Holy Loch Farm Cottage, Sandbank (application reference 19/00708/PP);
- forty holiday caravan pitches, Hunters Quay, Dunoon (application reference 18/02596/PP);
- four residences Hillcrest Robertson Terrace, Sandbank (application reference 19/01594/PP);
- three dwellinghouses with associated ancillary outbuildings, site of former Carrick Castle Hotel, Carrick Castle (application reference 2023/0035/DET);
- campsite with 12 campervan pitches and 15 tent pitches, Carrick Farm, Carrick Castle (application reference 2023/0003/DET); and
- crofthouse without occupancy restriction, Carrick Castle (application reference 2020/0333/DET).

4. LANDSCAPE AND VISUAL

4.1 Introduction

4.1.1 This section presents the findings of the Landscape and Visual Appraisal (LVA) for the Proposed Development. The purpose of the appraisal is to identify the key landscape and visual related aspects of the Proposed Development and describe the nature of the anticipated change to the landscape and visual environments.

4.1.2 The operational effect of the Proposed Development comprises the removal of the existing OHL, which is contingent on the proposed replacement OHL and as such the landscape and visual effects of the replacement OHL in the context of the removal of the existing OHL has been assessed in Chapter 6: Landscape and Visual Impact of the Environmental Impact Assessment Report for Dunoon to Loch Long 132 kV OHL Rebuild Project.

4.1.3 This section presents the construction phase effects of the Proposed Development which include:

- upgrades to Towers 12 – 15 including a new access track to the east of Loch Long;
- reconductoring of the existing Loch Long crossing; and
- removal of the existing OHL conductors and dismantling of the redundant towers.

4.1.4 Construction effects on landscape character are temporary, and predominantly localised at each tower individual tower, and are therefore unlikely to result in substantial effects on landscape character, with the exception of construction effects on Glen Finart where construction activities are concentrated within a sensitive landscape. Therefore, landscape effects have been scoped out of this EA with the exception of potential effects on the landscape character of Glen Finart.

4.1.5 Similarly, due to the localised nature of the majority of the construction effects, focussed at each individual tower which are frequently visually contained by landform and/or vegetation, the appraisal of visual effects focusses on Glen Finart, Stronchullin and Strath Eachaig where visual effects and visual receptors are concentrated within a relatively open and accessible landscape.

4.1.6 Additional information which supports this section is presented in the following appendix:

- **Appendix D** – Landscape and Visual Methodology

4.2 Information Sources

4.2.1 The following sources of information have been used to inform this report:

- Desk study – a desk-based review of existing information and online resources in order to inform the field surveys and subsequent appraisal; and
- Field Survey – undertaken in November 2019 and in March and May 2022 to verify the desk study findings, confirm the extent of visual influence and undertake the appraisal.

4.3 Methodology

Introduction

4.3.1 This LVA has been carried out broadly in accordance with best practice guidance in relation to Landscape and Visual Impact Assessment (LVIA) specifically with reference to the Landscape Institute and Institute of Environmental Management and Assessment (IEMA) Guidelines for Landscape and Visual Impact Assessment (GLVIA3). A full methodology is set out in **Appendix D** with a summary of the key aspects provided below. It is important to note, however, that as the Proposed Development is a non-EIA development, the scope of this LVA is proportionate to the nature and scale of the Proposed Development.

4.3.2 For landscape and visual appraisals, the significance of effect derives from the combination of the magnitude of change and the sensitivity of the landscape or visual receptor. Significance in this appraisal is used in its ordinary English meaning of 'of importance' or 'worthy of attention' to highlight any changes to landscape character or visual amenity of particular note.

Nature of Landscape and Visual Effects

4.3.3 The appraisal considers distinct but closely related areas: landscape character and visual amenity. These are described below.

Landscape

4.3.4 The character of the landscape derives from a combination of physical factors, natural processes and human intervention.

4.3.5 Landscape effects are a combination of the physical changes to the fabric of the landscape arising from the Proposed Development and perceptual changes – the way these physical changes alter how the landscape is perceived. The landscape appraisal considers the effect of the Proposed Development on the landscape as a whole; effects on significant individual elements of the landscape; and effects on characteristic combinations or patterns of elements and how these are seen to affect its character and quality.

4.3.6 Landscape character is generally considered to be a resource in its own right, which exists whether or not there are people present to experience it.

Visual

4.3.7 Visual appraisal is concerned with the views that are available to people who may be affected by the Proposed Development and their perception and responses to changes in these views.

4.3.8 Visual effects arise from changes in the composition and character of views available in the area affected. The appraisal considered the likely change that would be experienced, including the effects both on specific views and on general visual amenity.

4.3.9 For the purposes of appraisal, whilst it is the people living, working, passing through or enjoying recreational activities in the area who actually see the views and enjoy the visual amenity, it is the places they may occupy that are mapped and described as the 'receptors' of the views.

4.3.10 Effects are defined as beneficial, neutral or adverse. The decision regarding whether an effect is beneficial or adverse and the decision regarding the significance of effect are entirely separate. It is based on professional judgement and is acknowledged as a 'particularly challenging' aspect of assessment by GLVIA3 in its paragraph 2.15.

4.3.11 Neutral effects are those which overall are neither positive nor negative but may incorporate a combination of both. Beneficial effect would be for example providing enhancement or improvement to the landscape. Adverse effects result in the loss of characteristic elements or degradation of the landscape for example.

Extent of the Study Area

4.3.12 The area of study for the visual appraisal is no greater than the area from which the Proposed Development may be seen (by definition, visual effects can only occur where at least some part of the development is visible). Although the type and height of the towers of the Proposed Development can be perceptible up to 10 km based on Perceptibility of Overhead Lattice Transmission Towers: Collected Papers 1993-1 – 2003 (Turnbull and McAulay, 2015)[6], this does not necessarily mean significant effects

[6] Mark Turnbull Landscape Architects (2015). Perceptibility of Overhead Lattice Transmission Towers: Collected Papers 1993-1 – 2003 (2015), Turnbull and McAulay.

would be found at that distance. Given the existing OHL forms the current baseline, and the Proposed Development is for its removal, the Study Area is based on potential visual effects of construction activities rather than the OHL itself.

4.3.13 The visibility of construction activities will vary due to the influence of landform, woodland and commercial forestry, and the locations of visual receptors. As set out in the introduction, the Study Area for the appraisal of visual effects is limited to Glen Finart, Stronchullin and Strath Eachaig, and within 2 km of the proposed access track to the east of Loch Long.

4.3.14 As set out in the introduction, the Study Area for the appraisal of landscape effects is limited to Glen Finart, where construction activity is concentrated within a sensitive landscape.

Baseline Data Collation

4.3.15 Information has been gathered primarily from a site survey and desk study.

4.3.16 Relevant publications that have been taken into consideration include:

- NatureScot's Scotland Landscape Character Types[7];
- NatureScot's Loch Lomond & the Trossachs National Park (LLTNP) Landscape Character Assessment Landscape Evolution and Influences[8];
- Scottish Natural Heritage's (SNH) LLTNP Landscape Character Assessment[9];
- SNH's 2010 The Special Landscape Qualities of LLTNP[10];
- Historic Environment Scotland's Inventory Garden & Designed Landscapes[11]; and
- online mapping including Ordnance Survey maps, Google Earth Pro and Google Street View.

4.3.17 Site visits were undertaken to corroborate the desk-based study and to capture photography from selected representative viewpoints. The site visits were conducted in March and May 2022. Weather conditions were generally dry and clear, with a slight reduction in long-distance visibility towards the end of the day in March.

Limitations and Assumptions

4.3.18 The appraisal has been carried out by assuming the worst case of greatest visibility i.e. on a clear, bright winter's day with no screening from deciduous foliage.

4.3.19 The appraisal of visual effects on residential receptors has been undertaken from publicly accessible locations only. Assumptions have therefore been made on the main outlooks and importance of views from these properties.

4.4 Baseline Environment – Landscape

Glen Finart Landscape

4.4.1 The landscape of Glen Finart is characterised by steep-sided, craggy topped mountains divided by a deep u-shaped glen, the eastern edge of which is bound by Loch Long. To the north, Creachan Mòr rises up to 657 m Above Ordnance Datum (AOD) and to the north Beinn Ruadh (664m AOD) and Stronchullin Hill (548m AOD) enclose Glen Finart.

[7] NatureScot (2019). Scottish Landscape Character Types Map and Descriptions. Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions
[8] NatureScot (2019). Landscape Character Assessment LLTNP Landscape Evolution and Influences
[9] Scottish Natural Heritage (2010). LLTNP Landscape Character Assessment
[10] Scottish Natural Heritage (2010). Commissioned Report 376 – The Special Landscape Qualities of LLTNP
[11] Historic Environment Scotland, https://portal.historicenvironment.scot/designation/GDL00056

4.4.2 The glen floor is farmed. Extensive conifer plantations dominate the lower slopes that enclose the glen. Mixed through the plantations are remnants of native deciduous woodland, generally birch-dominated on the upper slopes and burn sides and oak woodland on the lower slopes, typically along watercourses. The upper hillsides are predominantly open moorland, with rock outcrops on upper slopes and summits. Glen Finart Burn is a feature along the glen floor, lined with trees and small blocks of broadleaf woodland.

4.4.3 Glen Finart is lightly settled, with a mix of farmsteads, scattered residential properties, campsites and holiday accommodation. An unnamed road runs along the southern side of the glen. There are a number of core paths, promoted walks and routes, predominantly on the glen sides and shores of Loch Long, and up to the summit of Beinn Ruadh.

Designated and Protected Landscapes

National Parks

4.4.4 The National Parks in Scotland are established under the provisions of the National Parks (Scotland) Act 2000. The Act sets out four National Park aims, to:

- conserve and enhance the natural and cultural heritage of the area;
- promote sustainable use of the natural resources of the area;
- promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and
- promote sustainable economic and social development of the area's communities.

4.4.5 Where these aims conflict, the National Park authority must prioritise the first of these aims.

4.4.6 The majority of the Study Area falls within the LLTNP which was established in 2002.

4.4.7 NatureScot Commissioned Report 376 *The Special Qualities of the Loch Lomond and The Trossachs National Park* [12] identifies that the National Park is composed of a number of landscapes of differing character, each with their own special qualities. The Study Area lies within the Argyll Forest Landscape Area.

Forest Parks

4.4.8 Forest Park is not a formal designation, it is a 'badge' or 'label' originally attributed by the Forestry Commission to areas of attractive forest under its control. It is used by Forestry and Land Scotland to promote forest areas of particular attractive quality and tourist and informal recreation interest. The Argyll Forest Park (hereafter called the 'Forest Park') was established in 1935 and overlaps with the National Park. Within the Study Area it covers the area between the River Eachaig and Loch Long.

Landscape Character

4.4.9 The landscape character of the Study Area has been assessed several times in reports for Scottish Natural Heritage (SNH, now NatureScot), initially in 1996 as part of the Argyll & Firth of Clyde Landscape Character Assessment (LCA)[13], then the area covered by the LLTNP was assessed in 2005 for the LLTNP LCA[14] which was revised and updated in partnership with the Loch Lomond & the Trossachs National Park Authority (LLTNPA) in 2010. In 2019 NatureScot reviewed and consolidated the various local and regional assessments commissioned since the late 1980s to produce a national landscape character

[12] Scottish Natural Heritage and Loch Lomond and The Trossachs National Park Authority (2010). The special landscape qualities of the Loch Lomond and The Trossachs National Park. Scottish Natural Heritage Commissioned Report, No.376 (iBids and Project no 648). Available at: https://www.nature.scot/naturescot-commissioned-report-376-special-landscape-qualities-loch-lomond-and-trossachs-national

[13] Scottish Natural Heritage (1996). Landscape Assessment of Argyll and the Firth of Clyde: Nature Scot Review 78

[14] Scottish Natural Heritage (2010). Landscape Character Assessment: Loch Lomond and the Trossachs National Park REV140

map and database. Part of the consolidation included devising a consistent level of scale and detail between assessments undertaken at different times and scales.

4.4.10 Glen Finart falls within the Nature Scot Landscape Character Type (LCT) 253: Straths and Glens, enclosed by LCT 250: Steep Ridges and Hills. With respect to the LLTNP LCTs, Glen Finart falls within LCT 14: Farmed Strath and Glen Floors enclosed by Wooded and Forested Glen Sides, as illustrated on **Plate 4.1.**

4.4.11 Considering the various assessments and the scale at which the landscape is experienced when travelling slowly through the Study Area, for the purposes of this appraisal the landscape of Glen Finart has been considered as a distinct area with its own sense of place, referred to as landscape unit (LU). The Glen Finart LU comprises a farmed glen floor and the enclosing forested and wooded glen sides. The floor of Glen Finart and its enclosing forested hillsides have characters in themselves but are experienced together as an enclosed valley giving onto Loch Long

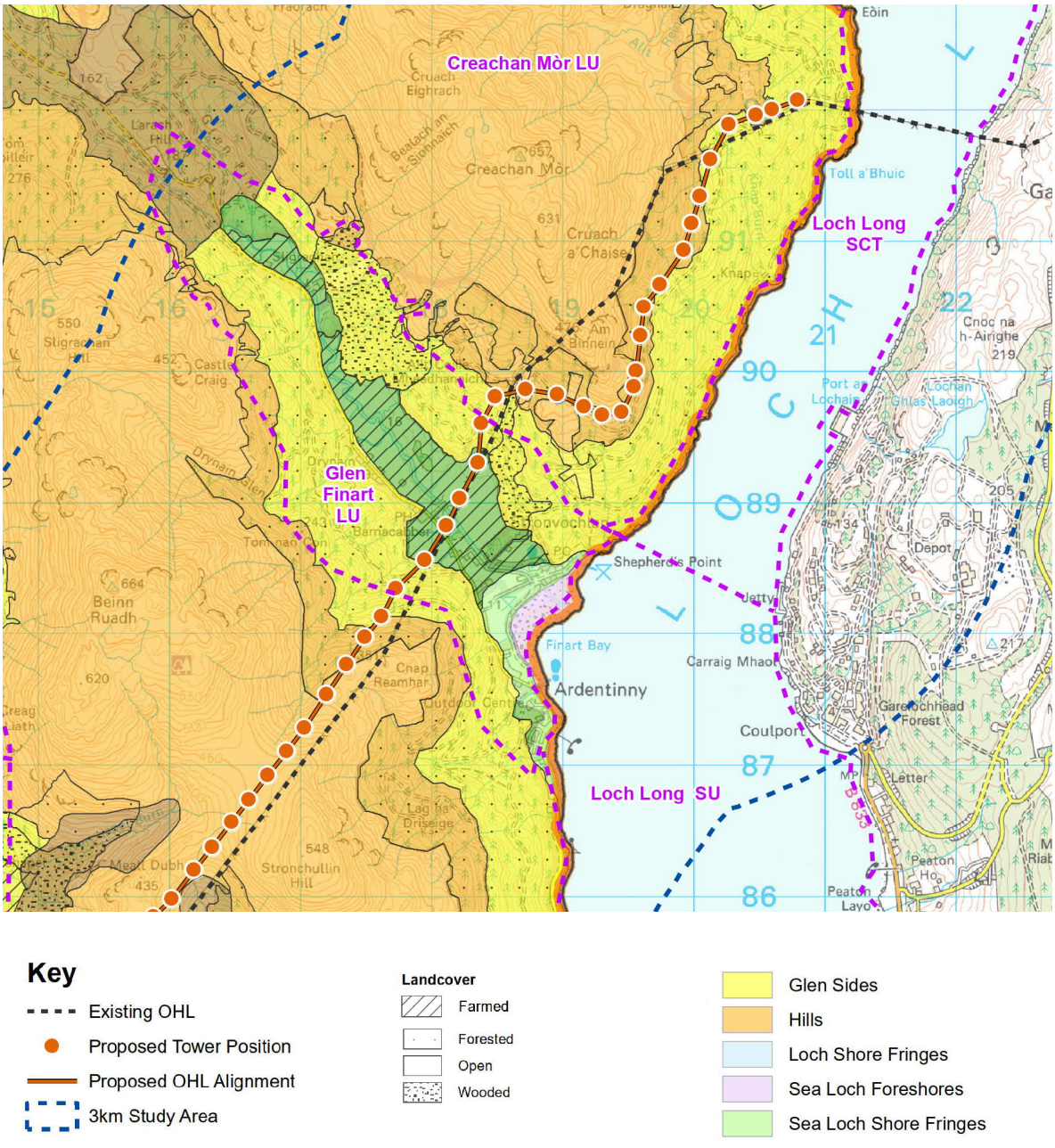


Plate 4.1: Glen Finart Landscape Unit comprising predominantly of Farmed Glen Floor LCT and Forested and Wooded Glen Sides LCTs

4.5 Baseline Environment – Visual Conditions

Visual Amenity

4.5.1 The extent of visibility of the construction phase of the Proposed Development, and thus the area from which there may be visual effects, is predominantly localised around each individual tower. Due to the temporary and localised nature of the visual effects at each tower, these have been scoped out of the LVA, with the exception of construction works within Glen Finart, Stronchollin and Strath Eachaig. The construction and helicopter operation compounds are located on the glen and strath floors and settled coastal zone where the landscape is more open and accessible, and where there is a greater concentration of sensitive receptors and views may be constrained or focussed.

4.5.2 The Proposed Development is located in an area with varied levels of access, with settlements and transport routes typically located within the Glens and Straths, and along the coast between Kilmun and Blairmore. There are core paths and recreational routes within the glens and straths and on the glen sides.

4.5.3 The baseline appraisal identified that the Proposed Development would be visible from the following key visual receptors, which can be classified according to their reasons for being there, as:

- residential receptors - both scattered individual properties and small settlements;
- recreational and tourist receptors - people using the countryside for outdoor recreation and visiting the area as tourists;
- transport receptors - people travelling through the area on major and minor roads; and
- commercial receptors – people at their place of work.

4.5.4 The majority of commercial receptors in the Study Area, such as farms and B&Bs are also residential and are covered as such. There are a small number of purely commercial receptors but they are of low sensitivity to the Proposed Development and have therefore been scoped out of the appraisal.

4.5.5 The nature of the views available of the Proposed Development is generally determined by a combination of topography and forestry cover, with forestry cover varying according to the regime of felling, restocking and maturing associated with commercial forestry.

Plate 4.2: View from the road through Glen Finart, north of Glenfinart Caravan Park, looking north-east towards the existing OHL passing through woodland and forestry.

4.5.6 The Proposed Development passes close to the residential receptors listed above where it crosses Glen Finart, Strath Eachaig and the valley of the Little Eachaig and at Stronchullin.

4.5.7 Most of the tourist and recreation receptors are on the low ground of Glen Finart and Strath Eachaig, or on the flanks of these valleys. Road users include the A815 between Sandbank and Loch Eck, the A880 between the A815 and Kilmun, the minor road to Glen Massan and the minor road through Glen Finart. Road users include cyclists using the Dunoon to Portavadie cycle route, which was formerly designated as National Cycle Network Route 75.

Plate 4.3: View from the A815 entering Loch Lomond and the Trossachs National Park from Sandbank and Dunoon, looking north-east towards the existing OHL on the skyline and down the glen sides, across Strath Eachaig

4.6 Future Baseline

4.6.1 The existing landscape and visual baseline is envisaged to be relatively stable. No major changes are envisaged that would mean that the future baseline is substantively different to the present-day baseline described above.

4.6.2 With respect to proposed developments that have been identified as forming part of the future baseline, two residential developments and one tourist development have been identified. These developments introduce additional residential and recreational receptors, at Sandbank, Strath Eachaig on the edge of Sandbank and within Glen Finart.

4.7 Sensitive Receptors

Sensitive Landscape Receptors

4.7.1 The sensitive landscape receptor appraised within this EA is the Glen Finart LU.

Sensitive Visual Receptors

4.7.2 The sensitive visual receptors that lie within the Study Area illustrated include:

Residential Receptors

- Villages and hamlets:
  - Invereck;

  - Dalinlongart; and
  - Rashfield.
- Scattered residential properties:
  - in Glen Finart;
  - at Stronchullin; and
  - across Strath Eachaig.

Recreational and Tourist Receptors

- Users of multiple promoted trails, mainly associated with the Forest Park;
- visitors to campsites and holiday parks:
  - in Glen Finart; and
  - along the A815 south of Loch Eck to Dunoon;
- visitors to Finart Bay / Ardentinny beach; and
- users of core paths throughout the area.

Transport Receptors

- Main road users:
  - A815;
  - A885;
  - A880; and
  - B836.
- minor road users:
  - from Ardentinny along Glen Finart.

4.8 Mitigation

Embedded Mitigation

4.8.1 Mitigation measures will predominantly be set out in the CEMP by the Principal Contractor, which will establish Construction Good Practice mitigation measures, such as site management to reduce visual clutter associated with the works and use of construction lighting in accordance with best practice to minimise lighting intrusion to surrounding sensitive receptors.

4.9 Appraisal

Introduction

4.9.1 Due to the nature of the Proposed Development, the appraisal primarily considers the potential visual effects of the Proposed Development on visual amenity within Glen Finart, Stronchullin and Strath Eachaig. The appraisal also considers the temporary effects on visual amenity of the construction works to the east of Loch Long, and temporary landscape effects on Glen Finart during the construction phase.

Construction Phase

4.9.2 During the construction phase of the Proposed Development, the following activities and elements will be required which are likely to result in landscape and visual effects:

- upgrade works for Towers 12 to 15, including access track upgrade and a new access track to Tower 12;
- reconductoring works across Loch Long, including the creation of two EPZ;
- re-use of existing construction compound to the west of Loch Long and creation of a new compound to the east of the loch, the location of which is not known at this time;
- a 'rolling' arrangement of small sub yards, offices and welfare facilities, which will generally be re-use of sites used for the new OHL construction;
- creation of ATV routes with an indicative width of 5 m, including a new permanent access track to the east of Loch Long;
- installation of scaffolds and crossings where the OHL crosses major roads or built up areas;
- dismantling the existing towers using winch and cable drums to remove conductors and cutting and felling towers, and breaking up and burying feet and foundations;
- extraction of conductors and towers using ATV and/or helicopters;
- creation of four helicopter operation compounds, as indicated on **Figure 1.2: Site Layout**; and
- reinstatement of all construction sites and re-vegetation of all construction compounds, etc.

Construction Effects on Landscape Character

4.9.3 Effects on the landscape character of Glen Finart LU are inevitable during the construction stage due to the introduction of busy, noisy construction compounds and helicopter operation compounds on the glen floor. The use of the compounds during the dismantling phase of the Proposed Development will result in movement and noise of vehicles, including helicopters, storage of material, welfare facilities and vehicle movements in and out of the glen. The glen is generally lightly settled and tranquil and therefore there will be a change to the landscape character of the glen.

Glen Finart Landscape Unit

Landscape Overview

4.9.4 Glen Finart LU comprises the farmed glen floor and the enclosing forested and wooded glen sides. Glen Finart LU forms part of the Straths and Glens National LCT, which is characterised by broad u-shaped glens many of which have forested glen sides, with scattered trees and remnants of native woodland along the edges of burns. The glen floors are farmed with improved pastures and settlements and farms are located on lower side slopes where they are raised above the floodplain. Road corridors follow the edges of the glen floors and towers, and low voltage power lines are described as being highly visible features across open glen floors. The LU falls entirely within the National Park and the majority of the woodland has been identified as Ancient Woodland. A scheduled monument and listed buildings add to the cultural heritage of the glen, although it is also influenced by tourism infrastructure and the existing OHLs.

Landscape Sensitivity

4.9.5 Overall, the value of the LU is considered to be High-Medium. The susceptibility of the Glen Finart LU to the type of development proposed is considered to be Medium due to the sensitivity of the relatively tranquil open glen floor to large scale construction activities and infrastructure. Overall, the sensitivity of the LU to the type of development proposed is High-Medium.

Plate 4.4: View from bridge over Glen Finart burn looking north-east towards the existing OHL and proposed Helicopter Operations Compounds.

Appraisal

4.9.6 The location of helicopter operation compounds, and potentially a main construction compound and/or yard, together with the dismantling and helicopter operations associated with the Proposed Development are likely to affect the tranquillity of the glen. However, the dismantling phase is likely to be over 5 months, and less than 12 months, and therefore is temporary and short-term in nature. Therefore, a temporary Minor magnitude of effect (change) on Glen Finart LU is likely to occur, which is of High-Medium sensitivity. This would result in a Minor adverse effect during the Construction Phase.

Construction Effects on Visual Amenity

4.9.7 People notice movement and active change more than they notice fixed objects. The noise and movement would be particularly apparent with respect to the helicopter operations associated with towers that would be removed by helicopter, working out of locations on the Glen Finart floor and at Stronchullin. The main construction compound, yards and helicopter operation compounds will introduce areas of greater activity, including machinery, stockpiles and welfare facilities, and are likely to be located in more accessible areas, such as Glen Finart, Stronchullin and Strath Eachaig where they are visible to a greater number of visual receptors than the majority of the existing towers. Therefore, the LVA focuses on visual receptors within Glen Finart, Stronchullin and Strath Eachaig.

4.9.8 The construction activities will be more intensive and disruptive within the main construction compound and helicopter operation compounds and their surroundings than the 'rolling' yards and construction activities associated with each tower, where construction activities will be localised and of a short duration. With respect to the main construction compound and helicopter operation compounds, the

dismantling phase is likely to be over 5 months, and less than 12 months and is therefore temporary and short-term in nature.

Residential Receptors

4.9.9 Residential receptors – people enjoying the view from their home – are usually considered to be highly susceptible to visual change and are therefore considered to be of high sensitivity even where the actual view enjoyed may not be particularly valued.

4.9.10 Residential receptors in Glen Finart include houses at Stronvochlan and scattered residential properties along the glen floor adjacent to the minor access road as illustrated in **Plate 4.5**.

4.9.11 The residential property opposite Barnacabber Farm (now Glenfinart Hotel and Deer Farm) is in close proximity to the existing OHL alignment and Proposed Development and is oriented north-east with views across the glen floor, and towards the existing OHL. The existing OHL alignment passes within approximately 95 m to the south-east of the property, although this is oblique to the orientation and set within woodland. To the north-east, the existing tower is located approximately 247 m from the property, with filtered views of the tower beyond the deciduous trees along Glen Finart Burn. The Proposed Development would remove the existing conductors and towers and introduce three helicopter operation compounds onto the floor of Glen Finart, with two to the north-east and one to the south of the property, with potential for additional yards and/or a main construction compound.

4.9.12 Given the proximity of the Proposed Development to the property and extent of the views that will be affected, along with the temporary and short-term nature of the construction phase, residents at the property are likely to experience a Low magnitude of effect (change) which would result in a Moderate adverse effect during the Construction Phase.

4.9.13 The remaining residential receptors within Glen Finart are located a greater distance from the Proposed Development and generally benefit from a greater degree of screening and are not oriented directly towards the Proposed Development. Therefore, a Negligible magnitude of effect (change) is likely to occur, resulting in a Minor adverse effect during the Construction Phase.

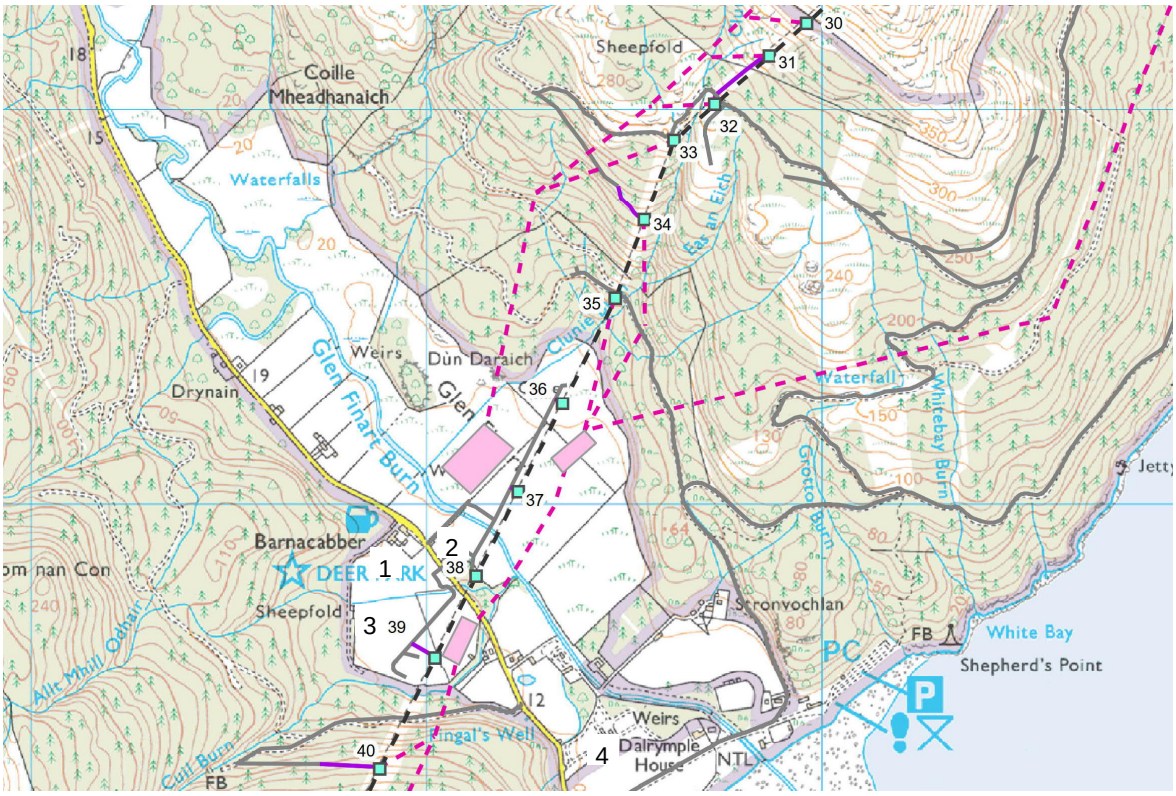


Plate 4.5: Visual Receptors at Glen Finart with Site Layout showing proposed Helicopter Operations Compounds (pink areas) and Routes (pink dashed lines)

1 – Barnacabber Farm and Culzean House

2 – House opposite Barnacabber Farm

3 – Proposed Barnacabber Holiday Homes

4 – Glen Finart Caravan Park

4.9.14 Residential receptors in Strath Eachaig include houses at Rashfield, Uig Dalinlongart and scattered residential properties along the strath floor as well as residents at Sandhaven, as illustrated in **Plate 4.6**.

4.9.15 Residents at the hamlet of Rashfield on the floor of Strath Eachaig are located within approximately 45 m of the existing OHL alignment, which passes between tourist accommodation on the northern edge of Rashfield. The residential properties vary in the orientation, with filtered views from the properties on the western edge of Rashfield of the existing OHL alignment seen through the deciduous trees along the River Eachaig.

4.9.16 On the western edge of Strath Eachaig, in and around Dalinlongart, and on the north-western edges of Sandhaven, residents are located in close proximity to the existing OHL where it crosses the open strath floor and Little Eachaig River. Vegetation associated with the river corridor and the scattered farmsteads and access tracks help to screen and filter views of the existing OHL alignment, but a number of properties have largely open views of the existing OHL alignment, albeit in the context of other overhead lines and residential properties and farmsteads, with approximately three residential homes located in very close proximity (as near as 28 m) to existing towers.

4.9.17 It is not known where construction compounds and/or yards would be located, however residents in close proximity to the existing OHL are likely to experience a Negligible magnitude of effect (change) due to the localised and temporary nature of construction activities associated with the removal of conductors and towers. Therefore, a Minor adverse effect during Construction is likely to occur for residents in close proximity to the Proposed Development, with Negligible adverse to Neutral effects for most residents of Strath Eachaig during the Construction Phase.

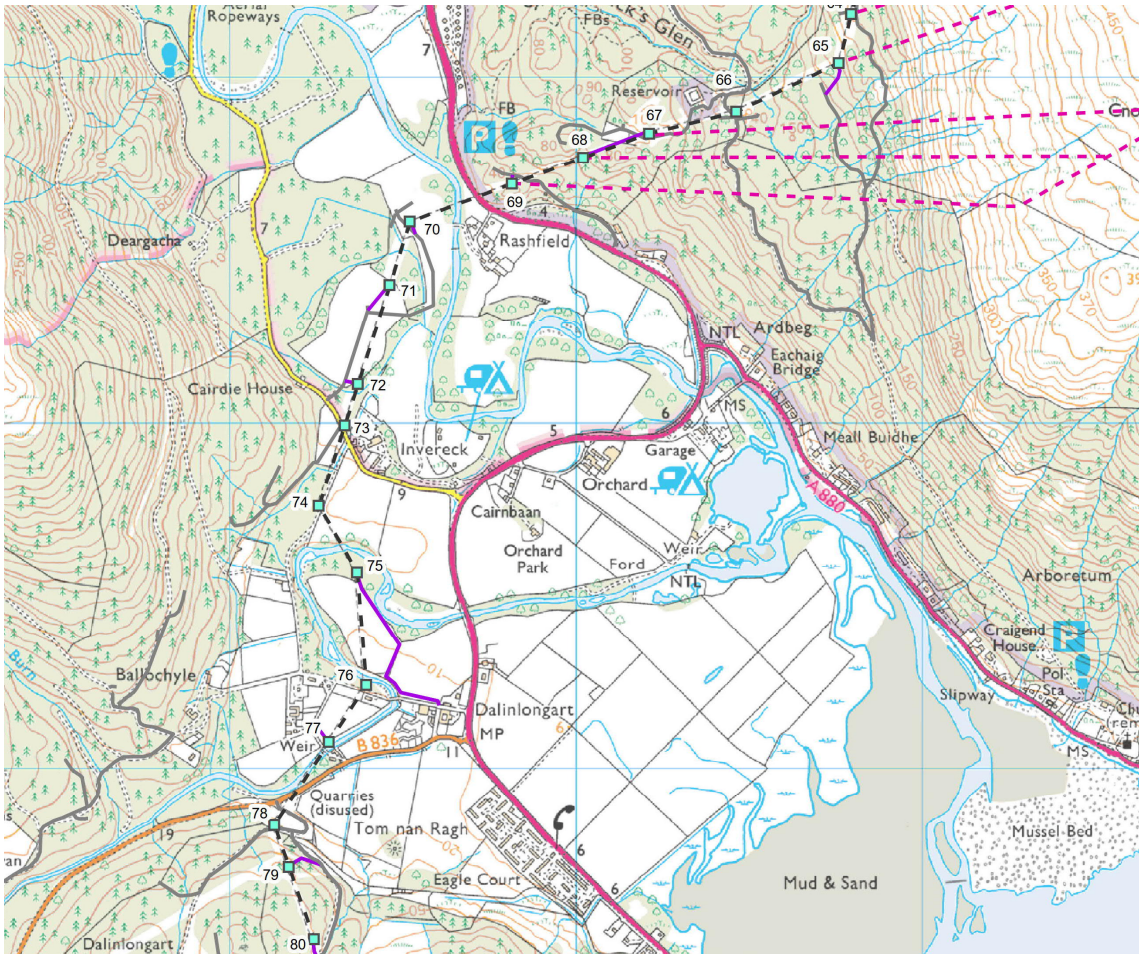


Plate 4.6: Visual Receptors at Strath Eachaig with Site Layout showing proposed Helicopter Routes (pink dashed lines)

Recreational Receptors

4.9.18 Recreational receptors may be of low, medium, or high sensitivity depending on the context, with recreational receptors within designated landscapes, such as the National Park, of higher sensitivity as a result of the higher value of the view. People enjoying outdoor recreation where the view is important to the experience are normally considered to be of High sensitivity. People hill walking and using promoted trails are generally there to enjoy the view. Where the focus is more on the activity itself and the view is less important to the experience, they may be considered to be of Medium or even Low sensitivity. Walkers within the National Park and users of promoted trails and core paths are considered to be highly sensitive to changes in visual amenity.

4.9.19 The effects on visual amenity of the Proposed Development are predominantly localised around the base of each tower, which are typically visually contained by existing commercial forest or woodland, or within remote areas where away from the main paths and trails. The main visual effects likely to arise are within Glen Finart, where the existing OHL crosses the relatively open glen floor and three helicopter operation compounds are proposed.

Views of the Proposed Development experienced by users of promoted trails and core paths within Glen Finart are transient and frequently screened and filtered by existing woodland, particularly in summer. Therefore, given the temporary nature of the Proposed Development, a Negligible to Neutral magnitude of effect (change) is likely to occur, on recreational receptors who are of High-Medium sensitivity, resulting in a Negligible adverse to Neutral significance of effect during construction.

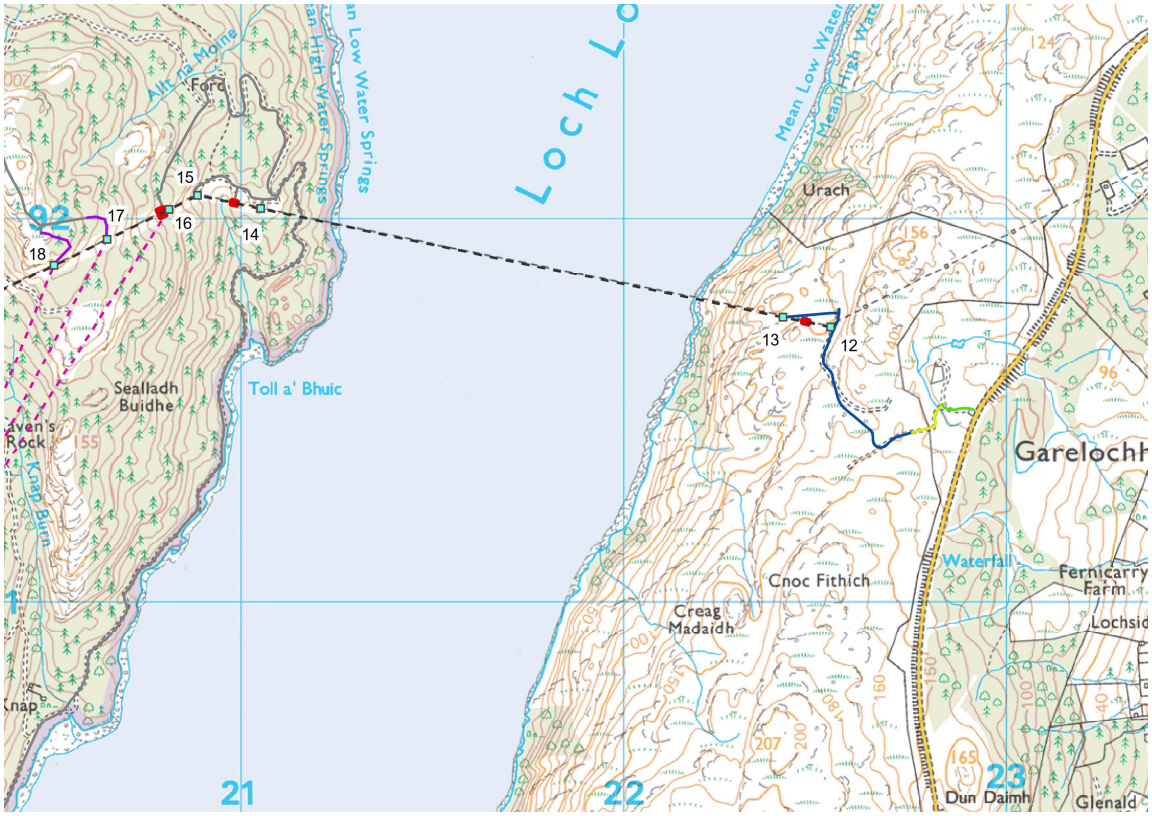


Plate 4.7: Visual Receptors of proposed access track to east of Loch Long

1 – Core Path 2 – Loch Long

4.9.20 Recreational receptors likely to be affected by the construction works to the east of Loch Long including the implementation of the proposed access track, see Plate 4.7, include users of the Core Path along the western edge of Loch Long, where openings in the woodland and forestry enable views towards the Site, and recreational users of Loch Long in the vicinity of the Site. Construction of the proposed access track would be seen over a distance of at least 1.38 km, forming a small part of the wide view, and would be temporary and occasional views from along less than 1 km of the route. Therefore, no substantial visual effects are likely to occur during Construction.

4.9.21 Recreational users of Loch Long will experience more open views of the construction activity to the east of Loch Long, although the screening effect of landform and vegetation increase as one approaches the eastern shore of Loch Lomond. Views of the construction activity to the east of Loch Long would be peripheral to the main focus of views, which are channelled along the loch. Therefore, no substantial visual effects are likely to occur during construction.

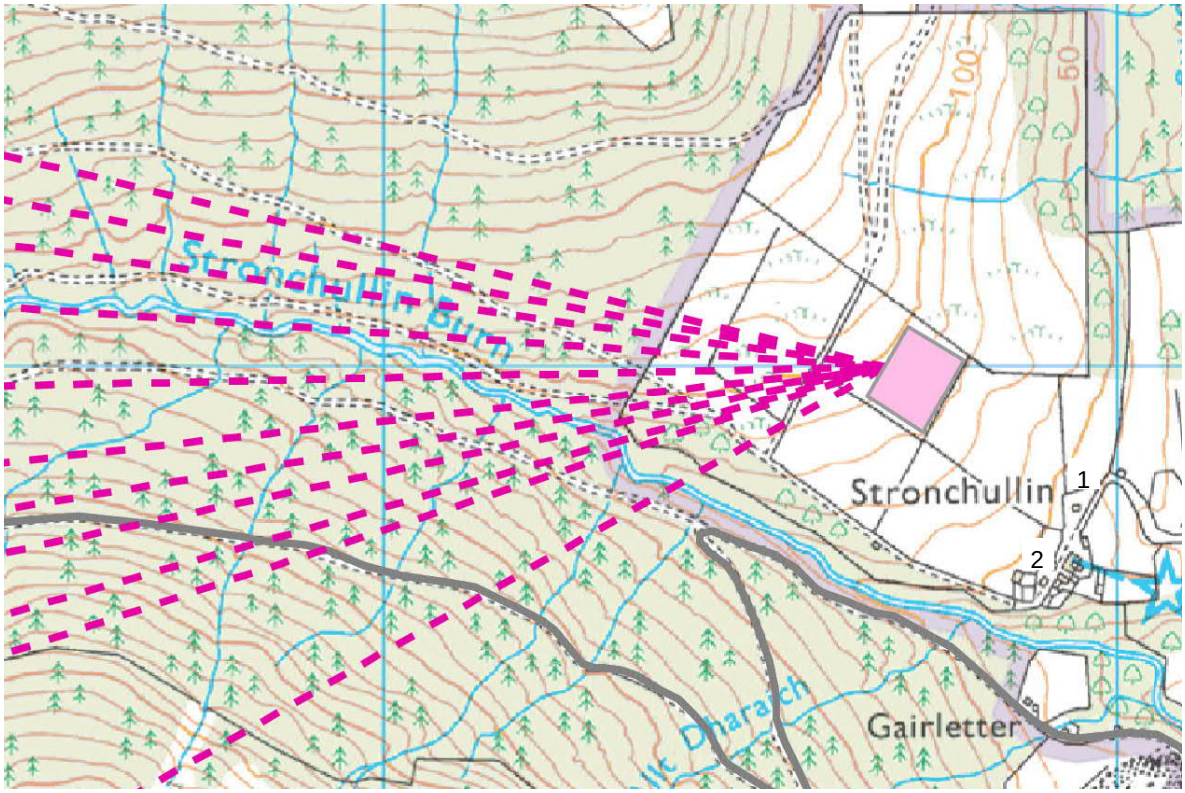


Plate 4.8: Visual Receptors at Stronchullin with Site Layout showing proposed Helicopter Operations Compound (pink area) and Routes (pink dashed lines)

1 – Stronchullin Holiday Cottages 2 – Quadmania

Users of Tourist Accommodation

4.9.22 The sensitivity of accommodation users depends on their context. Users of holiday homes and B&Bs may generally be considered to be of Medium to High sensitivity - similar to permanent residents but slightly reduced because of the temporary nature of the accommodation use. Recreational receptors at campsites and holiday parks may be considered to be of Medium sensitivity as the high value attached to the view is balanced against a lower susceptibility due to the setting being experienced in the context of a campsite or holiday park with the associated built form and man-made infrastructure.

Culzean House (at Barnacabber Farm)

4.9.23 Culzean House is located on the edge of the largely open glen floor, approximately 200 m to the north-west of the existing OHL. The Proposed Development removes the conductors and towers, and introduces three helicopter operation compounds onto the glen floor to the north-east and south of the property. Views of the existing OHL, particularly where the OHL is nearest to Culzean House, are peripheral to the main views of the House, and partially screened by woodland to the south-east and east. However, there are more open views of the proposed helicopter operation compounds, particularly to the south. Overall, a Low-Negligible magnitude of effect (change) is anticipated during the construction phase, on a receptor of Medium-High sensitivity resulting in a Minor adverse visual effect.

Stronchullin Holiday Cottages

4.9.24 Users of the Stronchullin Holiday Cottages, located above the shores of Loch Long, alongside Stronchullin Burn and adjacent to Quadmania are considered to be of Medium-high sensitivity. The cottages are predominantly oriented towards Loch Long, with trees providing some enclosure to views up the glen towards the proposed helicopter operation compound, see **Plate 4.8.** The proposed compound is located within a field above the cottages, with landform providing some additional screening. There is no other intervisibility between the Proposed Development and the cottages, and given the temporary and short-lived nature of the Construction Phase, a Negligible magnitude of effect (change) is likely to occur, resulting in a Minor-Negligible adverse effect on users during construction.

Proposed Holiday Dwellings Complex at Barnacabber Farm

4.9.25 Users of the proposed holiday dwellings at Barnacabber Farm, located on the floor of Glen Finart, are considered to be of Medium-high sensitivity. They will have open views of the existing OHL and will experience near-distance open views of the proposed helicopter operation compound during construction. There will be limited intervisibility between the cottages and compounds to the east of Glen Finart Burn due to existing vegetation. Given the temporary and short-lived nature of the Construction Phase, a Low-Negligible magnitude of effect (change) is likely to occur, resulting in a Minor adverse effect on users of the holiday cottages during construction.

Glenfinart Caravan Park

4.9.26 Glenfinart Caravan Park is located on the largely open glen floor, approximately 415 m from the existing OHL. The Proposed Development removes the existing conductors and towers, and introduces three helicopter operation compounds onto the glen floor to the north and north-west of the caravan park. Views of the existing OHL alignment and the Proposed Development are partially screened by existing trees and buildings on the glen floor. Therefore, a Low-Negligible magnitude of effect (change) is likely to occur during the Construction Phase. Given the Medium sensitivity to visual change, a Negligible effect on visual amenity is likely to occur.

Rashfield Shielings, Strath Eachaig

4.9.27 The existing OHL passes through the tourist accommodation at Rashfield Sheilings on the floor of Strath Eachaig, with the nearest tower approximately 183 m to the west beyond the River Eachaig. The Proposed Development will remove the conductors and tower, with scaffolding likely to be temporarily erected to protect the properties and A815 crossing.

4.9.28 Given the localised and temporary nature of the Proposed Development, a Low-Negligible magnitude of effect (change) to the tourism visitors at Rashfield Sheilings, who are of Medium sensitivity to visual change is likely to occur. This would result in a Minor adverse effect during construction.

Ballochyle Cottage, Strath Eachaig

4.9.29 The existing OHL passes within approximately 107 m of Ballochyle cottage as it crosses the Little Eachaig River and the open strath floor, formerly Ballochyle Farmstead and now self-catering accommodation. Vegetation associated with the former farmstead and river corridor partially screen and filter views of the existing OHL, however there are likely to be some views of the existing OHL alignment from the property.

4.9.30 The Proposed Development will remove the conductors and tower, with a small section of new track required to access Tower 77. Assuming no yards or the main construction compound are located in close proximity to the cottage, a Low-Negligible magnitude of effect (change) to the tourism visitors at Ballochyle Cottage, who are of Medium-High sensitivity to visual change is likely to occur. This would result in a Minor-Negligible adverse effect during construction.

4.10 Summary

4.10.1 The Proposed Development would result in only temporary landscape and visual effects, with the exception of the proposed access track. Although the Site covers a large area, the majority of the effects are localised, concentrated around the individual towers where they are largely contained by the surrounding vegetation and landform. The main landscape and visual effects likely to arise are associated with the construction compounds, in particular the concentration of helicopter operation compounds and associated construction activity within Glen Finart.

4.11 Recommendations & Mitigation

4.11.1 No specific mitigation measures have been identified due to the limited potential for significant landscape and visual effects arising from the Proposed Development. The implementation of a CEMP will ensure that best practice standards are used during the construction and reinstatement periods which will assist in minimising landscape and visual effects and the location of the main construction compound and yards should be informed by sensitive landscape and visual receptors.

4.11.2 General mitigation measures recommended to address potential adverse landscape and visual effects are: to minimise the extent of construction platforms and compounds and; to locate them away from sensitive landscape and visual receptors. Where this is not possible, it may be feasible to provide landscaping bund out of stripped soils for example.

5. CULTURAL HERITAGE

5.1 Introduction

5.1.1 This section presents the results of the cultural heritage appraisal which has been undertaken on the Proposed Development. Cultural heritage comprises a diverse range of elements that are referred to throughout the appraisal as heritage assets.

5.1.2 Heritage assets are features created, or that have undergone modification from human agency. This includes a wide range of visible and buried archaeological sites and monuments, as well as other historic features or places. Heritage assets comprise World Heritage Sites, Scheduled Monuments, Listed Buildings, Gardens and Designed Landscapes (GDL), Battlefields, Conservation Areas, Marine Protected Areas, other underwater sites, buried archaeological remains, other historic buildings, and earthworks.

5.1.3 Additional information which supports this section is presented in the following figures and technical appendices:

- Figure 1.2 Site Layout;
- Figure 5.1 Heritage Assets; and
- Appendix E – Cultural Heritage Gazetteer.

5.2 Information Sources

5.2.1 The appraisal has been informed by a review of all available archaeological records, historical documentary evidence, cartographic evidence, and photographic material. This has involved a consultation of the following sources:

- GIS data on Scheduled Monuments, Listed Buildings, and GDLs was obtained from Historic Environment Scotland (HES).
- GIS data on other heritage assets was obtained from the Scottish National Record of the Historic Environment (SNRHE), which is maintained by HES.
- Information from the Argyll and Bute Council Historic Environment Record (HER), managed by the West of Scotland Archaeology Service (WoSAS).
- Readily accessible primary and secondary historical sources for information relating to the area's historical past, including past land use.
- Pre-Ordnance Survey maps of the Study Area, available online from the National Library of Scotland (NLS). The relevant maps date in range from the seventeenth to the nineteenth centuries[15].
- First and subsequent editions of the Ordnance Survey (OS) maps of the Study Area, examined via the NLS.
- LIDAR datasets of the general area through the Scottish Remote Sensing Portal maintained by the Scottish Government[16].
- The solid and drift geology for the Study Area based on that recorded by the British Geological Survey/Geological Survey of Great Britain maps[17].

5.2.2 Walkover surveys of the Site were carried out between 5th and 8th November 2018, and 2nd May 2023 in order to:

- assess the baseline condition of the known heritage assets;

[15] National Library of Scotland Maps Viewer (2021). Available at: https://maps.nls.uk/
[16] Scottish Remote Sensing Portal. Available at: https://remotesensingdata.gov.scot/data#/map
[17] BGS (2021) Geology of Britain viewer (classic) [online]. Available at: https://mapapps.bgs.ac.uk/geologyofbritain/home.html

- identify any further heritage assets not detected through the desk-based assessment that could be affected by the Proposed Development; and
- identify areas with the potential to contain currently unrecorded sub-surface archaeological remains.

Limitations and Assumptions

5.2.3 The appraisal is based on the Proposed Development as presented at the time of compiling this report. Any comments received on this document from HES or WoSAS may inform any future appraisal or investigations that may need to be undertaken.

5.2.4 The baseline information gathered for the appraisal was extensive but not exhaustive, thus there remains the possibility that there may be heritage assets of archaeological or historical significance that have not been identified.

5.3 Methodology

Study Area

5.3.1 To appraise the effect of the Proposed Development on cultural heritage, a Study Area of 300 m extending out from the existing OHL alignment was applied for the identification of all designated and non-designated heritage assets that could be physically impacted upon. The locations of any new access tracks or temporary construction work areas outside the Study Area (see **Figure 1.2 Site Layout**) were also reviewed, and any heritage assets within these areas were included within the baseline.

5.3.2 Although the focus of this chapter is on the Proposed Development, a wider, archaeological contextual background is presented for the general area. The study of the surrounding landscape was necessary to establish the local archaeological and historical context, to provide a broader understanding of the historical development of the Proposed Development and the potential for as-yet-unidentified archaeological remains within the boundary of the Site.

Terminology

5.3.3 The technical terminology applied to the appraisal process is based on that contained within the fourth National Planning Framework (NPF4)[18].

Standards and Guidance

5.3.4 All elements of the appraisal have been undertaken in accordance with the following policies and guidelines:

- Standards and Guidance for Historic Environment Desk-Based Assessment[19];
- Standards and Guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment[20];
- Fourth National Planning Framework;
- Designation Policy and Selection Guidance[21];
- Managing Change in the Historic Environment Setting[22]; and

[18] Scottish Government (2023). *Fourth National Planning Framework. Available at https://www.gov.scot/publications/national-planning-framework-4/*
[19] Chartered Institute for Archaeologists (2014). *Standards and Guidance for Historic Environment Desk Based Assessment.*
[20] Chartered Institute for Archaeologists (2014). *Standards and Guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment.*
[21] Historic Environment Scotland (2020). *Designation Policy and Selection Guidance*
[22] Historic Environment Scotland (2020). *Managing Change in the Historic Environment – Historic Environment Scotland's guidance note series*

- West of Scotland Archaeology Service (WoSAS) Procedural Guidance for Archaeology and Development (2009)[23].

Appraisal Methodology

5.3.5 Cultural significance lies in the value of a heritage asset to current and future generations because of its heritage interest. This may be artistic, archaeological, architectural, historic, traditional, aesthetic, scientific, or social. Known and potential heritage assets within the Proposed Development and the Study Area have been identified from the sources listed within **Section 5.2**.

5.3.6 The determination of the cultural significance or value of heritage assets is based on statutory designation and/or professional judgement against the characteristics and criteria expressed in HES Designation Policy and Selection Guidance[24] and the Historic Environment Policy for Scotland 2019[25]. A degree of professional judgement is necessary, guided by acknowledged standards, designations and priorities when evaluating the importance or significance (and hence the 'value') of heritage assets.

5.3.7 The determination of setting has been undertaken in accordance with guidance provided within the Managing Change Guidance[26] (HES, 2016). A three-stage process was undertaken to assess the impact of the Proposed Development on the setting of heritage assets:

- **Stage 1:** Designated and non-designated heritage assets that might be affected by the Proposed Development were identified. The potential for impacts on the designated assets in the wider landscape due to the potential inter-visibility with the Proposed Development were also determined through the desk-based review and site walk-over survey.
- **Stage 2:** The setting of all baseline heritage assets was defined by establishing how the surroundings contribute to the ways in which the asset is understood, appreciated, and experienced.
- **Stage 3:** The way in which the Proposed Development would impact upon setting was then assessed for all baseline heritage assets.

5.3.8 The tables below identify factors which are appropriate to consider during the appraisal of heritage assets, with the adoption of five ratings for value in relation to the heritage assets: very high, high, medium, low, and negligible. **Table 5-1** below sets out the criteria for assessing the value of heritage assets.

Table 5-1: Criteria for assessing the value of heritage assets

Value	Example
Very High	World Heritage Sites (including nominated sites) Heritage assets of acknowledged international importance
High	Scheduled Monuments (including proposed sites) Listed Buildings (Category A and B) Battlefields included within the Inventory Marine Protected Areas Gardens and Designed Landscapes Conservation areas containing nationally important buildings Non-designated heritage assets of scheduled quality and importance Heritage Assets of national importance
Medium	Listed Buildings (Category C)

[23] West of Scotland Archaeology Service (2009). *Procedural Guidance for Archaeology and Development*
[24] Historic Environment Scotland (2020). *Designation Policy and Selection Guidance*
[25] Historic Environment Scotland (2019). *Historic Environment Policy for Scotland*
[26] Historic Environment Scotland (2020). *Managing Change in the Historic Environment Setting – Historic Environment Scotland's guidance note series.*

Value	Example
	Conservation areas containing buildings that contribute significantly to its historic character Heritage assets of regional importance
Low	Heritage assets of local importance Heritage assets compromised by poor preservation and/or poor survival of contextual associations Buildings of modest quality in their fabric or historical association
Negligible	Heritage assets with very little or no surviving archaeological interest Artefact find spots (where the artefacts are no longer in situ and where their provenance is uncertain) Poorly preserved examples of particular types of minor historic landscape features (e.g. quarries and gravel pits, dilapidated sheepfolds, etc)

5.3.9 The criteria for assessing the magnitude of impact from the Proposed Development on a heritage asset is shown in **Table 5-2** below.

Table 5-2: Assessing the magnitude of impacts

Factors in the assessment of Magnitude of Impacts		
	Adverse	Beneficial
Major	Changes to most or all key archaeological materials or key historic building elements such that the resource is totally altered. Comprehensive changes to setting such as extreme visual effects, gross change of noise or change to sound quality, or fundamental changes to use or access.	Preservation of a heritage asset in situ where it would otherwise be completely or almost lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.
Moderate	Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset such as visual change to many key aspects or views, noticeable differences in noise or sound quality, or considerable changes to use or access.	Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.
Minor	Changes to key archaeological materials or key historic building elements, such that the asset is slightly altered. Slight changes to setting such as slight visual changes to few key aspects or views, limited changes to noise levels or sound quality, or slight changes to use or access.	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
Negligible	Very minor changes to archaeological materials, historic buildings elements, or setting. Very minor changes to setting such as virtually unchanged visual effects, very slight changes in noise levels or sound quality, or very slight changes to use or access.	Very minor changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Very minor changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
No Change	No change to fabric or setting.	

5.3.10 The overall impact on a heritage asset is a function of the importance of the attribute and the scale of change. Criteria for determination of the overall impact are shown in **Table 5-3**. For the purpose of this appraisal, overall impacts of Moderate or greater are considered potentially material to the planning

process and described as significant. Overall impacts found to be Slight or less are considered not potentially material and are therefore described as not significant. The word significant is used here in its ordinary English meaning of "worthy of consideration".

Table 5-3: Overall impact

	Factors in the Assessment of Magnitude of Impacts					
		No Change	Negligible	Minor	Moderate	Major
Value	Very high	Neutral	Slight	**Moderate or Large**	**Large or Very Large**	**Very Large**
	High	Neutral	Slight	**Moderate** or Slight	**Moderate or Large**	**Large or Very Large**
	Medium	Neutral	Neutral or Slight	Slight	**Moderate**	**Moderate or Large**
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or **Moderate**
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

5.4 Baseline Environment

Introduction

5.4.1 Details of the heritage assets which lie within the Study Area or within construction areas outside the Study Area, are tabled in **Appendix E: Cultural Heritage Gazetteer** and their locations are indicated in **Figure 5.1: Heritage Assets**.

Site Geology

5.4.2 The bedrock geology underlying the OHL to the south is the Dunoon Phyllite Formation – Pelite, consisting of metamorphic bedrock formed approximately 541 to 1000 million years ago and later altered by low-grade metamorphism[27]. A layer of Loch Katrine Volcaniclastic Formation – Psammite, separates the Dunoon Phyllite Formation from Beinn Bheula Schist Formation – Psammite, that underlies the majority of the OHL.

5.4.3 The superficial geology underlying the OHL is mainly unrecorded, but areas of hummocky glacial deposits consisting of sand and gravel, as well as alluvium, river terrace deposits, and raised marine deposits of sand and gravel are present within the area surrounding the OHL[28].

Designated Heritage Assets

5.4.4 Currently, there are no designated heritage assets identified within the Proposed Development or the 50 m wayleave surrounding it. The 300 m Study Area contains two designated heritage assets:

- Adam's Cave, chambered cairn, Ardnadam (SM6552), Scheduled Monument; and
- Invereck (Church of Scotland eventide home) including outbuildings, boundary walls and gatepiers (LB50432) Category B Listed Building.

5.4.5 There are no designated heritage assets within the construction areas outside the Study Area.

[27] British Geological Survey Viewer (2023).Available at: BGS Geology Viewer (BETA)
[28] British Geological Survey Viewer (2023). Available at: BGS Geology Viewer (BETA)

Non-designated Heritage Assets

5.4.6 There are 22 non-designated heritage assets within the 300 m Study Area, largely consisting of post-medieval settlement and agricultural remains. Of the heritage assets highlighted by the assessment, nine are listed within the SNRHE and local HER, with a further 13 heritage assets discovered through historic map regression and the walkover surveys.

5.4.7 There are no non-designated heritage assets within the construction areas outside the Study Area.

Baseline Environment

5.4.8 The historical background presents a summary of the baseline information provided in **Appendix E: Cultural Heritage Gazetteer** and is focussed on interpreting the information relevant to assessing the potential for encountering as yet unknown archaeological features within the Site and the 300 m Study Area.

5.4.9 The heritage assets within the Study Area are summarised in the context of a timeline of archaeological periods from prehistoric through to modern.

Prehistoric Period (12,000 BCE – CE 400)

5.4.10 The earliest prehistoric inhabitants of Scotland only leave ephemeral traces of their lives within the archaeological record. The people of the Palaeolithic and Mesolithic periods were nomadic hunter gatherers and left little evidence for their existence, with most heritage assets encountered related to flint scatters. Most known heritage assets from this period have been found in coastal regions, with availability of resources the dominant influence on settlement during this period. The location of the Proposed Development on higher ground, albeit close to watercourses and coastal areas, makes it an unlikely location for encountering Mesolithic or earlier activity.

5.4.11 The Neolithic period in Scotland is identified through evidence of the development of more sedentary lifestyles, with seasonal rather than continual movements becoming more evident alongside the growth of farming. The low-lying areas of the River Eachaig valley and Glen Finart would have been the most suitable areas close to the Proposed Development for people to farm and live on. Evidence of a Neolithic community is present outside the Study Area, to the south of Sandbank Substation at Dunloskin Wood.

5.4.12 The nearby chambered cairn of Adam's Cave (SM6552) (HA4) represents a Neolithic burial tradition and is probably related to the settlement to the south, as would be the probable stone circle (WoSAS Pin 53777) (HA1) to the immediate south of the Dunoon Substation. The chambered cairn and stone circle are typical of burial and ritual traditions in the Neolithic period and suggest that the settlement within Dunloskin Wood may have been established for a long period, as chambered cairns typically housed the remains from generations of family or communal groups.

5.4.13 Burial practices change into the Bronze Age with unstructured burial cairns and mounds, and an increase in cremations favoured over the Neolithic chambered cairns. The stone monuments, such as the stone circle at Ardnadam (WoSAS Pin 53777) (HA1) probably continued in use, and settlement evidence from elsewhere in Scotland during this period suggests development of farming practices. None of the heritage assets within the Study Area can definitively be interpreted as Bronze Age in date but there was possibly a continuation of settlement in the areas around Dunoon given its earlier occupation, ideal location for farming due to fertile soils, and the proximity to fresh water and fishing resources.

Roman Period (CE 71 – CE 211)

5.4.14 The Roman occupation of Scotland was short-lived with activity concentrated in southern Scotland. Initial invasions in circa CE 80 and again circa CE 138 left a lasting mark on the landscape where the Romans occupied an area, but there are no known Roman heritage assets within the Study Area.

Medieval (CE 400 – CE 1560)

5.4.15 Evidence of early medieval activity is scarce within the archaeological record, with settlements that would have served the descendants of the Iron Age rare discoveries. Despite the western coasts of Scotland being invaded and inhabited by Vikings in the late first millennium CE, the Study Area does not contain any evidence of this activity.

5.4.16 There is one non-designated heritage asset dating to the end of this period within the Study Area. The heritage asset is recorded as Ardnadam *(*WoSAS ID 45482*)* (HA3) on the HER and SNRHE but refers to the remains of three rectangular buildings labelled as 'Finbracken ruins' on the Ordnance Survey map of 1864[29]. The buildings are located at the southern end of the Proposed Development, approximately 1 km along the existing OHL from Dunoon Substation. The medieval origins of the small settlement are evidenced by the inclusion of this place name ('Finbacken') on Pont's map of 1583-1596 in the approximate location of the ruins, north of Dunoon[30]. Later maps from the 18th century make no record of the site suggesting the settlement was no longer in use by this period.

Post-Medieval (CE 1560 – CE 1900)

5.4.17 The beginning of the post-medieval period in Scotland is characterised by the religious and political changes brought about by the Reformation in the 16th century, the union of the crowns in 1603 under James VI, followed by religious unrest and civil war throughout the 17th century.

5.4.18 In the rural areas containing the Proposed Development, the post-medieval period is visible through the small farmsteads and agricultural structures related to them. An example of this within the Study Area is Ardnadam farm (Canmore ID 141499) (HA5), as well as the sheepfold at Rashfield (HA12), and the shieling huts up the hill from Puck's Glen (HA13 and HA15). There is also some evidence of rural industrial activity, visible in the platform and structure in Glen Finart (HA21).

5.4.19 There is one designated post-medieval heritage asset in the Study Area, the Baronial, Category B Listed Invereck House (HA8). This house was designed by James Thomson in the late 19th century and the house and surrounding buildings were redeveloped in the 20th century, and it is still in use today as a care home.

Modern

5.4.20 On the slopes of the hill leading up from Puck's Glen, a small bothy (Canmore ID 299890) (HA14) was constructed in 1990 as a refuge for hill walkers visiting the area, demonstrating the continued pull of the area for visitors. The rural areas containing the Proposed Development change from pastoral agricultural use to commercial forestry on the higher ground but retain their medieval and post-medieval land use in the glens and valleys.

5.5 Appraisal

5.5.1 The historic background has identified that there are a number of heritage assets within the Study Area. The heritage assets presented within the Study Area mostly relate to post-medieval activity ranging from farmsteads and agricultural activity, and some prehistoric field systems and activity.

5.5.2 The assessment has identified four non-designated heritage assets that are situated within the existing OHL Operational Corridor and may be directly impacted by the decommissioning of the OHL. These include:

- the remains of the potential medieval farmstead at Ardnadam (HA3);
- the remains of the shieling hut at Puck's Glen (HA13);
- the platform, structure and bloomery mounds at Clunie Burn (HA23); and

[29] 1864 Ordnance Survey *Argyllshire and Buteshire CLXXIV.13 (Dunoon)* 25 inch to the mile, 1st edition
[30] 1583-1596 Pont, T. *Mid-Argyll; from Dunoon to Inverary and loch Awe*

- the boundary wall at Clunie Wood (HA24).

5.5.3 The assessment has also identified two designated heritage assets whose settings may be impacted upon:

- Adams Cave Chambered Cairn, Ardnadam (HA4) Scheduled Monument; and
- Invereck (Church of Scotland eventide home) including outbuildings, boundary walls and gatepiers (HA8), Category B Listed Building.

5.5.4 The potential for direct physical impacts during construction, to the known and upstanding archaeological remains within the Operational Corridor (HA3, HA13, HA23 and HA24), without suitable mitigation, is high. As these four heritage assets are all within the OHL Operational Corridor, any access routes created within the Operational Corridor for the movement of plant and machinery are likely to truncate parts of the archaeological remains, if not remove them entirely. For this reason, the overall impact on these four heritage assets has been assessed as **Moderate Adverse**. The boundary wall at Clunie Wood (HA24) is of Negligible value as it is heavily truncated and disturbed, and of little historical interest, therefore the overall impact on this heritage asset has been assessed as **Slight Adverse**.

5.5.5 Both the shieling hut (HA13) and the platform, structure and bloomery mounds (HA23) are of Low value for their local historical interest and poor preservation, therefore the overall impact on these heritage assets has been assessed as **Slight Adverse**. Due to the potential medieval date of the farmstead ruins at Ardnadam (HA3), the heritage asset is of regional importance and has been assigned a medium value, therefore the overall impact on the heritage asset has been assessed as **Moderate Adverse**.

5.5.6 In terms of the impacts upon the setting of the two designated assets, these impacts would be beneficial due to the removal of electrical infrastructure. Given the High value of the Scheduled Monument of Adam's Cave Chambered Cairn (HA4), the overall impact on the setting of this asset has been assessed as **Slight Beneficial**. Invereck House (HA8) is also of High value as a Category B Listed building, but due to current screening from woodland around the house, the magnitude of impact would be No Change, resulting in a **Neutral** overall impact.

5.5.7 As the OHL is sited on variable topography, with a number of steep slopes and peaks, the potential for disturbance during decommissioning to unknown and buried archaeological remains without suitable mitigation in place is low in most areas. Where the OHL passes across the low-lying areas at Invereck and Glen Finart, this potential greatly increases, with the prehistoric and later heritage assets within the area making it likely that unknown and buried archaeological remains may be present in the vicinity.

5.6 Recommendations and Mitigation

5.6.1 Given the assessment findings, the following mitigation measures are recommended:

- Known heritage assets within the OHL Operational Corridor should be demarcated prior to the commencement of decommissioning. This should allow for ease of identification of areas of high archaeological potential and allow for the Main Contractor to avoid these areas where possible.
- Where the decommissioning works require any of the four heritage assets within the OHL Operational Corridor to be disturbed, then earthwork surveys of the affected sites should be conducted in advance of the decommissioning works commencing. A Written Scheme of Investigation (WSI) should be created, in agreement with WoSAS who advise Argyll and Bute Council on archaeological matters, providing details as to the survey methodology required.
- A watching brief is recommended on any ground disturbance for access or other ancillary works which passes through or is adjacent to any of the known heritage assets, or within any of the low-lying, high-potential areas. The methodology for the watching brief would be set out within a Written Scheme of Investigation (WSI) created in agreement with WoSAS. It would highlight the specific areas for the watching brief and would provide a methodology for excavation of any archaeological remains discovered.

Table 5-4: Schedule of Mitigation

Reference	Title	Description
CH01	Demarcation of assets within the OHL Wayleave	Known heritage assets within the OHL Operational Corridor should be demarcated prior to the commencement of decommissioning. This should allow for ease of identification of areas of high archaeological potential and allow for the Main Contractor to avoid these areas where possible. The heritage assets of Ardnadam (HA3), Puck's Glen (HA13), Clunie Burn (HA23), and Clunie Wood (HA24) will be fenced off within the OHL Operational Corridor with semi-permanent fencing for the duration of the decommissioning works in those areas.
CH02	Earthwork Surveys	Where the decommissioning works require any of the four heritage assets within the OHL Operational Corridor to be disturbed, then earthwork surveys of the affected sites should be conducted in advance of the decommissioning works commencing. A Written Scheme of Investigation (WSI) should be created, in agreement with WoSAS who advise Argyll and Bute Council on archaeological matters, providing details as to the survey methodology required.
CH03	Watching brief during construction	A watching brief is recommended on any ground disturbance for access or other ancillary works which passes through or is adjacent to any of the known heritage assets, or within any of the low-lying, high-potential areas. The heritage assets likely to require a watching brief are: • the remains of the potential medieval farmstead at Ardnadam (HA3); • the remains of the shieling hut at Puck's Glen (HA13); • the platform, structure and bloomery mounds at Clunie Burn (HA23); and • the boundary wall at Clunie Wood (HA24). The methodology for the watching brief would be set out within a Written Scheme of Investigation (WSI) created in agreement with WoSAS. It would highlight the specific areas for the watching brief and would provide a methodology for excavation of any archaeological remains discovered.

6. ECOLOGY AND NATURE CONSERVATION

6.1 Introduction

6.1.1 This appraisal identifies and evaluates the biodiversity baseline of the Site and wider Proposed Development's Ecological Zone of Influence (EZoI). The EZoI is the range over which a direct or indirect effect could occur depending on factors such as hydrological connectivity, and territorial and foraging ranges of species.

6.1.2 Additional information which supports this section is presented in the following technical appendices and figures:

- **Figure 6.1** – UKHab Habitat Results;
- **Figure 6.2** – Ancient, Native and Near-Native Woodlands;
- **Figure 6.3** – Bat Results;
- **Figure 6.4** – Squirrel Results;
- **Figure 6.5** – Pine Marten Results;
- **Figure 6.6** – Otter Results;
- **Figure 6.7** – Water Vole Results;
- **Figure 6.8** – Freshwater Pearl Mussel Results;
- **Figure 6.9** – INNS Observations;
- **Figure 6.10** – CONFIDENTIAL Badger Results;
- **Figure 6.11** – Ornithology Survey Areas;
- **Figure 6.12** – Moorland Breeding Bird Survey Results;
- **Figure 6.13** – Lekking Black Grouse Survey Results;
- **Figure 6.14** – Winter Walkover Results;
- **Figure 6.15** – CONFIDENTIAL Desk Study Results;
- **Appendix F** – Habitats Data;
- **Appendix G** – Protected Species Data;
- **Appendix H** – Confidential Badger Data; and
- **Appendix I** – Ornithology Data.

6.2 Information sources

6.2.1 Technical appendices for habitats; protected species; and confidential badger *Meles meles* data have been prepared which document the ecological baseline conditions following a desk-based review and subsequent field surveys (**Appendices F to H**).

6.2.2 An Ornithology Technical Report has also been prepared which documents the ornithological baseline through a desk study and supplementary field surveys (**Appendix I**).

Relevant Assessments

6.2.3 A Biodiversity Net Gain (BNG) Assessment is being undertaken in parallel with this EA; discussions are taking place with the landowners and a stand-alone BNG report will be available once that process and assessments have been concluded.

6.3 Confidentiality

6.3.1 **Appendix I** includes a confidential ornithology figure illustrating nest site/territory locations for species sensitive to disturbance, including species listed within Schedule 1 of the Wildlife and Countryside Act (WCA), 1981 (as amended)[31]. This figure is not for public viewing and its distribution will be limited to individuals for whom viewing is essential to assess or progress the Proposed Development.

6.4 Methodology

6.4.1 The general methodology used to identify and evaluate the baseline ecological conditions is as follows with the appraisal methodology set out further below. The methodology was formulated with cognisance of guidance from the Chartered Institute of Ecology and Environmental Management[32] (CIEEM) on Ecological Impact Assessment.

Desk Study

6.4.2 A desk-based review of publicly available data sources was conducted from July to August 2020, during the Proposed Development's routeing stage and updated during April 2023. The review was completed by competent ecologists who hold current CIEEM membership and sufficient experience in ecological data collection. Data sources included: NatureScot Sitelink[33]; Scotland's Environment Web[34]; Ordnance Survey (OS) and aerial mapping; and NBN Atlas. Please refer to **Appendix F: Habitats Data** and **Appendix G: Protected Species** Data of this EA for full details of the desk study methodologies employed.

6.4.3 To help inform the ornithological survey programme and appraisal, a consultation exercise was undertaken to request records of protected and notable species of conservation concern. The following ornithological interest groups were consulted for any relevant data they may hold:

- NatureScot;
- The Royal Society for the Protection of Birds (RSPB);
- Central Scotland Black Grouse & Capercaillie Study Group (CSBGCSG) (RSPB affiliated study group);
- Argyll Raptor Study Group (ARSG); and
- Forestry and Land Scotland (FLS).

Field Surveys

6.4.4 All field surveys were undertaken by a team of competent ecologists who hold current CIEEM membership and sufficient experience in surveying the habitats and protected species likely to be encountered across the prevailing landscape. All data were captured electronically using tablets.

Habitats Field Survey

6.4.5 Initial habitat classification and condition assessment surveys were undertaken in October 2020. This survey was later updated during September and November 2021; and July and October 2022. The following habitat surveys were undertaken concurrently:

[31] 1981 CHAPTER 69. An Act to repeal and re-enact with amendments the Protection of Birds Acts 1954 to 1967 and the Conservation of Wild Creatures and Wild Plants Act 1975; to prohibit certain methods of killing or taking wild animals; to amend the law relating to protection of certain mammals; to restrict the introduction of certain animals and plants; to amend the Endangered Species (Import and Export) Act 1976; to amend the law relating to nature conservation, the countryside and National Parks and to make provision with respect to the Countryside Commission; to amend the law relating to public rights of way; and for connected purposes.
[32] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
[33] NatureScot SiteLink Map Search [online]. Available at: https://sitelink.nature.scot/map
[34] Scotland's Environment Web [online]. Available at https://map.environment.gov.scot/sewebmap/

- UK Habitat Classification (UKHab) surveys – The UKHab surveys broadly covered all habitats occurring within a 325 m proximity of the Preliminary Alignment Options (PAO) initially defined at the Dunoon to Loch Long 132 kV OHL Rebuild Project (hereafter the 'Rebuild Project') alignment selection stage. To give a proportionate level of detail at appropriate scales of buffer within this area, a 125 m buffer of the PAO received a detailed 'Level 5' UKHab survey. The surrounding 200 m buffer of the 'Level 5' area then received a 'Level 3' UKHab survey.
- Habitat Condition Assessment (HCA) – A HCA was completed concurrently with the UKHab surveys. The results of the HCA will be used to inform the Proposed Development's BNG assessment and will be reported within a BNG report, separate from this EA.
- These habitat studies were later expanded and assessed during September and November 2021 and July and October 2022 to reflect further changes to the Rebuild Project and its applicable limits of deviation.

6.4.6 Please refer to **Appendix F: Habitats Data** of this EA for full details of the habitats field survey methodologies employed.

Protected Species Field Survey

6.4.7 A proportionate field survey approach was designed. The following Protected Species surveys were undertaken:

- Habitat Suitability Site Survey – A protected species habitat suitability survey was conducted, between 13 and 22 October 2020. The survey aimed to classify the suitability of terrestrial habitats within proximity of the Proposed Development to support the following species:
  - bat species;
  - badger;
  - bed squirrel Sciurus vulgaris;
  - pine marten *Martes martes*; and
  - reptile species.
- In addition, the survey aimed to classify the suitability of any encountered watercourses for the following riparian mammal species:
  - otter *Lutra lutra*; and
  - water vole Arvicola amphibius.
- Species-specific Site Surveys – A suite of species-specific site surveys was conducted to inform the baseline protected species aspects of this appraisal. Current field data were recorded:
  - Between September and November 2021 from the areas identified as presenting 'moderate' to 'high' suitability during the previous Habitat Suitability Site Survey; and
  - Between July and October 2022 additional, applicable species survey buffers were assessed on site, in areas where the Rebuild Project had been altered and where they were not already covered by the 2020 Habitat Suitability Site Survey.
- The following species surveys were undertaken as part of the 2021-2022 species-specific site surveys:
  - bat species;
  - badger;
  - red squirrel;
  - pine marten;
  - otter; and

  - water vole.

- Dunoon Substation Building – Additional bat surveys were completed at the substation building in November 2021 and January 2022.
- Freshwater Pearl Mussel *Margaritifera margaritifera* (FWPM) – FWPM surveys were undertaken between 22 and 24 September 2021 on the River Eachaig; the Little Eachaig River; and Glenfinart Burn.
- Invasive Non-Native floral Species (INNS) – Incidental observations of INNS were recorded concurrently with the species-specific site surveys.
- Incidental invertebrate and amphibian habitat suitability observations were also recorded concurrently with the species-specific site surveys.

6.4.8 Please refer to **Appendix G: Protected Species Data** of this EA for full details of the protected species field survey methodologies employed.

Ornithology Field Survey

6.4.9 For collection of data and assessment pertaining to the ornithological baseline, methodology based on guidance from NatureScot (formerly Scottish Natural Heritage, SNH)[35] [36] was used.

6.4.10 No novel ornithology surveys have been undertaken for the Proposed Development as the Study Area mainly overlaps with that for the Rebuild Project, except for the extreme eastern extent of the Proposed Development where proposed track upgrades are outwith all survey buffers. Therefore, baseline information to inform the Environmental Impact Assessment (EIA) for that project has also been used to inform the ornithological assessment here and is provided in **Appendix I**. The very small area of the Proposed Development not covered by the Rebuild Project survey effort is discussed further under limitations.

6.4.11 Please refer to **Appendix I: Ornithology Data** of this EA for full details of the ornithology field survey methodologies employed. A summary of the methodologies is as follows:

- Moorland breeding bird surveys used a modified version of the Brown and Shepherd methodology (Brown and Shepherd, 1993)[37] as summarised in Gilbert et al. (1998)[38]. Habitats surveyed comprised upland moorland areas and lowland agricultural areas with the survey designed to capture activity of breeding waders and waterfowl. Four survey visits were undertaken across an area encompassing the Rebuild Project footprint plus a 500 m buffer during the period late April to mid-July 2021 (inclusive).
- Scarce breeding bird surveys based on Hardey et al. (2013)[39] and Gilbert et al. (1998)[38] with surveys focused on recording scarce breeding birds, principally raptors but also potentially waterbirds and waders (e.g. those species listed on Schedule 1 of the WCA or Annex I of the EU Birds Directive). Four survey visits were undertaken across an area encompassing the Rebuild Project footprint plus a 2 km buffer during the period April to August 2021 (inclusive).
- Lekking black grouse *Lyrurus tetrix* surveys following Gilbert et al. (1998)[38]. Two survey visits were undertaken across an area encompassing the Rebuild Project footprint plus a 1.5 km buffer during April and May 2021.
- Winter walkover surveys. Three survey visits were undertaken across an area encompassing the Rebuild Project footprint plus a 500 m buffer between late November 2020 and early March 2021.

[35] SNH (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds.
[36] SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms.
[37] Brown, A.F. and Shepherd, K, B. (1993). A method for censusing upland breeding waders. Bird Study, 40: 189-195.
[38] Gilbert, G., Gibbons D.W., and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.
[39] Hardey et al. (2013). Raptors. A Field Guide for Surveys and Monitoring. SNH, Inverness.

6.4.12 As the Proposed Development comprises removal of an existing OHL, and localised works involving the reconductoring of the existing Loch Long crossing at four tower locations, no assessment of potential impacts to birds through collision risk is considered necessary. The localised footprint of the Loch Long crossing is unlikely to present a high collision risk to those species identified as Important Ecological Features (IEFs) in **Section 6.6**. These species relate to wide ranging birds of prey and black grouse as opposed to wildfowl that have a greater likelihood of making commuting flights along Loch Long. Therefore, data relating to the distribution of species sensitive to potential impacts from disturbance and/or habitat loss/degradation has been used to inform this assessment.

6.4.13 For the purposes of the ornithological appraisal, species within the below legislative/planning frameworks or conservation lists under Evaluation are referred to as Target Species.

Limitations

6.4.14 The extreme eastern extent of the Proposed Development where proposed works comprise track upgrades, is outwith all survey buffers for the Rebuild Project. Therefore, a complete set of baseline data is not available to inform assessment of this small area of the Proposed Development comprising approximately 120 m of track. For one species considered most sensitive to impacts from the Proposed Development, golden eagle, data requested during the desk study extended to 6 km, therefore incorporating this area.

6.4.15 The lack of baseline data is not considered a significant limitation given the limited extent of the Proposed Development footprint in this area. Further to this, pre-construction bird surveys as part of the Bird species Protection Plan (Bird SpPP) discussed in Section 6.7 will incorporate this area.

Evaluation

6.4.16 An evaluation of the conservation importance of protected areas, species and habitats identified within the Proposed Development's EZoI (hereafter termed 'Biodiversity Features') with reference to conservation legislation, planning policy and population trends was undertaken. The conservation status of Biodiversity Features was determined based on their presence on at least one of the following legislative/planning frameworks or conservation lists:

- protected areas designated for nature conservation at international; European; national; and local levels;
- Annex I habitats and Annex II species under the Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('Habitats Directive')[40];
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Schedule 5 of the Wildlife and Countryside Act 1981 (as amended);
- Protection of Badgers Act 1992 amended by the Wildlife and Natural Environment (Scotland) Act 2011;
- Scottish Biodiversity List (SBL); and
- Birds of Conservation Concern 5 (BoCC 5, Eaton *et al*, 2021)[41].

6.4.17 Potential impacts on Biodiversity Features were then identified. Biodiversity Features were appraised in groups due to similarity in ecology, potential impacts from the Proposed Development, and subsequent effects. The effect of the identified impacts from the Proposed Development on Biodiversity Features was considered with cognisance of embedded mitigation. Should potential adverse effects to a Biodiversity Feature be anticipated following this, it is classed as an Important Ecological Feature (IEF)

[40] The provisions of this directive have been transposed into UK and Scottish law through legislation, in particular, the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the 'Habitats Regulations').
[41] Eaton et al (2021), The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.

and assessment further in this appraisal (**Section 6.7**). Additional mitigation measures have been identified where required to avoid/reduce potentially significant effects to IEFs. Finally, a conclusion was determined based on any 'residual' effects remaining on the IEFs following the implementation of the additional mitigation measures. This conclusion is determined based on a qualitative assessment that relies on professional experience and judgement. Factors considered to inform the conclusions include the effectiveness of mitigation proposed, nature of the impacts described (e.g. duration, frequency and magnitude) and the susceptibility of the IEFs to these potential impacts. The appraisal concludes one of the following:

- no effects of the Proposed Development on the IEF(s);
- adverse residual effects of the Proposed Development on the IEF(s) that are not significant;
- adverse residual effects of the Proposed Development on the IEF(s) that are significant; or
- beneficial residual effects of the Proposed Development on the IEF(s).

6.5 Scope of Assessment

6.5.1 This appraisal assumes that embedded mitigation (design features; construction good practice; the Proposed Development's CEMP; and SSEN Transmission's GEMP and SPP documents) will be successfully delivered; this includes successful pollution prevention. Direct and indirect effects that will require additional mitigation measures in order that they be avoided/reduced have been addressed. Specifically, this appraisal covers the following potential effects during the Proposed Development's construction phase:

- loss and degradation of priority[42] and irreplaceable habitats[43] [44];
- habitat degradation and fragmentation;
- killing of, and injury to species; and
- loss of, obstruction of, or disturbance to species' resting/breeding sites and foraging areas.

6.5.2 Operational effects have been scoped out. Any future maintenance activities relating to the section of OHL Towers 12 to 15 are assumed to be confined to within the wayleave, with access via the current and proposed permanent tracks. There will be no artificial lighting added to the existing towers.

6.5.3 As discussed in Section 6.4.12 potential operational impacts to birds through collision risk have been scoped out due to the nature of the Proposed Development.

6.6 Baseline Conditions

Environmental Designations

6.6.1 Details of all statutory ecological designated sites which occur within 2 km of the Site and non-statutory designations which occur within 1 km of the Site identified during the desk study exercise are described in Table 6-1 in order of increasing distance from the Site. The locations of these sites are shown in **Figure 1.3**.

[42] Habitats considered as priorities for conservation action by aligning with descriptions of habitats under EU Annex I Habitats and/or the Scottish Biodiversity List.
[43] Areas of blanket bog or raised bog assessed as being in moderate, fairly good or good condition; and ancient woodland.
[44] Scottish Parliament (2023). National Planning Framework 4, Policies 3 and 6. Available at: https://www.gov.scot/publications/national-planning-framework-4/

Table 6-1: Designated Sites

Site Name	Reason for Designation	Distance and direction from the Site
Loch Lomond and the Trossachs National Park	Dynamic landscape of lochs and woodlands, mountains and moorlands. Known to be home to protected species such as nesting golden eagles *Aquila chrysaetos*, water voles and red squirrels.	Overlaps
Craighoyle Woodland Site of Special Scientific Interest (SSSI) (biological)	Ancient, deciduous woodland associated open ground and scattered trees; a habitat that supports a number of nationally important lower plant communities. The notified natural features are bryophyte and lichen assemblages.	0.60 km west
Upper Loch Fyne and Loch Goil Marine Protected Area (MPA)	Protected features are: burrowed mud; flame shell *Limaria hians* beds; horse mussel *Modiolus modiolus* beds; sublittoral mud and specific mixed sediment community habitats; and aggregations of ocean quahog clam *Mercenaria mercenaria*.	0.59 km north
Holy Loch Argyll and Bute Local Nature Conservation Site (LNCS)	Notable for its saltmarsh and estuarine habitat.	0.76 km east
Holy Loch Local Nature Reserve (LNR)	Area of woodland, foreshore and mudflats with a habitat mosaic shoreline (saltmarsh; mudflats; gravel beds; estuarine scrub). Notable for supporting a range of waders and overwintering bird species.	0.76 km east
Loch Eck SSSI (biological)	The notified natural features are flood-plain fen; an oligotrophic loch; the loch's fish and bryophyte assemblages; Scotland's rarest freshwater fish, the powan *Coregonus clupeoides*; and a race of nationally rare whitefish, *Coregonus laverutis*. It is also the only Scottish site where Artic charr *Salvelinus alpinus* and the powan co-exist. Apart from Loch Lomond, it is the only naturally occurring habitat of the powan fish.	1.95 km west

6.6.2 The above SSSI, MPA, LNCS and LNR sites have no hydrological connectivity or continuous connecting or overlapping forestry cover between their boundaries and the Site. There are no effect pathways to these specific sites. The Proposed Development passes through wooded and upland habitat, unsuitable habitat for the ornithological interests of the LNCS and LNR which comprise of an overwintering shorebird assemblage. These specific designated sites, therefore, do not fall within the Proposed Development's EZoI and are not considered further. The national park is considered further in **Section 6.7**.

Priority Habitats

6.6.3 Full details of the habitats mapped during the UKHab surveys are included in **Appendix F: Habitats Data**. This section presents habitats which occur within the Proposed Development's EZoI, which are IEFs by virtue of their listing on the SBL or as an Annex 1 habitat. The habitat EZoI is defined by the locations to be directly modified (permanent or temporary) by the Proposed Development, including:

- access track upgrades and new access track formation;
- use of ATV routes;
- formation of equipotential zones (EPZs); and
- associated works required to facilitate the Proposed Development including temporary site compounds and working areas (including helicopter operation compounds).

6.6.4 Habitats recorded during the UKHab surveys which fall within the EZoI and are considered to be IEFs are as follows[45] (**Figures 6.1** and **6.2** in **Appendix A**):

- f1a Blanket bog;
- h1b5 Dry heaths, upland (Annex I habitat code H4030);
- h1b6 Wet heathland with cross-leaved heath, upland (H4010);
- w1e Upland birchwoods; and
- w1f Lowland mixed deciduous woodland.

6.6.5 Areas of woodland which occur on the Ancient Woodland Inventory (AWI)[46] [47] occur within or adjacent to the Site (**Figure 6.2**). These areas shown within the AWI primarily consist of Category 1a and 2a Ancient Semi-Natural Woodland (ASNW); with lesser areas of Category 1b and 2b Long-Established woodland of Plantation Origin (LEPO); and Category 3 areas of woodland occurring on the 1750 Roy maps. However, no tree felling is anticipated for the Proposed Development and impacts to soil banks within these parcels are limited. Therefore, ancient woodlands are not considered further in this assessment.

Terrestrial Protected Species

6.6.6 **Appendix G** and **Figures 6.3** to **6.10** present the collated terrestrial protected species data. This section describes the species which have been confirmed to be present or which could occur (based on suitable habitats within the Site and confirmed presence in the wider area) within the Proposed Development's EZoI, which are Biodiversity Features by virtue of their legal protection, listing on the SBL, and/or inclusion within the Argyll and Bute Local Biodiversity Action Plan (Argyll LBAP).

Species considered further as IEFs:

- **Pine marten**; a legally protected species which is also included on the SBL. The majority of the Proposed Development falls within the known distribution range of pine marten within Scotland[48, 49]. Incidental potential evidence of pine marten activity was recorded within the Site and its outer 250 m buffer, including: multiple potential scat droppings located, within or adjacent to woodland or on access tracks; and multiple potentially suitable den sites. Pine martens are therefore considered an IEF.
- **Red squirrel**; listed as a priority species on the SBL and a legally protected species. Mature woodland with the potential to support red squirrels is present across the majority of the Proposed Development's footprint. Multiple visual observations of red squirrels were recorded during the ecological site surveys. In addition, numerous field signs of squirrel foraging and the presence of potential dreys were observed throughout the targeted squirrel habitats. Red squirrels are therefore considered an IEF.
- **Reptiles**; common lizard *Zootoca vivipara*, slow worm *Anguis fragilis* and adder *Vipera berus* are legally protected species and listed on the SBL. Mosaics of habitats with suitability to support basking and foraging reptiles have been recorded occasionally within the Proposed Development's footprint (e.g. heath, scrub, and relatively unimproved grasslands). Common lizards were also sighted during the ecology field surveys. Common species of reptile are likely to occur regularly within these suitable habitats and are therefore considered an IEF.

[45] Including UKHab habitat code for all and Annex 1 habitat code in brackets, if relevant.
[46] NatureScot (no date). A guide to understanding the Scottish Ancient Woodland Inventory (AWI) [online]. Available at: https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awi
[47] The full AWI dataset was used for this assessment. No alterations to the calculations were made based on the presence or absence of wooded areas.
[48] Croose, E., Birks, J.D.S., Schofield, H.W. and O'Reill, C. (2014). Distribution of the pine marten (*Martes martes*) in southern Scotland in 2013. Scottish Natural Heritage Commissioned Report No. 740.
[49] The Vincent Wildlife Trust (2020). The Pine Marten. Available at: https://www.vwt.org.uk/species/pine-marten/

- **Amphibians**; Great Crested Newt *Triturus cristatus* (GCN) is a European Protected Species (EPS) and is included in the Argyll and Bute LBAP as a priority species. All other amphibians native to Scotland receive limited legal protection, but only against trade. Common toad *Bufo bufo*; natterjack toad *Epidalea calamita*; and GCN are SBL species. A network of accessible ponds with the potential to support GCN was not identified. The Site occurs within a part of Scotland which is not known to support populations of GCN[50]. Therefore, GCN are not considered further in this assessment. Only limited occurrences of standing water with relatively unmanaged surrounding terrestrial habitats, and riparian habitats, occur within the Proposed Development's footprint. Common species of amphibian (other than GCN) are likely to occur regularly within these suitable habitats and are therefore considered an IEF.
- **Otter**; a legally protected species which is also present on the SBL and is an Argyll and Bute LBAP priority species. Confirmed otter resting sites were identified at watercourses which the existing OHL crosses, including: a tributary to the Glen Finart Burn, known as the Cuil Burn; and the Little Eachaig River. Otter spraints (droppings) were also identified at the River Eachaig; and the Little Eachaig River. In addition, a number of potential resting sites were also identified at the River Eachaig; and the Little Eachaig River. However, all confirmed and potential resting sites were identified outwith a 30 m buffer of the Proposed Development's footprint, including the access tracks. Due to the high potential for commuting and/or foraging otters to occur regularly in watercourses that cross the site, they are therefore considered an IEF.

Species not considered further in this assessment:

- **Badger**; listed on the SBL Social Criterion as a top 10 species valued by the Scottish public and a legally protected species. Badgers are well-adapted to the agricultural landscape which dominates large portions of the Site, exploiting habitats considered to be of negligible to low ecological importance in isolation; as well as being associated with woodland and riparian habitats. However, only limited field signs of their presence were identified during the targeted badger field survey, with any identified setts occurring outwith a 30 m proximity of the Site, including the access tracks and they are not considered further in this assessment.
- **Bats**; all species found in Scotland are legally protected, and most are included on the SBL. Potential roost features for bats were identified within trees, rock faces and a bridge during the targeted bat surveys. However, a vast majority of these occur outwith a 30 m buffer of the Proposed Development's footprint, including the access tracks, within only four trees with moderate summer roost suitability occurring within this proximity of ATV routes. Therefore, there is negligible risk of potential disturbance to roosting bats (if any) and they are not considered further in this assessment. Whilst bats are not considered and IEF, relevant compliance with the provisions of the Habitats Regulations[51] should still be undertaken, including protected species licencing if required, as per SSEN Transmission's SPP documents.
- **Water vole**; a species with partial legal protection, is on the SBL and is an Argyll and Bute LBAP priority species. No field evidence of water vole presence or activity was identified during the targeted watercourse surveys and their riparian habitats. Consequently, this species is not considered to occur within an EZoI and is not considered further in this assessment.
- **Fish**[52]; No direct impacts to watercourses are anticipated as a result of the Proposed Development. Embedded mitigation to help avoid potential adverse effects on rivers and streams during the Proposed Development's construction are included within SSEN Transmission's GEMP documents. Therefore, fish are not considered further in this assessment.

[50] O'Brien, D., Hall, J., Miró, A., & Wilkinson, J. (2017). Testing the validity of a commonly-used habitat suitability index at the edge of a species' range: great crested newt Triturus cristatus in Scotland, Amphibia-Reptilia, 38(3), 265-273. Available at: https://doi.org/10.1163/15685381-00003108

[51] Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (Habitats Regulations).

[52] Atlantic salmon, brown and sea trout, lamprey, European eel.

- **Freshwater pearl mussel**; a legally protected species which is also present on the SBL and is an Argyll and Bute LBAP priority species. No field evidence of FWPM was identified during the targeted watercourse surveys. FWPM populations are not thought to occur within the targeted sections of watercourse which the existing OHL cross. Consequently, this species is not considered to occur within an EZoI and not considered further in this assessment.

Ornithology

6.6.7 The Ornithology Data (**Appendix I**) and **Appendix A** Figures **6.11 to 6.14** and **Confidential Figure 6.15** represent a full review of all species data available. A summary of the results is provided below.

Data Requests

6.6.8 Records of Target Species provided by the consultees are described below and shown in **6.15**.

6.6.9 NatureScot provided reports for two separate golden eagle ranges that overlap with the Proposed Development (Austin et al. 2015[53, 54]). The Proposed Development crosses the very edge of territories G/ A22 and G/ C1. Territory extents and use were predicted using the Predicted Aquila Territories (PAT) model.

6.6.10 NatureScot also provided results from a recent Golden Eagle Topography model (GET) run across the entire Scottish land mass (including islands). The GET model predicts the air space use of golden eagles based on topography alone[55]. The model is based on GPS telemetry readings gained from tagged juvenile eagles in Scotland. The GET model is considered superior to the PAT model at predicting space use, for both dispersing juveniles and territorial adults[56]. The GET model predicts space use based on a standardised preference index (SPI) score ranging from the lowest predicted use, SPI 1, to the highest predicted use SPI 10. SPI scores of less than 6 would mean that the corresponding area is likely to be rarely used by eagles. The GET model predicted a high level of use (SPI scores of 8, 9 and 10) across much of the open upland habitats within the identified territories and along and adjacent to the Proposed Development. The GET model exhibiting SPI score of six and above is shown on **Confidential Figure 6.15.**

6.6.11 The RSPB provided five records of black grouse (all males) from three locations over 1 km from the Site.

6.6.12 The CSBGCSG provided eleven records of black grouse from five locations comprising 10 records of males and one of a female. Four of the locations are within 1 km of the Proposed Development.

6.6.13 The Argyll Raptor Study Group provided the following records:

- Golden eagle *Aquila chrysaetos* – four nest sites from three breeding sites were provided. The closest nest site to the Proposed Development was located approximately 1.2 km away and was occupied in 2022. All three breeding sites were located within 6 km of the Site.
- Hen harrier *Circus cyaneus* – four breeding sites monitored since 2015 were provided. Of these sites only two were recorded as confirmed breeding since 2015 (most recently in 2020). Both sites were over 1 km from the Proposed Development.
- Peregrine falcon *Falco peregrinus* – a record of one nest site monitored in 2021 was provided. The breeding site was approximately 1.1 km from the Proposed Development and was occupied in 2021.

[53] Austin, S., Fielding, A. H. and Haworth, P. F (2015a). G/C1 Golden eagle range report – Natural Heritage Zone 14 "Argyll West and Islands". Scottish Natural Heritage Commissioned Report No. 827.
[54] Austin, S., Fielding, A. H. and Haworth, P. F (2015b). G/A22 Golden eagle range report – Natural Heritage Zone 14 "Argyll West and Islands". Scottish Natural Heritage Commissioned Report No. 859.
[55] Fielding, A, H., Haworth, P, F., Anderson, D., Benn, S., Dennis, R., Weston, E and Whitfield, A, P (2019). A simple topographical model to predict Golden Eagle Aquila chrysaetos space use during dispersal. IBIS, 162(2), 400-415
[56] NatureScot (2021). NatureScot statement on modelling to support the assessment of forestry and wind farm impacts on golden eagles. Available online: https://www.nature.scot/doc/naturescot-statement-modelling-support-assessment-forestry-and-wind-farm-impacts-golden-eagles. (Accessed June 2022).

- Barn owl *Tyto alba* – records from seven nest sites. Three records were located within 500 m of the Site. In 2022 three of these sites were confirmed as occupied by pairs with two pairs successful in raising young.

Scarce Breeding Bird Survey

6.6.14 No breeding territories of scarce breeding birds were recorded. Observations of scarce breeding birds, including those recorded during the moorland breeding bird survey, are summarised below:

- Golden eagle – a single adult in flight approximately 1.5 km west of the Proposed Development;
- Hen harrier – two records of individual hunting males near the Proposed Development in the northern and central sections; and
- Osprey *Pandion haliaetus* – flight by an individual bird over woodland at the southern end of the Proposed Development.

Black Grouse Lekking Surveys

6.6.15 The survey identified two black grouse leks, both occupied by single male birds, in the central section of the survey area. One lek was located directly adjacent to the Proposed Development and the other approximately 1.2 km from the Proposed Development.

6.6.16 Additionally, records of black grouse, including lekking birds, were recorded during the flight activity, moorland breeding bird and winter walkover surveys. Records included a peak count of seven birds recorded in the northern section of the survey area.

Moorland Breeding Bird Survey

6.6.17 The only breeding territories recorded during the moorland breeding bird survey were two common sandpiper *Actitis hypoleucos* territories along the River Eachaig. The territory centre points were located approximately 500 m north and 600 m south of the closest point of the Site respectively (Dunoon to Loch Long 132 kV rebuild tracks).

6.6.18 No territories were recorded in the open upland areas of the survey area.

Winter Walkover Survey

6.6.19 Eight target species were recorded during the winter walkover surveys including two records of golden eagle Many of the records were located along coastal areas on the periphery of the survey area including records of curlew *Numenius arquata*, oystercatcher *Haematopus ostralegus*, and redshank*Tringa totanus*.

IEFs

6.6.20 Based on the data gathered above, the following IEFs are taken forward for appraisal:

- Golden eagle. A golden eagle nest site was identified within approximately 1.2 km of the Proposed Development and that the Proposed Development crosses the edge of two golden eagle territories. This species is sensitive to disturbance and a species of elevated conservation importance (Schedule 1, SBL).
- Black grouse. The black grouse survey identified two black grouse leks, both occupied by single male birds, in the central section of the survey area. One lek was located directly adjacent to the Proposed Development and the other approximately 1.2 km from the Proposed Development. Additionally, records of black grouse, including lekking birds, were recorded during the flight activity, moorland breeding bird and winter walkover surveys. Records included a peak count of seven birds recorded in the northern section of the survey area. This species is sensitive to disturbance and a species of elevated conservation importance (BoCC red list, SBL).

6.6.21 Records of other Target Species (osprey, hen harrier and moorland waders) indicate low use of the Proposed Development footprint and immediate surrounding area; therefore, these species are not taken forward for appraisal.

6.7 Appraisal

Designated Sites

6.7.1 The Loch Lomond and the Trossachs National Park (hereafter the 'National Park') overlaps a majority of the Site on the west side of Loch Long (**Figure 1.3**). The National Park is known to support a range of terrestrial protected species such as water voles and red squirrels. Due to the limited degree of habitat impacts required by the Proposed Development, it is considered unlikely that the construction or operation of the Proposed Development would adversely impact the National Park's natural environment policies[57]. Specific species applicable to the National Park that are considered IEFs are covered in further detail in the Terrestrial **Protected Species** appraisal section, below.

Priority Habitats

6.7.2 Temporary impacts, resulting from the use of the ATV routes and formation of EPZs, and permanent impacts, resulting from the formation and upgrade of access tracks on the east side of Loch Long have been considered to all habitat IEFs (**Section 6.6**).

6.7.3 The total, combined area of priority habitats to be potentially impacted totals 2.60 hectares (ha)[58] (**Table 6-2**). Of these, 1.06 ha would be subject to temporary impacts only. The total extent of priority habitat to be permanently lost (1.54 ha) would be relatively minor compared to its wider coverage across the wider landscape.

Table 6-2: Areas of priority habitat impact[58]

Priority Habitat	Area of temporary impact (ha)	Area of permanent impact (ha)	Combined area of impact (temporary and permanent) (ha)
f1a Blanket bog	0.15	-	0.15
h1b5 Dry heaths, upland (H4030)	0.02	-	0.02
h1b6 Wet heathland with cross-leaved heath, upland (H4010)	0.83	1.54	2.37
w1e Upland birchwoods	0.04	-	0.04
w1f Lowland mixed deciduous woodland	0.02	-	0.02
Total	**1.06**	**1.54**	**2.60**

6.7.4 Due to the limited scale and timescale over which the Proposed Development's construction activity impacts (**Section 2**) would occur; adherence to SSEN Transmission's GEMPs; and a lack of anticipated tree removal; it is considered likely that these priority habitats will recover from any temporary impacts resulting from the use of the ATV routes and formation of EPZs within a period of no longer than two years.

6.7.5 A relatively small area (1.5 ha) of h1b6 'wet heathland with cross-leaved heath, upland' will be subject to permanent impacts of habitat loss during the construction phase. This is anticipated to cause adverse residual effects that are not significant. The embedded mitigation measures, with particular reference to SSEN Transmission's Generic Environmental Management Plan (GEMP) for Soil Management and

[57] Loch Lomond and The Trossachs National Park Authority (2017). Local Development Plan. https://www.lochlomond-trossachs.org/planning/planning-guidance/local-development-plan/
[58] Rounded to two decimal places.

Restoration, will reduce degradation effects beyond the boundary of the footprint of permanent infrastructure.

6.7.6 It is anticipated that good biosecurity practices will be implemented through the CEMP to avoid spread of any INNS within the working areas associated with the Proposed Development.

Terrestrial Protected Species

6.7.7 During the Proposed Development's construction, there is potential for the killing of, and injury to protected species; and the loss of, obstruction of, or disturbance of protected species' resting sites. However, no significant effects are anticipated.

6.7.8 Permanent and temporary loss of foraging habitat for pine marten; red squirrel; reptiles; and amphibians will be marginal, relative to the wide spanning landscape of heathland, mires, woodlands and grassland.

6.7.9 Implementation of SSEN Transmission's SPPs and GEMPs, provided in **Appendix C: GEMPs and SPPs**, will be sufficient to mitigate potential impacts of injury/mortality and disturbance/displacement of the following species:

- badger;
- pine marten;
- red squirrel;
- otter;
- bat species; and
- bird species.

6.7.10 In the absence of a reptile or amphibian SPP, specific additional measures are included in **Section 6.8** for implementation during the construction phase of the Proposed Development.

Ornithology

Golden Eagle

Habitat Loss and Degradation

6.7.11 Permanent habitat loss will be restricted to a very small area on the east side of Loch Long for the upgrade of access tracks associated with reconductoring of the Loch Long Crossing, equating to approximately 120 m of track, approximately 20 m wide. This habitat loss will be negligible in comparison to the extensive foraging habitat available to golden eagle in the wider area as shown on **Confidential Figure 6.15.**

6.7.12 Outwith the permanent access tracks, temporary features comprising proposed ATV routes will not permanently modify the habitats present and helicopter compounds will be in agricultural areas of low value to foraging golden eagle as shown on **Confidential Figure 6.15.** Furthermore, helicopter compound locations will be restored to their original condition upon completion of the related construction works. All these temporary areas of habitat loss/modification occupy a very small footprint in comparison to the extensive foraging habitat available to golden eagle in the wider area as shown on **Confidential Figure 6.15.**

6.7.13 **No Effects** of the Proposed Development on the IEF are predicted.

Disturbance and Displacement

6.7.14 Noise and visual stimuli emitted during construction works could disturb birds during activities vital to survival and reproduction and, as a worst-case, could cause the abandonment of active nests and death of eggs or chicks.

6.7.15 The nearest golden eagle nest to the Proposed Development, approximately 1.2 km away, is predicted to be out with a ZoI for disturbance from conventional works to facilitate the Proposed Development based on guidance[59], and out with the ZoI predicted for the use of helicopters[60].

6.7.16 Displacement of golden eagle from foraging areas may occur during the construction works. It is not predicted that this temporary displacement of golden eagles would result in effects on breeding productivity of territorial pairs or the survival of adults or fledged young. The most disturbing activities, helicopter flights, will be of short duration and frequency and localised to flight routes over sites under construction at that time in the works programme.

6.7.17 Overall, the adverse effect of disturbance and displacement on golden eagles would be short term and small in spatial scale based on the size of golden eagle territories and is only predicted to impact hunting or displaying birds (i.e., wont directly affect nest sites). This effect is unlikely to affect the conservation status of golden eagle, which is currently exhibiting increasing population trends nationally. Therefore, the effect of disturbance and displacement on golden eagle would not be significant.

6.7.18 Adverse residual effects of the Proposed Development on the IEF are **Not Significant.**

Black Grouse

Habitat Loss and Degradation

6.7.19 Two black grouse leks, each comprising a single male, were recorded in the central section of the OHL alignment. Low number of black grouse, albeit representing approximately 3% of the regional population of 67 displaying males, utilise habitat along the central area of the OHL alignment. Habitat loss, however, will largely be restricted to temporary degradation of upland habitat. The habitat requirements and diet of black grouse vary seasonally with heather and other dwarf shrubs providing important food plants and nesting habitat and grassland providing lekking and brood rearing sites[61]. The presence of lekking birds indicates that nesting females may be present within suitable heathland habitat in the surrounding area (likely a low number, based on the number of lekking males).

6.7.20 Permanent habitat loss will be restricted to a very small area on the east side of Loch Long for the upgrade of access tracks and creation of new retained access track associated with reconductoring of the Loch Long Crossing, equating to approximately 130 m of track, approximately 20 m wide. This habitat loss will be negligible in comparison to the extensive habitat available to black grouse in the wider area. Outwith the permanent access tracks, temporary features comprising proposed ATV routes will not permanently modify the habitats present and helicopter compounds will be in agricultural areas of low value to black grouse.

6.7.21 Loss of suitable habitat would either be of too small a scale (permanent loss) or temporary in nature to result in effects on black grouse breeding productivity or survival because of loss of foraging or breeding

[59] Goodship, N.M. and Furness, R.W. (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.
[60] SNH (2015). The use of helicopters and aircraft in relation to disturbance risks to Schedule 1 and 1A raptors and wider Schedule 1 species.
[61] Pearce-Higgins, J, W., Wright, L, J., Grant, M, C and Douglas, D, J, T (2016). The role of habitat change in driving Black Grouse *Tetrao tetrix* population declines across Scotland. Bird Study (2016) 63, 66–72

habitat. Affected habitat represents a small proportion of larger expanses of largely ubiquitous habitat present in the area surrounding the Proposed Development footprint.

6.7.22 Adverse residual effects of the Proposed Development on the IEF are **Not Significant**.

Disturbance and Displacement

6.7.23 Evidence provided in guidance[59] suggests that a maximum ZoI for conventional construction operations potentially disturbing black grouse would be 750 m from the source. Black grouse are not mentioned in SNH guidance in relation to potential impacts from helicopter flights. As a reasonable worst-case scenario, a maximum ZoI of 1000 m (lateral) and 500 m (altitudinal) is deemed appropriate. It is assumed that the ZoI would be greatest for lekking males.

6.7.24 Two black grouse lek sites, each comprising a single male, were recorded during the surveys, one of which was directly adjacent to the OHL alignment. Multiple other records of black grouse, including two leks of three birds each, were recorded during other surveys, at the northern end of the Survey Area. One of these leks was directly beneath helicopter flight paths and the other was approximately 700 m away. Based on this information it is assumed, as a reasonable worst-case scenario, that:

- one lek of a single male in the central section of the OHL alignment would be disturbed and displaced during removal of the existing OHL; and
- two leks comprising three males each would be disturbed and displaced from the northern section of the OHL alignment during helicopter flights only. It is expected that the plantation woodland and steep slope in this area would screen other construction works from black grouse habitat to the north-west.

6.7.25 Disturbance and displacement of black grouse leks could affect breeding productivity as black grouse leks are typically located within suitable breeding habitat. Therefore, disturbance could disrupt breeding behaviour or displace black grouse, including females, from optimal nesting and chick rearing habitat. An impact on seven lekking males would represent approximately 10% of the regional population. This effect could also contribute to the local extinction risk of a small and potentially isolated population.

6.7.26 Overall, the adverse effect of disturbance and displacement on black grouse affect a relatively large proportion of the regional population of a species with a poor conservation status (declining nationally). Therefore, the effect of disturbance and displacement on black grouse would be Significant.

6.7.27 Ornithology mitigation is described for black grouse in **Table 6-3**. Mitigation relates to the northern section (Towers 1 to 20) and the central section (Towers 28 to 47). To confirm, as well as specific mitigation described below, pre-construction surveys will be undertaken and a mitigation hierarchy adopted for all breeding birds, including those scoped out of this assessment, as detailed in the Bird SpPP.

6.7.28 The mitigation detailed in **Table 6-3** will ensure no significant residual adverse effects to black grouse. The mitigation in **Table 6-3** considers the lekking period (March to May). Some disturbance of nesting female black grouse and their dependent young cannot be fully ruled out and the period of sensitivity could extend outwith the lekking period to July. Unlike lekking male birds, significant disturbance is only likely to occur with females at a very localised scale if birds were nesting or attending dependent young within the footprint of the Proposed Development or alongside. Further to this, the mitigation hierarchy adopted for all breeding birds as detailed in the Bird SpPP would also reduce potential effects e.g., through bird nest checks.

6.7.29 Adverse residual effects of the Proposed Development on the IEF are **Not Significant.**

6.8 Recommendations and Mitigation

6.8.1 The specific mitigation presented in **Table 6-3**, in addition to the above general best practice measures, will be adopted to ensure compliance with nature conservation legislation.

Table 6-3: Additional mitigation measures

Reference	Title	Description
BD1	Reptiles and amphibians	If a reptile/amphibian is sighted or suspected, the nearby vegetation should be gently disturbed by hand to encourage the reptile/amphibian to move off of its own accord. Reptiles/amphibians incidentally encountered on site should not be handled unless under instruction by the ECoW and by gloved hand, and to transport the reptile/amphibian to a place of safety (e.g., further away from construction works). The appointed ECoW and contractors should also refer to the following standard industry guidance for supplementary advice: • Amphibians and Reptiles Group UK Advice Note 10: Reptile Survey and Mitigation Guidance for Peatland Habitats (https://www.arguk.org/info-advice/advice-notes) • NatureScot Standing Advice for Reptiles (www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species)
BD2	Pre-construction Survey	In accordance with the Bird SpPP, pre-construction black grouse lek surveys will be undertaken within 1.5 km of the Site (including helicopter routes) across the northern and central sections of the OHL alignment. Surveys should encompass the dawn period, one hour before sunrise to two hours after and could be undertaken by the ECoW if suitably qualified. If works are scheduled to commence within the March to May period pre-construction surveys must be undertaken the previous year.
BD3	Construction Mitigation	No helicopter flight routes will be permitted within 1000 m of any identified lek sites during the period March to May inclusive during the peak lekking periods (one hour prior to sunrise until two hours after sunrise and two hours before sunset to one hour after). The above default stand-off distance will be implemented until and unless pre-construction surveys identify that lekking ends earlier or later than 2 hours after sunrise. A flight plan will be developed to show identified lek sites and exclusion zones.
BD4	Construction Mitigation	For all other works a default stand-off distance of 750 m from identified lek sites will be applied. As above the timings of the stand-off period will be determined by lekking activity recorded during the pre-construction surveys. The default stand-off will apply from March to May inclusive during the peak lekking periods (one hour prior to sunrise until two hours after sunrise and two hours before sunset to one hour after). The stand-off distance of 750 m is a precautionary distance that may be revised following an evaluation by the ECoW of factors including the nature of works proposed in the area and the line of sight between the works and the lek (e.g., hills or woodland could screen the works).

6.8.2 Following the successful implementation of the embedded and additional mitigation measures, there are **no anticipated significant residual effects of** the Proposed Development's construction or operation on the identified IEFs.

7. HYDROLOGY, HYDROGEOLOGY AND SOILS

7.1 Introduction

7.1.1 This section assesses the likelihood of environmental effects to hydrology, hydrogeology and soils resulting from the Proposed Development. Detailed information regarding the Proposed Development is provided in **Section 2: Proposed Development**.

7.1.2 This section focuses on the effects of the construction phase of the Proposed Development upon hydrological, hydrogeological, and soil features and takes a precautionary approach in terms of recommendations and mitigation strategies. There are no operational effects to hydrology, hydrogeology and soils receptors anticipated, due to the design and extent of the Proposed Development. Therefore, these long-term effects have been scoped out from the assessment.

7.1.3 During the construction phase of the Proposed Development, there is the potential for the following short-term impacts on the hydrology, hydrogeology, and soil receptors:

- modification of hydrological pathways;
- modification of groundwater flows and levels;
- flood risk;
- pollution incidents;
- soil erosion and sedimentation;
- loss and compaction of peat and soils; and
- peat instability.

7.1.4 For the purpose of this assessment, the Proposed Development comprises only the upgrades to Towers 12 and 13 and the associated access tracks, east of Loch Long. The proposed works for the reconductoring and removal of existing overhead line do not involve any new excavations (although there will be local excavations to bury the tower stubs within the existing tower footprint). and have therefore been scoped out of the assessment on the basis that good practice measures (detailed in GEMPs and a Construction Environmental Management Plan (CEMP)) are implemented on-site. The conditions to prevent pollution and manage drainage will be addressed within the CEMP.

7.1.5 the SSEN Transmission GEMPS will be adhered to.

7.1.6 This assessment is based upon the land within the site of the Proposed Development, with application of professional judgement and experience of assessing similar developments in similar environments. The following terms are used across this Report.

- Site – the location of the Proposed Development, which extends to Towers 12 and 13 and the associated tracks; and
- Study Area – refers to various buffers for the consideration of different receptors, that extend beyond the Proposed Development and Site.

7.2 Information Sources

7.2.1 The following sources of information have been reviewed:

- Ordnance Survey (OS) Map data at 1:10,000, 1:25,000 and 1:50,000 scales;
- Scottish Environment Protection Agency (SEPA) River Basin Management Plan classification data (Water Classification Hub)[62];

[62] SEPA (2021) Water Classification Hub [online]. Available at: https://informatics.sepa.org.uk/RBMP3/ [Accessed: April 2023]

- NatureScot Sitelink[63];
- Consultation with SEPA, Scottish Water, and Argyll and Bute Council to identify water abstractions and private water supplies (PWS);
- James Hutton Institute National Soils Map of Scotland[64];
- British Geological Survey (BGS) GeoIndex maps for superficial and bedrock geology[65];
- NatureScot Carbon and Peatland Map[66]; and
- SEPA Flood Maps[67].

7.3 Methodology

7.3.1 The general methodology used to assess the effect of the Proposed Development on the hydrology, hydrogeology and soils of the Study Area is as follows:

- desktop study to obtain baseline and historical data;
- consultation with Argyll and Bute Council and Scottish Water (SW) to identify private and public water supplies, respectively;
- consultation with SEPA to obtain any Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR)[68] Licensed abstractions data;
- UKHab surveys to obtain habitat data in October 2020, to determine the presence of any potential Groundwater Dependent Terrestrial Ecosystems (GWDTE);
- identification of the potential effects of the Proposed Development; and
- identification of options for the mitigation of potential effects, taking account of SSEN's Transmission General Environmental Management Plans (GEMPs).

7.3.2 **Table 7-1** provides a summary of the consultation activities undertaken in support of the preparation of this section.

[63] NatureScot (2023) SiteLink Map [online]. Available at: https://sitelink.nature.scot/map [Accessed: April 2023]
[64] The James Hutton Institute (2021) Soil Survey of Scotland Staff (1970-1987). Soil maps of Scotland (partial coverage) at a scale of 1:25 000. Digital phase 8 release. James Hutton Institute, Aberdeen. DOI 10.5281/zenodo.5159133. Available at: https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download#soilmapdata
[65] BGS (2020) GeoIndex Onshore [online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.108402308.747036501.1649335188-910263277.1649335188 [Accessed: April 2023]
[66] NatureScot (2016) Carbon and Peatland 2016 map [online]. Available at: https://cagmap.snh.gov.uk/natural-spaces/dataset.jsp?code=PEAT
[67] SEPA (2023) Flood Maps [online]. Available at: https://scottishepa.maps.arcgis.com/apps/webappviewer/index.html?id=b3cfd390efa44e3b8a72a07cf5767663&showLayers=FloodMapsBasic_5265;FloodMapsBasic_5265_0;FloodMapsBasic_5265_1;FloodMapsBasic_5265_2;FloodMapsBasic_5265_3;FloodMapsBasic_5265_4;FloodMapsBasic_5265_5;FloodMapsBasic_5265_6;FloodMapsBasic_5265_7;FloodMapsBasic_5265_8;FloodMapsBasic_5265_9;FloodMapsBasic_5265_10;FloodMapsBasic_5265_11 [Accessed: April 2023]
[68] Scottish Government (2011). Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

Table 7-1. Consultation responses of relevance to Hydrology, Hydrogeology and Soils

Organisation	Type of consultation	Response	How response has been considered
Argyll and Bute Council	Data request via email in March 2023, for details of any Argyll and Bute Council registered private water supplies within a 5 km buffer and if so the details of the coordinates of the supply/property, the,address, and the type of supply.	Response received in March 2023. Argyll and Bute Council provided PWS information within a 5 km area surrounding the Proposed Development centre point.	PWS data reviewed. There are no PWS within 1 km of the Proposed Development.
Scottish Water	Data request via email in March 2023, for details of whether there are Scottish Water registered assets within 5km of the Proposed Development and if so, an indication of their location.	Data provided in February 2023. Scottish Water recommended to use the dataset gathered under agreement via Scottish Water abstractions database.	There are no Scottish Water abstractions within 1 km of the Site.
SEPA	Data request via email in March 2023, for details of any SEPA registered supplies and abstractions located within a 5 km buffer and if so, the details of the coordinates of the supply/property, the address, and the type of supply.	Response received in March 2023. SEPA indicates that there is one CAR licence within 5 km of the Proposed Development, located approximately 2.4 km south of the Proposed Development.	Response noted. There are no registered abstractions within 1 km of the Site.

7.4 Baseline Environment

Study Areas

7.4.1 The Study Area for hydrology, geology and soils receptors is based on a 1 km buffer of the Proposed Development. It is considered that at distances greater than 1 km, the Proposed Development is unlikely to have a hydrological impact, as attenuation and dilution of substances is likely to occur.

7.4.2 SEPA's guidance on assessing the impacts of developments on GWDTE (LUPS-GU31)[69] requires assessment of potential GWDTE located within 250 m of excavations greater than 1 m and within 100 m of excavations less than 1 m. Therefore, UKHab surveys were undertaken within 250 m of the Proposed Development in October 2020, with additional habitat surveys undertaken in September and November 2021 to reflect further changes to the Rebuild Project and its applicable limits of deviation, which is defined as the GWDTE Study Area.

Surface Water Hydrology

7.4.3 The Water Framework Directive (WFD) came into force in December 2003 and is implemented in Scotland through the Water Environment and Water Services (Scotland) Act 2003[70]. A key objective of this Directive is the achievement of 'good condition' (as a minimum) of all natural water bodies by 2027.

7.4.4 Under the terms of the WFD, all river basin districts require to be characterised. The characterisation process required SEPA to produce an initial assessment of the impact of all significant pressures acting on the water environment.

7.4.5 The Site is drained by a number of unnamed watercourses, which flow north to south before discharging to Gare Loch. Gare Loch SEPA water body (ID: 200043) was classified by SEPA under the Water Framework Directive (WFD) as having an overall status of 'Good' in 2020.

7.4.6 The western extent of the Site is drained by an unnamed watercourse, flowing south-east to north-west before discharging to Loch Long (South). Loch Long (South) water body (ID: 200045) was classified by SEPA under the WFD as having an overall status of 'Good' in 2020.

7.4.7 A review of OS 1:10,000 scale mapping shows a large number of watercourses within the Study Area, with the proposed access tracks crossing two watercourses.

Designated Sites

7.4.8 According to NatureScot Sitelink[63] there are no designated sites in relation to hydrology, geology or soils which are of regional, national, or international importance within the Study Area.

Geology and Soils

Bedrock geology

7.4.9 According to BGS GeoIndex Mapping[65] the bedrock geology underlying the Study Area from north to south is Beinn Bheula Schist Formation (Psammite and Pelite), North Britain Siluro-Devonian Calc-Alkaline Dyke Suite and Bheula Schist Formation (Pelite, Semipelite and Psammite).

[69] SEPA (2017) Land Use Planning System SEPA Guidance Note 31 [online] Available at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf

[70] UK Government (2003) Water Environment and Water Services (Scotland) Act 2003 [online] Available at: https://www.legislation.gov.uk/asp/2003/3/contents

Superficial geology

7.4.10 According to BGS GeoIndex Mapping[65], superficial deposits are predominantly absent within the Study Area, with pockets of Devensian till (diamicton) and peat deposits noted at the eastern extent of the Study Area.

Soils

7.4.11 According to the James Hutton Institute National Soils Map of Scotland[71], the Study Area is predominantly underlain by peaty gleys, followed by brown earths with humus-iron podzols and a small pocket of noncalcareous gleys with humic gleys.

Peat

7.4.12 According to the NatureScot Carbon and Peatland Map[66] Class 1 '*Areas likely to be of high conservation value*' priority peatland is not present within the Study Area. A pocket of Class 2 '*Areas of potentially high conservation value and restoration potential'* is crossed by the Proposed Development, between towers 12 and 13. The Study Area is mainly underlain by Class 0, Class 3, Class -2 and Class 5, which are not indicative of priority peatland habitat.

7.4.13 An Unexploded Ordnance (UXO) assessment was commissioned to Zetica in April 2022. The report identified the Study Area as Moderate risk. As a result, peat probing was limited to 1.00 m depth as a precautionary methodology, as advised by a Zetica UXO Engineer escorting the WSP peat survey team.

7.4.14 Peat probing was carried out in November 2022, which indicated a range of peat depths between 0.10 and >1.00 m within the Site, shown on **Figure 7.1: Hydrology and Peat**. Of the 18 records, seven depths were beyond 1.00 m, which were not possible to probe to full depth due to the Moderate UXO Risk.

Groundwater

7.4.15 SEPA's Water Classification Hub (2020)[62] classifies groundwater under two conditions: 'Good' or 'Poor'. The classifications take into account pressures and their potential effects, compared to near natural conditions for the respective water body. These classifications are based on the level of chemicals in the water, the volume of water and any groundwater interaction with surface waters[72].

7.4.16 The Study Area is underlain by the Cowal and Lomond groundwater body (ID: 150689), which has an overall WFD status of 'Good' in 2020[62]. According to the Scottish Government's Drinking Water Protected Area (DWPA) Maps[62], the Study Area is not located within a DWPA for Surface Water but the Cowal and Lomond groundwater body is part of a DWPA for groundwater[73].

7.4.17 A review of the BGS Hydrogeology Map at a 1:625,000 scale (2020)[74] indicates that the Study Area is underlain by the Southern Highland Group low productivity aquifer, where small amounts of groundwater might be encountered in the near surface weathered zone and secondary fractures.

Water Supplies

7.4.18 Data supplied through consultation with Argyll and Bute Council, SEPA and Scottish Water indicates that there are no water supplies within the Study Area.

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[71] The James Hutton Institute (2021) Soil Survey of Scotland Staff (1970-1987). Soil maps of Scotland (partial coverage) at a scale of 1:25 000. Digital phase 8 release. James Hutton Institute, Aberdeen. DOI 10.5281/zenodo.5159133. Available at: https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland/download#soilmapdata

[72] SEPA (2020) Classification of the water environment explained [online]. Available at: https://www.sepa.org.uk/media/333515/classification-overview.pdf

[73] Scottish Government (2013) DWPA - Scotland RBD - surface water - map 9 of 22. Available at: https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/

[74] BGS (2020) GeoIndex Onshore – Hydrogeology Map [online]. Available at: http://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

7.4.19 Based on SEPA LUPS-GU31[69], a number of habitats are recorded within the Study Area, which are indicative of potentially moderate and high groundwater dependency.

7.4.20 The GWDTE Study Area is dominated by H1b6 - Wet heathland with cross-leaved heath, with two small pockets of G1b - Upland acid grassland communities and H1a5 - Dry heath (shown on **Figures 6.1** and **6.2** in **Appendix A**), approximately 120 m north and 40 m east of the Proposed Development, respectively.

7.4.21 H1b6 - Wet Heathland, which is equivalent to National Vegetation Classification (NVC) M15 *Scirpus cespitosus-Erica tetralix* wet heath, has a potential Moderate groundwater dependency based on SEPA's Guidance[69]. Wet heath is widespread in the north and west of Great Britain. It is most common in the western Highlands. It is a community of shallow, wet, or intermittently waterlogged, acid peat or peaty mineral soils on hillsides, over moraines, and within tracts of blanket mire[75].

7.4.22 This community is present on shallow peat on the local western slopes of the Site. The flora is likely to have been altered by grazing and burning, which are apparent on aerial imagery. These practices have probably influenced the widespread extent of the H1b6 – Wet Heathland species within the Site.

7.4.23 These communities are likely to be associated with surface water moving downslope toward Loch Long (west of the Proposed Development) and Gare Loch (east of the Proposed Development). They are associated with a dendritic structure of smaller watercourses (mostly unnamed) on gentle slopes. As detailed in the Groundwater Section, the underlying rock unit is the Southern Highland Group, which is a low productivity aquifer with small amounts of groundwater in the near surface weathered zone and secondary fractures[74].

7.4.24 As a result, these communities are unlikely to be critically dependent on groundwater and GWDTE has therefore been scoped out of further appraisal.

Flooding

7.4.25 According to SEPA Flood Maps[67], the Site is not located in an area at high or medium risk of surface water, river or coastal flooding.

7.4.26 The McAuley Burn is located approximately 780 m east of the Site and is identified as being at high risk of localised river flooding immediately adjacent to its banks[67].

7.4.27 There are multiple small pockets of high surface water flood risk within the Study Area; however, the closest proximity to the Site is approximately 200 m.

7.4.28 Loch Long is located approximately 220 m west of the Site and is identified as being at high risk of coastal flooding.

7.5 Appraisal

Effects Scoped Out

7.5.1 Effects relating to PWS have been scoped out on the basis that there are none within the Study Area.

7.5.2 Effects relating to GWDTE have been scoped out on the basis that the communities identified are unlikely to be critically dependent upon groundwater.

[75] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. & Yeo, M. (2004) An Illustrated Guide to British Upland Vegetation, JNCC, Peterborough, ISBN 1 86107 553 7. [online]. Available at: https://hub.jncc.gov.uk/assets/a17ab353-f5be-49ea-98f1-8633229779a1

Good practice measures

7.5.3 Design mitigation and good practice measures are detailed in **Section 2.5**, including GEMPs in **Table 2-3**.

7.5.4 The adoption of the applicable GEMPs would reduce the probability of an incident occurring and further reduce the magnitude of any incident due to a combination of good site environmental management procedures, including minimised storage soil and peat volumes, soil management, staff training, contingency equipment, and emergency plans.

7.5.5 GEMPs applicable to this chapter are:

- working in or near water;
- working in sensitive habitats;
- watercourse crossings;
- working with concrete;
- soil management; and
- bad weather.

7.5.6 The following appraisal assumes that good practice measures (detailed in GEMPs and a Construction Environmental Management Plan (CEMP)) are implemented on-site. The conditions to prevent pollution and manage drainage will be addressed within the CEMP.

Construction Phase Effects

Modification of hydrological pathways

7.5.7 The Proposed Development has the potential to act as a temporary conduit for the movement of excess runoff/surface flood waters during construction.

7.5.8 This effect may be relevant to the construction of access tracks during the construction phase, with the possibility of causing localised disruption and interruption to flow pathways.

7.5.9 Considering the design mitigation and construction good practice, specifically the working in or near water, working in sensitive habitats, watercourse crossings and soil management GEMPs, the effects listed above would be managed to reduce the likelihood of any modification of hydrological pathways.

Modification of groundwater flows and levels

7.5.10 Excavations for the upgrades to tower foundations could disrupt shallow groundwater systems resulting in the lowering of groundwater levels in the immediate vicinity of the excavations and alterations to flow paths.

7.5.11 Soil water conditions at the Site are likely to be primarily influenced by surface water and direct rainfall, with groundwater having minimal influence due to the type of bedrock and superficial geology present. Therefore, the proposed upgrade works are unlikely to permanently alter groundwater flows. Should any alterations occur, it would be expected that natural conditions of groundwater level and flow would recur in a short timeframe.

7.5.12 Considering the design mitigation and construction good practice, specifically 'Working in Sensitive Habitats', and 'Soil Management' GEMPs, the effects listed above will be managed to reduce the likelihood of any effects to groundwater flows and levels.

Flood risk

7.5.13 Surface flows can be impeded by construction activity in, or adjacent to stream channels and poor choice of track crossing locations. Blockages can be caused by inadequate control of earthmoving plant, sedimentation, and poor waste management, all of which could lead to flooding upstream.

7.5.14 Taking into account the design mitigation and construction good practice, specifically the 'Watercourse Crossing' GEMP, the probability of impacts on flood risk will be reduced.

Pollution Incidents

7.5.15 During the construction phase, oil, fuels, chemicals, unset cement and concrete, waste, and wastewater from construction activities would be present on site. With chemicals and oil being stored and used on-site, there is the potential for an incident. Any pollution incident resulting from the Proposed Development could have a detrimental effect on the water quality of the nearby surface waters, groundwater and / or soils and GWDTE, thereby also indirectly affecting ecology.

7.5.16 Should it be necessary to mix concrete on-site, the measures specified within the 'Working with Concrete' GEMP, will be adhered to.

7.5.17 The major pathways for cement contaminated water to reach surface water bodies are either overland flow (suspended in surface water runoff into drains and watercourses, especially during periods of high runoff rainfall events) or when areas are subject to 'washdown' (e.g. process of using a stream of water to clean a surface). In addition to surface water contamination, pollutants have the potential to infiltrate through soils and to bedrock, which therefore can pollute groundwater resources. Thus, potentially impacting the quality of potable water and any potential GWDTE present.

7.5.18 With the adoption of measures identified in the 'Working in or near Water', 'Working in Sensitive Habitats' and 'Working with Concrete' GEMPs, the potential effects associated with contamination from pollution incidents would be reduced.

Soil erosion and sedimentation

7.5.19 Soil erosion, loss of soil, and sediment generation may occur in areas where the ground has been disturbed during construction, including in situations where engineering activities occur close to, or in watercourses, or where higher velocity surface water flows may occur due to local slopes and drainage design.

7.5.20 Furthermore, requirements for soil excavation, transport, and storage may lead to additional sedimentation issues at locations where construction activities are necessary.

7.5.21 With the adoption of measures identified in the 'Working in or near Water', 'Working in Sensitive Habitats', 'Soil Management' and 'Watercourse Crossings' GEMPs, the potential effects associated with erosion and sedimentation will be reduced.

Loss and compaction of peat and soils

7.5.22 Developments on peat present the potential for losses of peat and soils through excavation and disturbance. Construction of the Proposed Development will involve losses of peat due to excavations associated with upgrades to tower foundations, and potential disturbance of peat due to tracking of heavy plant machinery.

7.5.23 Soil compaction as a result of construction works within the Site may damage the vegetation and result in a reduction in soil permeability and rainfall infiltration, particularly on peaty soils, thereby increasing the potential for longer-term erosion from surface water runoff. This would most likely be caused by tracking of heavy plant machinery.

7.5.24 Stockpiled and unvegetated / exposed areas of soils are at risk of desiccation and erosion by wind and water, also potentially causing soil loss.

7.5.25 Considering the design mitigation and construction good practice, specifically the 'Soil Management' GEMP, the effects listed above would be managed to reduce the effects related to loss or compaction of peat and soils.

Peat instability

7.5.26 Peat slides are a natural occurrence that can occur without human interference, but issues such as removal of slope support or increased loading upon slopes can either increase the likelihood of an event occurring or can increase the scale of the failure.

7.5.27 Furthermore, peat slides affect soil (and associated habitats) and potentially downstream surface water systems where soil inundation can lead to sedimentation reducing water quality and modification in drainage patterns.

7.5.28 Excavated material or other forms of loading on, or immediately above, breaks of slope or any other potentially unstable slopes will be avoided. Artificial drainage would also be routed to ensure flows are not concentrated onto slopes, gully heads, or into excavations.

7.5.29 With the adoption of measures identified in the 'Soil Management' GEMP combined with appropriate good practice, site monitoring and pre-construction awareness training, the potential effects associated with peat instability can be reduced.

7.6 Recommendations and Mitigation

7.6.1 **Chapter 9: Summary of Mitigation Measures** will be implemented during the construction of the Proposed Development, detailing best practice construction management measures, including measures to manage risks associated with construction of the Proposed Development to the environment and human health, such as those associated with pollution and resource use.

7.6.2 Mitigation measures would be monitored by an ECoW throughout construction. Peat instability mitigation measures (mitigation reference 'HYD') is highlighted in **Table 7-2**.

Table 7-2. Additional mitigation measures

Reference	Title	Description
HYD1	Minimising peat instability risk	Key measures to minimise peat instability risk include: • avoidance of removal of slope support; • avoidance of heavy loading on slopes; • good drainage practice to ensure flows not concentrated onto slopes or into excavations; • restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and • creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases.

8. NOISE AND VIBRATION

8.1 Introduction

8.1.1 This section provides the findings of the Noise and Vibration Appraisal (NVA) for the Proposed Development. The purpose of the NVA is to identify the noise and vibration generating activities associated with the Proposed Development and determine whether significant adverse effects are likely at nearby noise sensitive receptors (NSRs).

8.1.2 Additional information which supports this section is presented in the following appendices:

- **Figure 8.1** Construction Activity Areas and NSR Locations;
- **Appendix J** - Relevant Legislation and guidance;
- **Appendix K -** Baseline survey data; and
- **Appendix L** - Construction plant and equipment noise assumptions.

8.2 Information Sources

8.2.1 The following sources of information regarding the Proposed Development have been used to inform this NVA:

- Figure 1.1 Site Location;
- Figure 1.2 Site Layout; and
- Ordnance Survey (OS) AddressBase (2022).

8.2.2 Technical appendices for baseline noise data, source noise data have been prepared which also inform the desktop calculations and appraisal conclusions (**Appendix K and L**).

8.3 Methodology

Study Area

8.3.1 NSRs within 300 m of the existing OHL towers have been included within this appraisal. This is in line with guidance set out in DMRB LA 111[76] which states:

"A Study Area of 300m from the closest construction activity is normally sufficient to encompass noise sensitive receptors."

Noise and Vibration Legislation

8.3.2 The noise and vibration assessment has taken account of the relevant legislation, policy and guidance framework internationally and nationally. These are detailed in **Appendix J: Relevant Legislation and guidance**.

Scope

8.3.3 This appraisal assumes that the Proposed Development's embedded mitigation (Best Practicable Means (BPM) as per BS 5228-1[77]; CEMP; and SSEN Transmission's Noise Management Plan and CTMP documents) will be successfully delivered.

[76] The Highways Agency, Scottish Government, Welsh Assembly Government and the Department for Regional Development Northern Ireland (2011). Design Manual for Roads and Bridges. HE-DMRB-SE LA 111 Revision 2 Noise and vibration.
[77] The British Standards Institution (2014). Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1: 2009 + A1:2014)

8.3.4 Any potential adverse effects that require additional mitigation measures in order that they be avoided/reduced are addressed within the appraisal. Specifically, this NVA covers the potential effects during the Proposed Development's phase as identified in **Table 8-1**:

Table 8-1: Elements scoped in/out of the appraisal

Element	Scoped in or out	Justification
Noise generated by construction activities	Scoped in	NSR proximity to existing OHL, which may result in temporary noise impacts from the Proposed Development.
Noise generated by helicopter activities	Scoped in	NSR proximity to the proposed helicopter flight routes and helicopter operation compounds, which may result in temporary noise impacts from the Proposed Development. A qualitative appraisal of the helicopter noise has been included due to the proximity of noise sensitive receptors to the designated helicopter operation compounds and helicopter flight routes
Vibration generated by construction activity	Scoped out	No pilling activities are associated with the removal of the existing OHL towers and access arrangements between towers 16 to 93). Any vibratory generating activities associated with foundation investigation and upgrade works, reconductoring and access track upgrades between Towers 12 and 15 are more than 300m distance from the nearest NSRs. Therefore, vibration is unlikely to be significant and is not discussed further in this appraisal.
Noise generated by construction Traffic	Scoped out	A detailed Construction Traffic Management Plan (CTMP) will be produced and implemented by the Principal Contractor, in order to reduce the potential effects of the construction traffic on the surrounding road network and NSRs. The CTMP will include the Embedded Mitigation measures and a Noise Management Plan which will be agreed with Argyll and Bute Council and ensure compliance with the relevant EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and guidance set out in BS 5228-1:2009+A1:2014 which covers noise control on construction sites. Potential impacts from construction traffic are therefore not considered to be significant and are therefore not discussed further in this appraisal
Noise generated from the construction Compound/s	Scoped out	Potential impacts from the compounds will be minimised and controlled via the Construction Environmental Management Plan (CEMP), which will be prepared and implemented by the Principal Contractor. The CTMP will be agreed with Argyll and Bute Council roads team as part of pre-commencement conditions in advance of construction. Potential impacts from construction compounds are therefore not considered to be significant and are therefore not discussed further in this appraisal.

Sensitivity of Receptors

8.3.5 NSRs have been identified in line with the guidance provided in Planning and Noise: Planning Advice Note (PAN)[78] and Assessment of Noise: Technical Advice Note (TAN)[79]. The types of NSR considered within this assessment are provided in **Table 8-2** below.

[78] Scottish Government (2011). Planning and Noise: Planning Advice Note 1/2011 (2011) Available at: Planning Advice Note 1/2011: planning and noise - gov.scot (www.gov.scot)
[79] Scottish Government (2011). Assessment of Noise: Technical Advice Note (2011). Available at: https://www.gov.scot/publications/technical-advice-note-assessment-noise/

Table 8-2: NSR Included within Assessment

Sensitivity	Description	Example NSR
High	Receptors where people or operations are particularly susceptible to noise	• residential dwelling; • schools during the daytime; • hospitals/ residential care homes; • places of worship; and • holiday parks

Appraisal Methodology

Construction Activity

8.3.6 Noise from the Proposed Development has been assessed using the BS 5228-1[44] ABC method. This method categorises noise-sensitive receptors based on the existing ambient noise levels. Threshold values are then provided to establish the significance of the impact the Proposed Development noise will have on the NSRs.

8.3.7 Baseline ambient noise levels have been taken from measurements previously carried out by WSP in relation to this project. Individual receptors in this assessment have been allocated a baseline ambient noise level based on their proximity to the nearest noise monitoring location.

8.3.8 **Table 8-3** provides the threshold values used in this assessment.

Table 8-3: Construction noise threshold of potential significant effect at dwellings

Evaluation period	Threshold value (dB $L_{Aeq,T}$)		
	Category A [A]	Category B [B]	Category C [C]
Night-time (23:00-07:00)	45	50	55
Evening and Weekends D	55	60	65
Weekday daytime (07:00-19:00) & Saturday daytime (07:00 – 13:00)	65	70	75

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

D) 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays.

Source: BS 5228-1 Table E.1

8.3.9 The magnitude of change criteria is determined by the difference between the predicted construction noise levels and the ABC threshold values at the receptors and informed by the guidance in BS 5228-1[44] and DMRB[80].

8.3.10 A scale for the magnitude of change for construction noise is shown in **Table 8-4**.

[80] The Highways Agency, Scottish Government, Welsh Assembly Government and the Department for Regional Development Northern Ireland (2011). Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7, HD 213/11 revision 1. Noise and Vibration (2011).

Table 8-4: Construction noise threshold of potential significant effect at dwellings

Magnitude of change	Construction noise level
High	Above or equal to +5 dB above the threshold value*.
Medium	Above or equal to the threshold value and below threshold value* +5 dB.
Low	Above or equal to the baseline noise level, $L_{Aeq, T}$, and below the threshold value*.
Negligible	Below the baseline noise level, $L_{Aeq, T}$.
* Threshold value determined in accordance with	

8.3.11 Construction noise may be considered significant[81] where it is determined that a medium or high magnitude of change will occur for a duration of:

- ten or more days or nights in any 15 consecutive days or nights; or
- a total number of days exceeding 40 in any six consecutive months.

Helicopter Activity

8.3.12 During the dismantling of the existing OHL towers, sections of tower will either be extracted from the site using an ATV or flown out by helicopter depending on the location of the tower. **Figure 1.2 Site Layout** indicates the towers where helicopter extraction will be used.

8.3.13 In terms of the development of a quantitative limit to apply to the temporary use of helicopters, research undertaken by Defra[82] highlights the following:

- no single satisfactory noise index for the measurement or prediction of the impact of helicopter noise on the community
- no good correlation with complaints in relation to commonly used acoustic parameters including L_{Aeq}, L_{Ceq}, LAmax, L_{10} and L_{90}; and
- addressing acoustic noise limits may be unlikely to significantly improve public acceptance of helicopter noise.

8.3.14 The IOA's bulletin from March/April 2010[83] on the public acceptance of helicopters also highlights the lack of correlation with noise complaints associated with helicopter noise and the maximum, or peak, noise level. The bulletin suggests that small helicopters, which generate low overall levels of noise, provoke at least the same level of complaints as larger helicopters which produce much higher noise levels, with a significant factor in noise complaints being the character of the helicopter noise. The more impulsive or tonal the sound, the more likely complaints are to occur.

8.3.15 Other issues discussed are the perceived uncontrolled way helicopters fly with authorities having no power over flight paths and flying heights.

8.3.16 The article concludes that "*the reaction of helicopters and heliports is dependent on several factors, some of which are completely unrelated to the sound generated by the helicopter*". The non-acoustical elements (virtual noise) including concerns about safety and the 'startle effect' of low level flying helicopters often dictates the level of public response to helicopters.

8.3.17 The assessment of potential noise impacts from the helicopter activity is to be based on a qualitative assessment, informed by indicative noise level predictions for this NVA.

[81] "significant" used as per embedded terminology in BS5228-1 and not related to Environmental Impact Assessment (EIA) terminology

[82] Waddington, DC and Kendrick, P, Department of Environment, Food and Rural Affairs (DEFRA) (2008). Research into the Improvement of the Management of Helicopter Noise (DEFRA NANR 235: 2008). Available at: https://usir.salford.ac.uk/id/eprint/30805/1/nanr235-project-report.pdf

[83] Institute of Acoustics (2010). Public Acceptance of Helicopters (IOA Bulletin: March/April 2010)

Appraisal Noise Modelling

8.3.18 A 3D computer noise propagation model was developed using Cadna A® software and ArcGIS. CadnaA acoustic modelling software implements ISO 9613-2[84] and BS 5228[85], which contains standard methods for calculating sound attenuation during outdoor propagation and during construction noise, respectively.

8.3.19 The model is based upon the following input data:

- Defra 1m LIDAR topography data for input into digital terrain model;
- OS AddressBase data for identifying nearest NSRs;
- OS MasterMap data for surrounding buildings and structure; and
- geo-referenced layout drawings for the OHL tower locations and track access routes to tower locations.

8.3.20 The following modelling parameters have been used in the assessment:

- ground absorption: 0.5 (mixed ground) for all areas;
- building heights of 6m with acoustically reflective facades;
- noise levels are calculated at first floor levels (4 m) and calculation points are positioned at the façade of the building; and
- plant, equipment and associated noise levels assumed for the key construction activities are presented in **Appendix L: Construction plant and equipment noise assumptions**.

8.4 Baseline Environment

8.4.1 A baseline noise monitoring survey was undertaken at four locations between 23rd November and 1st December 2021. The purpose of the survey was to evaluate the existing sound climate at the NSRs in proximity to the Proposed Development.

8.4.2 The survey was conducted in accordance with BS 7445[86] using a Class 1 sound level meter as defined in BS EN 61672[87]. The sound level meters were positioned in free-field conditions at approximately 1.5 m above ground level.

8.4.3 The location of the baseline noise monitoring locations is provided in **Table 8-5** and illustrated in **Figure 8.1**.

Table 8-5: Baseline Monitoring Locations

Location	Description	Easting	Northing
LT1	Rural location approximately 60 m northeast of road linking Ardentinny to the A815	218087	688899
LT2	Monitoring location at northern extent of Rashfield, approximately 10 m west of A815	214683	683689
LT3	Rural location approximately 430 m north of the B836 and 600 m west of the A815	214119	682325
LT4	Rural location approximately 400 m west of Sandbank	215941	679961

[84] International Organization for Standardization. (2017) Description, Measurement and Assessment of Environmental Noise (ISO 1996-2:2017)
[85] The British Standards Institution (2014). Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1: 2009 + A1:2014)
[86] The British Standards Institution (2003). Description and Measurement of Environmental Noise – Part 1: Guide to quantities and procedures (BS 7445: 2003)
[87] The British Standards Institution (2003). Electroacoustics — Sound level meters — Part 1: Specifications (BS EN 61672-1: 2003)

8.4.4 **Table 8-6** presents the average daytime noise levels at measurement locations. Only daytime results are provided as construction activities associated with the Proposed Development will only occur during daytime periods.

Table 8-6: Average Daytime Noise Levels

Location	Period	Equivalent Continuous Sound Level (dB, $L_{Aeq,T}$)	Typical Background Sound Level (dB, $L_{A90,T}$)	$L_{A90,1hr}$ dB range	Typical Maximum Event Sound Level (dB, $L_{AFmax,T}$)	Location
LT1	Day (0700-2300)	48 (36 – 63)	37	35 – 55	-	37 – 91
LT2	Day (0700-2300)	55 (45 – 59)	40	38 – 42	-	40 – 64
LT3	Day (0700-2300)	43 (28 – 56)	33	25 – 50	-	32 – 81
LT4	Day (0700-2300)	40 (35 – 44)	37	33 – 40	-	39 – 67

8.4.5 At LT1, LT3 and LT4, the ambient sound level results indicate that the existing sound sources are representative of typical rural locations, with distant vehicle movements occasionally audible. At LT2, measured noise levels are noted to be influenced by the presence of a the nearby A815.

8.4.6 The results presented in **Table 8-6** indicate that ambient noise levels are relatively low at all monitoring locations and characteristic of rural areas. L_{Aeq} levels indicate that the ambient noise levels are well below 65 dB. Therefore, ambient noise levels at NSRs within the Study Area are all below the BS 5228-1 ABC assessment Category A.

8.4.7 The full reported results from the noise survey are presented in **Appendix K: Baseline Survey Data**.

8.5 Appraisal

Towers 12 – 15 (foundation investigation and upgrade works, reconductoring and access track upgrades)

8.5.1 Due to the location of the activities associated with Towers 12 to 15, no NSRs are located within the Study Area surrounding these locations (i.e. no NSRs within 300 m), it is not anticipated that there will be any significant effects from this aspect of the Proposed Development.

Tower 16 to Tower 93 (Removal of the Existing OHL towers and access arrangements)

8.5.2 The majority of the potential adverse effects associated with the dismantling of the existing OHL towers will occur near the existing OHL tower locations, as shown in **Figure 1.2 Site Layout**.

8.5.3 This section of the appraisal discusses the potential adverse effects at NSRs within areas where existing OHL towers are located. The areas where potential adverse effects could occur are in areas such as Barnacabber (Tower 35 – 39) Rashfield (Tower 67 – 71), Invereck (Tower 72 – 75), Eachaig River (Tower 76 – 80) and Ardnadam (Tower 90 – 93).

8.5.4 The areas identified and NSRs within 300m of the noted OHL Tower locations are shown in **Figure 8.1 Construction Activity Areas and NSR Locations**.

8.5.5 At locations Barnacabber, Rashfield, Invereck and Ardnadam the closest NSR to an existing OHL tower is approximately 80 m. At this distance, noise levels would achieve the 65 dB $L_{Aeq,T}$ construction noise threshold during the dismantling of the existing OHL towers, which is a low magnitude of change and a **Minor Adverse** impact.

8.5.6 At Eachaig River there are two NSRs near to existing OHL Tower 67, the closest of which is approximately 30 m distance. Construction noise levels at this distance are predicted to be in the order of 70 dB $L_{Aeq,T}$ which is in excess of the 65 dB $L_{Aeq,T}$ construction noise threshold and of medium

magnitude of change. As the activity at OHL Tower 67 is not expected to be present for 40 or more days in the six months programme and is therefore considered as a **Minor Adverse** impact.

8.5.7 Construction noise associated with the cutting up of dismantled OHL Tower sections at helicopter operation compounds is also noted to readily comply with the 65 dB $L_{Aeq, T}$ construction noise threshold during the dismantling of the existing OHL towers, which is a low magnitude of change and a **Minor Adverse** impact.

8.5.8 The construction noise levels provided above are representative of construction activities when they occur at the nearest existing OHL tower locations to the areas discussed. During activities where OHL dismantling is occurring at more distant OHL tower locations, noise levels at the identified locations will be much lower.

8.5.9 All construction activities are noted to be temporary, with the schedule for the dismantling of the existing OHL proposed to be 6 months in duration (see **Table 2-2**). Within this timeframe, activities will stop and start along the existing OHL, with construction noise only having the potential to occur where the existing OHL towers are yet to be dismantled.

8.5.10 Potential adverse effects from construction vehicles travelling along existing access tracks (as detailed within the Dunoon to Loch Long 132 kV OHL Rebuild Project s37 application) or on proposed ATV routes are considered unlikely. This is due to the transient nature of construction vehicle movements over any given day. As a basis for the above conclusion, the Framework Construction Traffic Management Plan (**Appendix B**) provides data on the total Heavy Goods Vehicle (HGV) trips for the Dismantling & Reinstatement activity, which is considered representative of the Proposed Development. Based on the data provided in the CTMP, HGV movements from a single site access point to an existing OHL tower location, are expected to generate between approximately 1 and 20 vehicle movements per day.

8.5.11 It is expected that the HGV construction vehicles movements noted above will be noticeable where access tracks are in close proximity to nearby NSRs, however the activity will generate noise emissions for a relatively brief period of a given day and is expected to readily achieve the 65 dB $L_{Aeq, T}$ construction noise threshold.

8.5.12 Based on the discussion above, it is not anticipated that there will be any significant effects from Proposed Development noise on nearby NSRs.

Helicopter Noise

8.5.13 The use of helicopters during the project has the potential to cause significant effects when operating near to NSRs. There is provision for helicopters to be used to assist with the dismantling of the existing Towers 16 to 69. Where required, helicopters will be used to transport steel sections of the from the towers being dismantled to nearby helicopter operation compounds, where they will be dismantled further. Proposed helicopter flight routes and the three helicopter operation compounds located in Barncabber and one at Stronchullin, are shown on **Figure 1.2 Site Layout**.

8.5.14 Indicative noise emission predictions indicate that during days where helicopters support is required, five helicopter flights would result in noise levels in the order of 65 dB $L_{Aeq, T}$ at NSRs 300 m distance from the nearest proposed helicopter flight route. If only one helicopter movement was to occur during a day, the noise levels at 300 m from the helicopter flight route are expected to be in the order of 60 dB $L_{Aeq, T}$.

8.5.15 As non-acoustical elements (virtual noise) including concerns about safety and the 'startle effect' of low-level flying helicopters often dictate the level of public response to helicopters, mitigation measures to reduce the potential for significant effects are identified relating to the operation of the helicopters and the provision of information to the public on expected helicopter activity duration, number of flights,

flight paths, safety measures and contact details enabling local residents to contact helicopter operators or the Principal Contractor.

8.6 Recommendations & Mitigation

8.6.1 The specific mitigation presented below, in addition to the Proposed Development's embedded mitigation (such as construction BPM in line with BS 5228-1; CEMP; SSEN Transmission's Noise Management Plan and CTMP documents), will be adopted to ensure that noise emissions from the Proposed Development are both avoided where possible or mitigated.

Helicopter Noise Mitigation / Management (NV1)

8.6.2 The assessment identifies the potential for significant effects during the proposed helicopter operations associated with the dismantling of the existing OHL towers.

8.6.3 Due to the nature of helicopter noise, specific measures that can be undertaken to reduce noise generated at the source are limited. Mitigation measures generally relate to the operation of the helicopters, rather than specific measures that can be taken to reduce the noise generate at the source.

8.6.4 Mitigation measures that will be adopted are detailed below:

- provision of information to the public on expected helicopter activity duration, number of flights, flight paths, in particular for those dwellings within a set-back distance of 300m from proposed helicopter flight routes;
- provision of information to the public related to the aircraft operation and methods of ensuring the safety of both the local residents and helicopter operators;
- helicopter fleet will be selected to provide quieter helicopter operation as practicable;
- review of the locations of helicopter routes and tower assembly areas to maximise the separation distance from NSRs;
- provide contact details for a nominated site contact for local residents to contact with complaints and for engaging with local residents;
- training of helicopter operatives to raise awareness of noise, nearby NSRs and the importance of reducing impacts where practicable and safe to do so;
- restrictions on activities to allow for a reduction of potential effects e.g. helicopter flights limited to between 0900 – 1900 hours, to ensuring some rest bite for local residents within setback area; and
- where practicable, helicopter activities locations are to be scheduled to allow rest bite on Sundays in areas near to residential receptors.

8.6.5 Following the successful implementation of the embedded and additional specific mitigation measures relating to helicopter noise, there are no anticipated significant residual effects from the Proposed Development.

9. SUMMARY OF MITIGATION MEASURES

9.1.1 The sections above highlight the potential environmental risks and present mitigation measures for managing these risks.

9.1.2 Table 9-1 lists the design, general and additional mitigation proposed within this document. The CEMP will include these protection measures.

Table 9-1: Schedule of Mitigation

Ref	Title	Description
GE1	General Environmental Management Plans	• Oil storage and refuelling; • Soil management; • Working in or near water; • Working in sensitive habitats; • Working with concrete; • Waste management; • Private water supplies; • Forestry; • Dust management; • Biosecurity on land; • Restoration; and • Bad weather.
GE2	Species Protection Plans	• Badger; • Bat; • Bird; • Fresh Water Pearl Mussel; • Otter; • Red squirrel; and • Pine marten.
GE3	Noise Management Plan	The Contractor will be required to produce and implement a Noise Management Plan for their construction activities. The plan will be agreed with the Argyll and Bute Council. This will ensure compliance with the relevant EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and guidance set out in BS 5228-1:2009+A1:2014 which covers noise control on construction sites.
GE4	Site Water Management Plan	A Site Water Management Plan will be developed to manage potential risks to the water environment including locations for silt mitigation measures, dewatering of excavations inclusive of pump locations, monitoring points, cut off drains, and SuDS (incl. compound). In addition, this plan will show how rivers downstream will be protected from sedimentation or pollution resulting from the project activities. The Site Water Management Plan will include details of the layout of the Proposed Development, as well as any access tracks detailing all locations of water mitigation measures. All relevant activities will be undertaken in compliance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011[88] (as amended). GEMPs for 'Oil Storage and Refuelling', 'Soil Removal, Storage and Reinstatement', and 'Working with Concrete' will be adhered to.

[88] Scottish Government (2011). The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Available at: https://www.legislation.gov.uk/ssi/2011/209/contents/made

Ref	Title	Description
GE5	Construction Traffic Management Plan	A Construction Traffic Management Plan will be developed by the Contractor, which will be agreed with Argyll and Bute Council roads team as part of pre-commencement conditions in advance of construction; a Framework CTMP is provided in **Appendix B, which** covers these works and the wider Dunoon to Loch Long 132 kV OHL Rebuild Project works.
GE6	Emergency	An Environmental Emergency Response Plan will be developed by the contractor to deal with, among other things, accidental spills / leaks. Appropriate oil spill kits will be located on site and in key vehicles. Site staff will be trained in their use and provided with advice on action(s) to be taken and who should be informed in the event of a pollution incident. Emergency response teams and contractors, their locations and response times will be identified in the plan.
GE7	Welfare facilities	On-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of an on-site septic tank with soak away, tankering and off-site disposal depending on agreement with SEPA; or discharge to foul sewer.
GE8	Car Sharing	Adoption of car sharing where possible to reduce the number of vehicles arriving and departing from the site.
GE9	Local residents	Local residents will be kept informed of any potentially disruptive activities and actions being taken to mitigate the impact of these activities.
GE11	Validity of Baseline Conditions	Where construction has not commenced within 12 months and conditions for species may have changed, protected species surveys will be repeated in order to provide the most accurate and up to date recommendations for the Site.
BD1	Reptiles and amphibians	If a reptile/amphibian is sighted or suspected, the nearby vegetation should be gently disturbed by hand to encourage the reptile/amphibian to move off of its own accord. Reptiles/amphibians incidentally encountered on site should not be handled unless under instruction by the ECoW and by gloved hand, and to transport the reptile/amphibian to a place of safety (e.g., further away from construction works). The appointed ECoW and contractors should also refer to the following standard industry guidance for supplementary advice: • Amphibians and Reptiles Group UK Advice Note 10: Reptile Survey and Mitigation Guidance for Peatland Habitats (https://www.arguk.org/info-advice/advice-notes) • NatureScot Standing Advice for Reptiles (www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species)
BD2	Pre-construction Survey	In accordance with the Bird SpPP, pre-construction black grouse lek surveys will be undertaken within 1.5 km of the Site (including helicopter routes) across the northern and central sections of the OHL alignment. Surveys should encompass the dawn period, one hour before sunrise to two hours after and could be undertaken by the ECoW if suitably qualified. If works are scheduled to commence within the March to May period pre-construction surveys must be undertaken the previous year.
BD3	Construction Mitigation	No helicopter flight routes will be permitted within 1000 m of any identified lek sites during the period March to May inclusive during the peak lekking periods (one hour prior to sunrise until two hours after sunrise and two hours before sunset to one hour after). The above default stand-off distance will be implemented until and unless pre-construction surveys identify that lekking ends earlier or later than 2 hours after sunrise. A flight plan will be developed to show identified lek sites and exclusion zones.
BD4	Construction Mitigation	For all other works a default stand-off distance of 750 m from identified lek sites will be applied. As above the timings of the stand-off period will be determined by lekking activity recorded during the pre-construction surveys. The default stand-off will apply from March to May inclusive during the peak lekking periods (one hour prior to sunrise until two hours after sunrise and two hours before sunset to one hour after). The stand-off distance of 750 m is a

Ref	Title	Description
		precautionary distance that may be revised following an evaluation by the ECoW of factors including the nature of works proposed in the area and the line of sight between the works and the lek (e.g., hills or woodland could screen the works).
HYD1	Minimising peat instability risk	Key measures to minimise peat instability risk include: • avoidance of removal of slope support; • avoidance of heavy loading on slopes; • good drainage practice to ensure flows not concentrated onto slopes or into excavations; • restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and • creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases.
NV1	Helicopter Noise	Mitigation measures that will be adopted are detailed below: • provision of information to the public on expected helicopter activity duration, number of flights, flight paths, in particular for those dwellings within a set-back distance of 300m from proposed helicopter flight routes; • provision of information to the public related to the aircraft operation and methods of ensuring the safety of both the local residents and helicopter operators; • helicopter fleet will be selected to provide quieter helicopter operation as practicable; • review of the locations of helicopter routes and tower assembly areas to maximise the separation distance from NSRs; • provide contact details for a nominated site contact for local residents to contact with complaints and for engaging with local residents; • training of helicopter operatives to raise awareness of noise, nearby NSRs and the importance of reducing impacts where practicable and safe to do so; • restrictions on activities to allow for a reduction of potential effects e.g. helicopter flights limited to between 0900 – 1900 hours, to ensuring some rest bite for local residents within setback area; and • where practicable, helicopter activities locations are to be scheduled to allow rest bite on Sundays in areas near to residential receptors.

APPENDIX A: FIGURES

APPENDIX B: FRAMEWORK CONSTRUCTION TRAFFIC MANAGEMENT PLAN

APPENDIX C: GEMPS AND SPPS

APPENDIX D: LANDSCAPE AND VISUAL METHODOLOGY

APPENDIX E: CULTURAL HERITAGE GAZZETEER

APPENDIX F: HABITATS DATA

APPENDIX G: PROTECTED SPECIES DATA

APPENDIX H: CONFIDENTIAL BADGER DATA

APPENDIX I: ORNITHOLOGY DATA

APPENDIX J: RELEVANT NOISE LEGISLATION AND GUIDANCE

APPENDIX K: NOISE BASELINE SURVEY DATA

APPENDIX L: CONSTRUCTION PLANT AND EQUIPMENT NOISE ASSUMPTIONS