Scottish & Southern Electricity Networks

TRANSMISSION

Consultation Document - Route Selection

Tomchrasky Wind Farm Connection

REF: LT496 / LT497

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Scottish & Southern Electricity Networks
TRANSMISSION

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GLOSSARY

Term	Definition
Alignment	A centre line of an overhead line OHL, along with location of key angle structures.
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SHE Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Conductor	A metallic wire strung from structure to structure, to carry electric current.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Corridor	A linear area which allows a continuous connection between the defined connection points. The corridor may vary in width along its length; in unconstrained areas it may be many kilometres wide.
Environmental Impact Assessment (EIA)	A formal process set down in The Electricity Works (EIA) (Scotland) Regulations 2000 (as amended in 2008) used to systematically identify, predict and assess the likely significant environmental impacts of a proposed project or development.
Gardens and Designed Landscapes (GDLs)	The Inventory of Gardens and Designed Landscapes lists those gardens or designed landscapes which are considered by a panel of experts to be of national importance.
Groundwater Dependent Terrestrial Ecosystems (GWDTEs)	GWDTEs are types of wetlands that are specifically protected under the Water Framework Directive.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Kilovolt (kV)	One thousand volts.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
National Scenic Area (NSA)	A national level designation applied to those landscapes considered to be of exceptional scenic value.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Riparian Woodland	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
Route	A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified pinch points / constraints), which provides a continuous connection between defined connection points.

Term	Definition
Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process under Section 37 of the Electricity Act 1989.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Span	The section of overhead line between two structures.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Landscape Area (SLA)	Landscapes designated by The Highland Council which are considered to be of regional/local importance for their scenic qualities.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Stakeholders	Organisations and individuals who can affect or are affected by SHE Transmission works.
Study Area	The area within which the corridor, route and alignment study takes place.
Terminal Structure	A structure (tower or pole) required where the line terminates either at a substation or at the beginning and end of an underground cable section.
The National Grid	The electricity transmission network in Great Britain.
Volts	The international unit of electric potential and electromotive force.
Wayleave	A voluntary agreement entered into between a landowner upon whose land an overhead line is to be constructed and SHE Transmission
Wild Land Area (WLA)	Those areas comprising the greatest and most extensive areas of wild characteristics within Scotland.

PREFACE

This Consultation Document has been prepared by AECOM on behalf of Scottish Hydro Electric Transmission plc (SSEN Transmission). SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc, owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands. This document invites comments from all interested parties on the route options for a new 132 kV Overhead Line (OHL) supported by steel trident pole structures to connect the proposed Tomchrasky Wind Farm to the National Grid at the proposed Bingally substation.

The Consultation Document is available online at the project website: https://www.ssen-transmission.co.uk/projects/project-map/tomchrasky-wind-farm-connection/.

Public consultation events detailing the proposals described in this document have been held at the following times and locations:

- Tuesday 29 October 2024 – Cannich Hall, Cannich 4-7.30pm
- Wednesday 30 October 2024 – Glenmoriston Millenium Hall, Invermoriston 2-7pm

Following the initial routing consultation event and feedback period, a further consultation period will close on Friday 21st February 2025, to allow stakeholders and consultation event attendees to review this consultation document.

All comments are requested by Friday 21st February 2025.

Comments on this document should be sent to:

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EXECUTIVE SUMMARY

Scottish and Southern Electricity Networks Transmission (SSEN Transmission) operating under license held by Scottish Hydro Electric Transmission plc, is proposing to construct a new 132kV Overhead Line (OHL) from the connection between the proposed Tomchrasky Wind Farm substation and the proposed Bingally 400/132 kV substation, south of Tomich. A number of new temporary and permanent access tracks will also be required.

This Consultation Document describes the route options appraisal undertaken and the alternatives considered during the selection of route options for the Tomchrasky Wind Farm Overhead Line Grid Connection project. It forms part of a consultation exercise to provide information on the project and seek comment from stakeholders and members of the public on the proposals.

SSEN Transmission has a statutory duty under Schedule 9 of the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical transmission system in its licenced areas. SSEN Transmission has obligations to offer non-discriminatory terms for connection to the transmission system. In line with these duties and obligations, SSEN Transmission has entered into an agreement with the wind farm developer to provide a connection from the proposed wind farm to the National Grid.

The approach to route selection is being informed by SSEN Transmission's guidance 'Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above' which provides a framework to ensure environmental, technical and economic considerations are identified and appraised at each stage of the routeing process. Six route options in total were assessed by the project team including input from an experienced environmental consultant and SSEN Transmission OHL engineers.

The appraisal identified physical, technical and environmental constraints in all of the route options which were assessed. The principal findings of the appraisal in terms of key differences between the route options are presented in more detail in this document.

1. INTRODUCTION

1.1 Purpose of Document

1.1.1 This document has been prepared by Scottish and Southern Electricity Networks Transmission (SSEN Transmission). SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc, owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands. This document invites comments from all interested parties on the proposed route options for the 132 kV overhead line connection between the proposed Tomchrasky Wind Farm substation and the proposed Bingally 400/132 kV substation, south of Tomich.

1.1.2 This document outlines the proposed route options and describes the appraisal undertaken. Comments are now sought from statutory authorities, key stakeholders, elected representatives and the public on the route options and the route selection process. All comments received will inform further consideration of the proposed route, and subsequent alignment[1] options therein.

1.1.3 This document supports the information made available to the public and statutory authorities as part of ongoing consultation. This Consultation Document, along with project details, is available online at the project website: https://www.ssen-transmission.co.uk/projects/project-map/tomchrasky-wind-farm-connection/.

1.2 Document Structure

1.2.1 This report is comprised of eight sections as follows:

1. Introduction – sets out the purpose of the Consultation Document and document structure.
2. Project Background and Need – describes the need for the proposals.
3. Project Overview – sets out the preferred technology solution, the alternatives considered and outlines the typical construction methods.
4. Route Selection Process – sets out the route selection process and methodology that has been applied to date.
5. Description of Routes – describes the route options that have been identified.
6. Environmental Baseline – describes the local context and baseline environmental.
7. Comparative Analysis – comparative analysis of the route options from an environmental, technical and economic perspective.
8. Summary and Next Steps – invites comments on the route assessment process and route options.

1.2.2 The main body of this document is supported by a series of figures which are included at the end of this document (**Appendix 1: Figures**).

[1] A centre line of an overhead line, along with the location of key angle structures.

2. PROJECT BACKGROUND AND NEED

2.1 The Need for the Project

2.1.1 SSEN Transmission is a wholly owned subsidiary of the SSE plc group of companies. SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland and holds a license under the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

2.1.2 The proposed Tomchrasky Wind Farm developer, E-Power, has had a connection offer accepted for 74.4 megawatts (MW) by 31st October 2029. Under the terms of their license, SSEN Transmission are therefore obliged to connect the Developer to their transmission network by the contracted connection date. The proposed Tomchrasky Wind Farm requires connection to SSEN Transmission's electricity transmission network at the proposed 400/132 kV Bingally substation, south of Tomich. The connection will be achieved via the construction and operation of a single 132 kV circuit to be achieved via steel lattice or trident pole OHL.

2.1.3 The proposed 132 kV OHL route is in line with SSEN Transmission's commitment and licence obligation to facilitate the connection of renewables to the grid through an economical, efficient, and coordinated approach to transmission reinforcement.

2.2 National Planning Policy

2.2.1 Scotland's fourth National Planning Framework (NPF4) was published by the Scottish Government on 13th February 2023. NPF4 is a long-term strategy for Scotland (to 2045) that guides spatial development, sets out national planning policies, designates national developments and highlights regional spatial priorities. Alongside adopted local development plans, NPF4 now forms part of the statutory development plan for decision making in Scotland. In NPF4, transmission infrastructure is supported in both National Development ND3 'Strategic Renewable Electricity Generation and Transmission Infrastructure' and in Policy 11 Energy however proposals are required to be assessed against all relevant development plan policies.

2.2.2 The Proposed Development would form a vital element to deliver network and grid infrastructure required to deliver the UK and Scottish Government's legally binding targets for net zero emissions and renewable energy electricity generation objectives.

3. PROJECT OVERVIEW

3.1 Preferred Technology Solution

3.1.1 The proposal is a single circuit 132 kV trident pole arrangement to support the overhead line running over a distance of up to approximately 16 kilometres, from the proposed Tomchrasky Wind Farm 132 kV substation to the proposed Bingally 400 kV substation. The average height of the trident poles is 10–18 meters, with an average span of between 75–100 meters. A number of new permanent and temporary access tracks will also be required. Photographs showing typical steel and wood trident poles are shown in Figure 3-1 below.

3.1.2 A typical steel "H" pole (also referred to as an East or H-frame), with an average height of 13 m, installation requires foundations of approximately 2.5 m by 3 m across and to a depth of around 2 m. Figure 3-1 shows a typical example of a steel trident pole and OHL. A typical "H" wood pole installation requires foundations of approximately 2.5 m by 3 m across and to a depth of around 2 metres. Figure 3-1 shows a typical example of an wood pole which requires additional stays. Note that stays are not usually required on non-angle poles unless ground or weather conditions dictate.

Figure 3-1 Typical layout of wood and steel trident poles

3.1.3 Access tracks will only be constructed where access by all-terrain vehicles or the use of trackway is not feasible. Access tracks will be constructed with imported and/or locally sourced material. Existing access tracks along the existing Beauly to Denny OHL will be utilised where possible; however, new access tracks may be needed in sections.

3.1.4 Use of steel trident poles is the preferred engineering solution for the OHL elements of the Proposed Development.

3.2 Alternative Options Considered

3.2.1 Prior to selecting the H frame/pole as the preferred technological solution for this project, a range of technology options were considered, including appropriate overhead methods. The criteria considered included technical (safety, access and ease of construction, security of supply, meets windfarm connection requirements), environmental (land use, landscape and visual, protected species, habitats, cultural heritage) economic (capital and operational costs) and operational (ease of maintenance, safety, restoration of supply).

3.2.2 H-frame steel poles emerged as the most viable option for the 132 kV overhead line in Tomchrasky. These poles offer superior structural performance compared to wood poles, with fewer supports needed per kilometre and moderate risks related to uplift and land take. While they may involve higher initial costs and more planning, their long-term durability and reduced maintenance needs make them a more reliable and sustainable choice for this project, particularly in a location with challenging environmental conditions.

3.2.3 H-frame wood poles are a moderately viable option. They present fewer high-risk factors in terms of durability, ease of installation, and temporary works, making them suitable for short-term, low-cost projects. However, their limitations in structural capability and the need for more supports per kilometre raise concerns about their long-term viability in a harsh and remote environment like Tomchrasky. Though cost-effective in the short term, wood poles would likely require more frequent maintenance and replacement.

3.2.4 Monopoles structures, while technically advanced with fewer supports per kilometre, are the least viable option due to high upfront costs, visual impact, and complex temporary works. Their installation would require substantial resources and specialized planning, making them less practical for a remote, location like Tomchrasky. While their low maintenance requirements are appealing, the significant initial investment and logistical complexity outweigh the benefits in this particular setting.

3.2.5 Steel lattice towers are the least viable option for the 132 kV overhead line in Tomchrasky due to their high installation complexity, land take, and visual impact. While they provide strong structural performance, the additional costs and logistical challenges associated with these towers make them less suitable for this project. H-frame steel poles offer a much more practical and cost-effective solution.

3.3 General Construction Activities

3.3.1 To facilitate the connection, the main construction elements associated with the development are anticipated to include:

- Improvements to the public road network (if required);
- Establishment of suitable laydown areas / construction compounds for materials and installation of temporary track solutions (e.g. Trackway), as necessary;
- Upgrades to existing tracks and potentially new tracks where required;
- Delivery of structures and materials to site;
- Assembly and erection of pole structures and stays; and
- Stringing of conductors using hauling ropes and winches.

3.3.2 Installation of the poles would involve the following tasks:

- Excavation of a suitable area for the poles, and backfilling after installation of the pole (backfilling would generally be carried out the same day as excavation so that no open excavations are left overnight). The exact area would depend on the ground conditions at each pole;
- In some pole locations, it may be necessary to add imported hardcore backfill around the pole foundations to provide additional stability in areas where the natural sub soils have poor compaction qualities;

- Conductors would be installed on the poles using full tension stringing to prevent the conductor coming into contact with the ground; and
- Remedial works would be carried out to reinstate the immediate vicinity of the structures, and any ground disturbed, to pre-existing use. This would be undertaken using excavated material.

3.4 Other considerations

Forestry Removal

3.4.1 Construction of the project may require the removal of sections of forestry, although detailed design would seek to minimise the impact of any removal. This would be undertaken in consultation with affected landowners. Scottish Forestry will be consulted, and the project will comply with the Scottish Government's Control of Woodland Removal Policy[2].

Access

3.4.2 Vehicle access is required to each pole location during construction to allow excavation and creation of foundations and pole installation. Existing tracks would be used where possible. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route. However, both temporary and permanent stone tracks may be necessary in some areas depending on existing access conditions, terrain and altitude.

Programme

3.4.3 It is anticipated that construction of the project would take place over an approximately 22-month period following the granting of consents, although detailed programming of the works would be the responsibility of the Contractor in agreement with SSEN Transmission.

[2] Forestry Commission Scotland (2009). *Control of Woodland Removal Policy.* [Online] [Accessed: 08/01/2025] available from: https://www.forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal

4. ROUTE SELECTION PROCESS

4.1 Overview

4.1.1 The approach to route selection has followed formal internal guidance to enable a consistent and rigorous selection of potential route options.

4.1.2 The guidance develops a process which aims to balance environmental, technical, and economic considerations throughout the route options process, and helps SSEN Transmission to meet its obligations under Schedule 9 of the Electricity Act 1989.

4.1.3 The guidance splits a project into the following principal routeing stages:

- Pre-Routeing Activities: Selection of proposed connection option (summarised in **Section 3.2** of this document);
- Stage 0: Routeing strategy development;
- Stage 1: Corridor Selection;
- Stage 2: Route Selection; and
- Stage 3: Alignment Selection.

4.1.4 The stages that are carried out can vary depending on the type, nature of and size of a project and consultation is carried out at each stage of the process. This project is currently at Stage 2: Route Selection.

4.2 Pre-Routeing Activities

4.2.1 The starting point in all routeing projects is to establish the need for the project and to select the favoured strategic option to deliver it. A strategic options appraisal, which assessed a number of technology options, was undertaken. Various technical, environmental, economic and operational criteria were used to assess the technology options. The technology options considered are summarised in **Section 3.1** of this document.

4.3 Stage 0 – Routeing Strategy Development

4.3.1 The routeing strategy development stage seeks to set out the overall approach to the routeing study, the methods which will be adopted to identify, appraise and select options at each stage, and the overall consultation strategy. It will also highlight any departures from the Routeing Guidelines that are required. A Routeing Strategy Report has been produced for this project.

4.4 Stage 1 – Corridor Selection

4.4.1 The corridor selection stage seeks to identify a series of linear areas (corridors) capable of providing a continuous connection between the defined connection points and delivering the required transmission connection. Due to the close proximity of the two connection locations, this project did not undertake Stage 1 – Corridor Selection, rather went straight to Stage 2 –Route Selection.

4.5 Stage 2 – Route Selection

4.5.1 This project is currently at the route selection stage and in consideration of the principles outlined in the guidance, the method of identifying route options in this study has involved the following key tasks:

- Identification of the baseline situation;
- Identification of alternative route options; and
- Environmental, technical and economic analysis of route options.

4.5.2 This stage will result in the identification of a single preferred route option.

4.6 Stage 3 – Alignment Selection

4.6.1 The alignment selection will seek to identify an alignment within the chosen preferred route and to define the access arrangements adapted in terms of, for example, the nature and extent of temporary and/or permanent tracks and road improvements. This stage will be subject to further study and consultation. A separate Alignment Selection Consultation Document will be produced.

4.7 Area of Search

4.7.1 Following completion of the Strategic Options Appraisal, six route options (Route Options A, A1, B, C, D and E) were developed through consideration of a Red, Amber, Green (RAG) rating which ranked potential environmental, engineering and economic effects. Baseline studies have been focused within the 1km wide route options, although consideration of potential receptors outside this area (e.g. environmental designations, visual receptors or cultural heritage sites) has been undertaken and is referenced where relevant in this report. The area of search and route options are detailed in the Location Plan in **Figure 4-1, Appendix 1**.

4.8 Route Identification and Selection Methods

4.8.1 Route options were identified following site appraisals, taking into account the most notable constraints identified during the baseline studies. The following has been taken into account as far as practicable at this routeing stage and will be considered in more detail during Stage 3 – Alignment Selection:

- Avoid, if possible, major areas of highest amenity value (including those covered by national and international designations and other sensitive landscapes);
- Avoid by deviation, smaller areas of high amenity value;
- Try to avoid sharp changes of direction and reduce the number of larger angle towers required;
- Avoid skylining the route in key views and where necessary, cross ridges obliquely where a dip in the ridge provides an opportunity;
- Target the route towards open valleys and woods where the apparent height of towers will be reduced and views broken by trees (avoid slicing through landscape types and try to keep to edges and landscape transitions);
- Technical issues related to clearances, connectivity, outages, maintenance, faults; and
- Any other project specific requirements.

4.8.2 Indicative route options have been identified at 1 km widths to allow for subsequent identification of alignment options during the next stage of the process (Stage 3 – Alignment Selection).

4.9 Route Option Appraisal Method

4.9.1 Appraisal of route options has involved systematic consideration against the following environmental, technical and economic topic areas, as specified in the SSEN Transmission guidance:

Environmental

- Natural Heritage (Designations, Protected Species, Habitats, Ornithology and Geology, Hydrogeology and Hydrology).
- Cultural Heritage (Designations and Cultural Heritage Assets).
- People (Proximity to Settlements, Visual and Physical Effects).
- Landscape & Visual (Designations, Character and Visual Impact).

- Land Use (Agriculture, Forestry and Recreation).

Technical

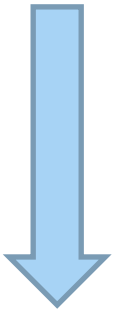
- Environmental Design (e.g. altitude, route complexity, length);
- Topography (e.g. terrain, waterbodies, slope);
- Ground Conditions (e.g. peat, rock and potential for flooding);
- Access and Existing Infrastructure (e.g. existing road network and access tracks);
- Existing Network (e.g. connectivity and outages); and
- Operational (e.g. maintenance, flexibility for future development, and faults).

Cost

- Construction;
- Diversions;
- Public Road Improvements;
- Felling; and
- Land Assembly.

4.9.2 A RAG rating has been applied to each subject area indicating potential effects. This rating is based on a four-point scale shown in **Plate 4.1** below:

Plate 4.1: RAG Ratings

Performance	Appraisal
Most Preferred  Least Preferred	No potential for the infrastructure design development to be constrained
	Low potential for the infrastructure design development to be constrained
	Moderate potential for the infrastructure design development to be constrained
	High potential for the infrastructure design development to be constrained

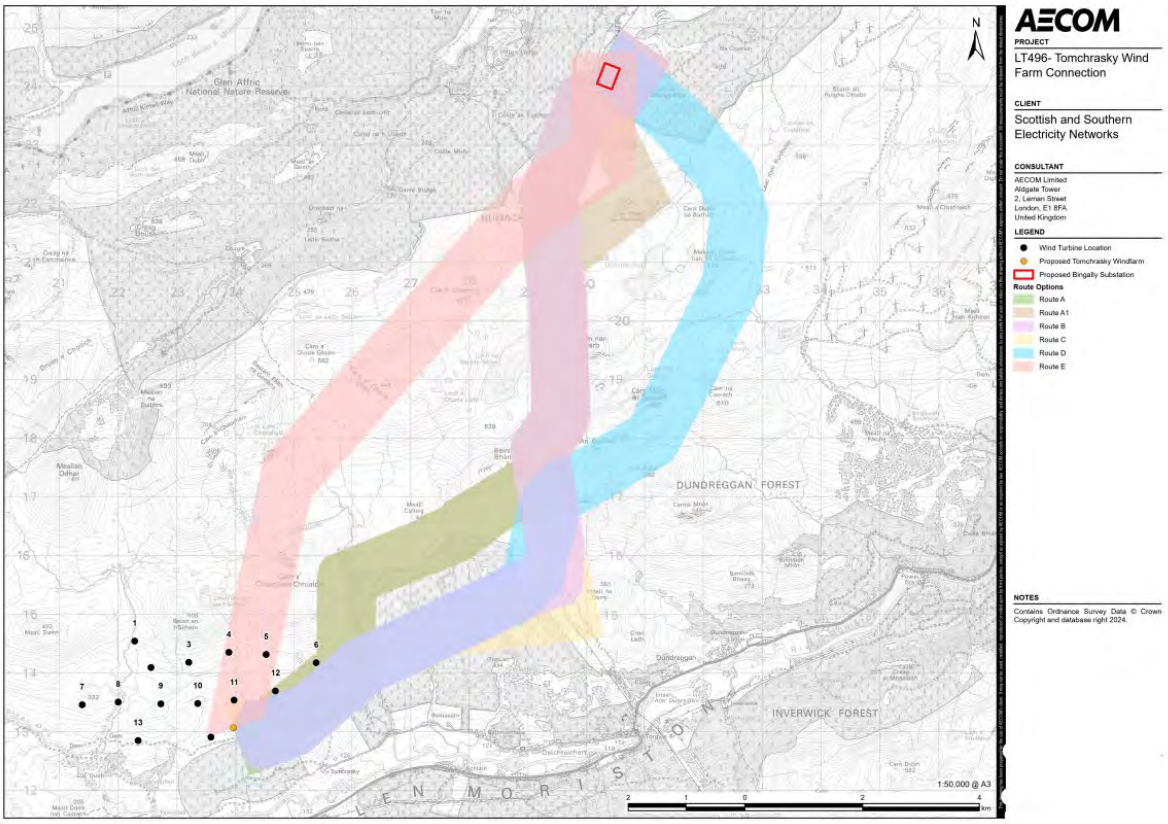
4.10 **Objective of Route** Appraisal

4.10.1 The overall objective throughout the appraisal of route options has been to take full consideration of all environmental, engineering and economic factors to minimise any potential adverse impacts on the environment whilst taking into account technical and cost considerations.

5. DESCRIPTION OF ROUTES

5.1.1 A description of each route option is provided below in this Section and are shown on **Plate 5.1** (see also **Figures 4-1, Appendix 1**). There are six route options in total.

Plate 5.1: Route Options



5.2 Route Option A

5.2.1 Route Option A is shown on **Figure 5-1, Appendix 1** and is approximately 15.2 km in length. Route Option A travels north from Tomchrasky Wind Farm substation travelling adjacent to the Dundreggan forestry plan and then east adjacent to the Glen Affric Wild Land Area (WLA). Route Option A then follows the route of the existing Beauly-Denny OHL north to the proposed Bingally substation.

5.2.2 Route Option A passes through a small area of the Glen Affric National Nature Reserve. Route Option A passes through five area of Class 1, nationally important deep peat, therefore there is potential for Route Option A1 to compromise the integrity of GWTDEs.

5.2.3 Route Option A contains two small areas of Ancient Woodland including an area approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm substation and an area approximately 1.2 km southwest of the proposed Bingally substation. The closest other nationally important designation is the Glen Moriston SAC is approximately 670 m south of Route Option A.

5.2.4 Route Option A is over 1 km south of the closest Scheduled Monument Balnacarn, township SM1142. The closest Listed Building is equidistant to the northernmost extents of all route options at the proposed Bingally substation this is the Category C listed Achanagleish Cottage approximately 1.5 km northwest of the northernmost extents of all route options.

5.2.5 The Tomich Village C onservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.2.6 The closest residential dwelling to Route Option A is 680 m southeast.

5.3 Route Option A1

5.3.1 Route Option A1 is shown on **Figure 5-2, Appendix 1** and is approximately 15.5 km in length. Route Option A1 travels north then east from the proposed Tomchrasky Wind Farm substation travelling adjacent to the Dundreggan forestry plan and Glen Affric WLA. Route Option A1 then proceeds to follow the route of the existing Beauly-Denny OHL north to the proposed Bingally substation.

5.3.2 Route Option A1 contains a small area of Ancient Woodland approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm substation. Route Option A passes through five area of Class 1, nationally important deep peat, there is therefore potential for Route Option A1 to compromise the integrity of GWTDEs. Route Option A1 passes through one area of Ancient Woodland, approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm Substation. Route A1 does not pass through any other natural heritage designations.

5.3.3 Route Option A1 passes next to the boundary of the Glen Affric WLA. All route options apart from Route Option E cross through the north of the Tomchrasky Wood forestry plan[7]. Route Option A1 also passes through a small area in the north of the Dundreggan forestry plan.

5.3.4 The closest Scheduled Monument Balnacarn, township SM1142, is over 1 km south for Route Option A1. The closest Listed Building is equidistant to the northernmost extents of all route options at the proposed Bingally substation this is the Category C listed Achanagleish Cottage approximately 1.50 km northwest of the northernmost extents of all route options.

5.3.5 The Tomich Village Conservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.3.6 The closest residential dwelling to Route Option A1 is 680 m southeast.

5.4 Route Option B

5.4.1 Route Option B is shown on **Figure 5-3, Appendix 1** and is approximately 15.3 km in length. Route Option B travels northeast from the proposed Tomchrasky Wind Farm substation through the centre of the Dundreggan forestry plan before travelling north following the route of the existing Beauly-Denny OHL to the proposed Bingally substation.

5.4.2 Route Option B contains two areas of Ancient Woodland. An area approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm substation and an area approximately and an area 1.2 km southwest of the proposed Bingally substation. Route Option B passes through five areas of Class 1, nationally important deep peat.

5.4.3 Route Option B avoids crossing through or near to the Glen Affric WLA, the WLA is, however, still in proximity (125 m west) of Route Option B.

5.4.4 Route Option B passes through the Tomchrasky wood forestry plan. Route Option B also passes through the centre of the Dundreggan forestry plan. The closest Scheduled Monument Balnacarn, township SM1142, is 600 m south of Route Option B.

5.4.5 The Tomich Village Conservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.4.6 The closest residential dwelling to Route Option B is 370 m southeast of Route Option B.

5.5 Route Option C

5.5.1 Route Option C is shown on **Figure 5-4, Appendix 1** and is approximately 16.2 km in length. Route Option C travels northeast from the proposed Tomchrasky Wind Farm substation through the centre of the Dundreggan forestry plan before travelling north to follow the route of the existing Beauly-Denny OHL to the proposed Bingally substation.

5.5.2 Route Option C avoids crossing the Glen Affric WLA, the WLA is however 125 m west of Route Option C therefore Route Option C is assigned an amber RAG rating the same as Route Options A and A1.

5.5.3 Route Option C passes two areas of Ancient Woodland, approximately 2.3 km north and an area approximately and an area 1.2 km southwest of the proposed Bingally substation. Route Option C passes through five area of Class 1, nationally important deep peat.

5.5.4 Route Option C passes the Tomchrasky wood forestry plan. Route Option C also passes through the centre of the Dundreggan forestry plan. The closest Scheduled Monument Balnacarn, township SM1142, is 600 m south of Route Options B. The closest Listed Building is equidistant to the northernmost extents of all route options at the proposed Bingally substation this is the Category C listed Achanagleish Cottage approximately 1.5 km northwest of the northernmost extents of all route options.

5.5.5 The Tomich Village Conservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.5.6 The closest residential dwelling to Route Option C is 370 m southeast of Route Option C.

5.6 Route Option D

5.6.1 Route Option D is shown on **Figure 5-5, Appendix 1** and is approximately 16.8 km in length, the longest of all route options. Route Option D travels northeast from the proposed Tomchrasky Wind Farm substation through the Dundreggan forest plan and continues northeast crossing the Beauly-Denny OHL in the south, before travelling back towards the proposed Bingally substation from the northeast of the area of search. Route Option D does not travel next to the existing Beauly-Denny OHL.

5.6.2 Route Option D is the furthest route option from The Glen Affric WLA therefore it is the least likely Route to compromise the setting or special qualities of the area.

5.6.3 Route Option D pass through a large continuous area of nationally important deep peat, therefore there is potential for Route Option D to compromise the integrity of GWTDEs.

5.6.4 Route Option D also contains one area of Ancient Woodland, an area approximately 2.3 km north of the proposed Bingally substation.

5.6.5 Route Option D passes through the Tomchrasky wood forestry plan. Route Option D also passes through the centre of the Dundreggan forestry plan.

5.6.6 The closest Listed Building is equidistant to the northernmost extents of all route options at the proposed Bingally substation this is the Category C listed Achanagleish Cottage approximately 1.5 km northwest.

5.6.7 The Tomich Village Conservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.6.8 The closest residential dwelling to Route Option D is 370 m southeast of Route Option D.

5.7 Route Option E

5.7.1 Route E is shown on **Figure 5-6, Appendix 1** and is approximately 13.9 km, the shortest of all the Route Options. Route Option E travels north from the proposed Tomchrasky Wind Farm substation through the envelope of the proposed Tomchrasky Wind Farm and directly through the Glen Affric WLA, before travelling northeast and crossing the existing Beauly-Denny OHL in the north immediately before the proposed Bingally substation. Route Option E does not travel next to the existing Beauly-Denny OHL.

5.7.2 Route Option E passes through areas of Class 1, nationally important deep peat, therefore there is potential for Route Option A1 to compromise the integrity of GWTDEs.

5.7.3 Route E also passes through a small area of the Glen Affric National Nature Reserve, and passes through two areas of Ancient Woodland, one area is 3.1 km southwest of the proposed Bingally substation and a second area 1.2 km southwest of the proposed Bingally substation.

5.7.4 Route Option E avoids contact with the Tomchrasky and Dundreggan commercial forestry plans, however, passes through a small area of commercial forestry land adjacent to the proposed Bingally substation.

5.7.5 The closest Scheduled Monument Balnacarn, township SM1142, is 2.3 km southeast of Route Options E.

5.7.6 The closest Listed Building is equidistant to the northernmost extents of all route options at the proposed Bingally substation this is the Category C listed Achanagleish Cottage approximately 1.5 km northwest of the northernmost extents of all route options.

5.7.7 The Tomich Village Conservation Area (CON23) is approximately 2.3 km north of the northern extents of all route options this area contains over 30 Category B and C listed buildings.

5.7.8 The closest residential dwelling to Route Option E is approximately 1.5 km southeast, this is the furthest route option from a residential dwelling.

6. ENVIRONMENTAL BASELINE

6.1 Baseline Conditions

6.1.1 A baseline desktop study has been carried out to identify a broad range of potential constraints and opportunities within the 1 km route options, and their adjacent context. This has involved the following activities:

- Identification of environmental designated sites and other constraints, utilising GIS datasets available via NatureScot's Site Link[3], Scotland's Environment Map[4], NatureScot's Open Data Hub[5], Historic Environment Scotland's Download Portal[6], Scottish Forestry Open Data[7] and data.gov.uk[8];
- Identification of archaeological designations and other recorded sites, utilising GIS datasets available via Historic Environment Scotland Data Services and Local Historic Environment Teams;
- Review of the Highland-wide Local Development Plan[9] to identify local policies and further environmental constraints and opportunities, such as Local Nature Conservation Sites (LNCS), Conservation Areas, core paths or other locations important to the public;
- Review of landscape character assessments of relevance to the Study Area;
- Review of Ordnance Survey (OS) mapping (1:50,000 and 1:25,000 and online GIS data sources from OS OpenData) and aerial photography (where available) to identify other potential constraints such as settlement, properties, walking routes, cycling routes etc.;
- Extrapolation of OS Vectormap GIS data to identify further environmental constraint including locations of watercourses and waterbodies, roads classifications and degree of slope; and
- Review of other local information through online and published media such as tourism sites and walking routes.

6.1.2 Desk-based studies were supplemented by a high-level and targeted walkover surveys by the project team to obtain further site data observations of localised constraints.

6.1.3 A summary of key environmental sensitivities and constraints present within the route options, or otherwise relevant to the route options, is set out below.

6.2 Environmental Designations

6.2.1 The following environmental designations are present within the Route Options Area:

- Glen Affric National Nature Reserve located in the northwest of the Route Options Area.
- Glen Affric WLA is located in the east of the Route Options Area.
- Glen Affric to Strathconon SPA is located approximately 2.5 km northwest of the proposed Bingally substation site. The SPA is designated for regularly supporting a population of European importance of the Annex 1 species, golden eagle *Aquila chrysaetos*.
- River Moriston SAC is located approximately 1.4 km south of the proposed Tomchrasky Wind Farm substation. The SAC is primarily designated for the presence of the Annex II species, freshwater pearl mussel

[3] NatureScot, 2023. *Site Link.* [Online]. Available at: https://sitelink.nature.scot/home [Accessed: July 2024].
[4] Scottish Environment Protection Agency, 2023. Scotland's Environment Map [Online]. Available at: https://map.environment.gov.scot/sewebmap/ [Accessed: July 2024].
[5] NatureScot, 2023. *NatureScot Open Data Hub* [Online]. Available at: https://opendata.nature.scot/ [Accessed: July 2024].
[6] Historic Environment Scotland, 2023. *Historic Environment Scotland's Download Portal* [Online]. Available at: https://portal.historicenvironment.scot/downloads [Accessed: July 2024].
[7] Scottish Forestry. (2024) *Scottish Forestry Map Viewer*. [Online] Available at: Scottish Forestry - Scottish Forestry Map Viewer [Accessed July 2024].
[8] UK Government, 2023. Find Open Data [Online]. Available at: https://www.data.gov.uk/ [Accessed: July 2024].
[9] Highland Council. *Highland wide Local Development Plan.* [Online]. Available at: https://www.highland.gov.uk/info/178/development_plans/199/highland-wide_local_development_plan [Accessed July 2024].

Margaritifera margaritifera. The presence of the Annex II species, Atlantic salmon *Salmo salar* is also a qualifying feature of the SAC.

6.2.2 Within the Route Options Area there are also several areas included on the Ancient Woodland Inventory (AWI), defined as land that has been continually wooded, at least since 1750. Although these areas of woodland are not afforded legal protection, there is a presumption against their removal in planning policy

6.3 Natural Heritage

6.3.1 In addition to the standard 1 km route, the following study areas have also been used for the review of the ecology baseline:

- 10 km for internationally or nationally designated sites (Special Protection Areas (SPAs), Special Areas of Conservation (SACs), and Wetlands of International Importance (Ramsar sites) and Sites of Special Scientific Interest (SSSIs), or further where possible connectivity exists (subject to professional judgement);
- 500 m for notable habitats, including areas of woodland listed in the Ancient Woodland Inventory (AWI)[10], areas with deep peat, and (where information is available) habitats of principal importance for the conservation of biodiversity listed in the Scottish Biodiversity List (SBL)[11]; and
- 500 m for records of protected and notable (including invasive) species.

International Designations

6.3.2 There are no internationally designated nature conservation sites located within any of the route options.

6.3.3 Glen Affric to Strathconon SPA is located approximately 2.5 km northwest of the proposed Bingally substation site. The SPA is designated for regularly supporting a population of European importance of the Annex 1 species, golden eagle *Aquila chrysaetos*.

6.3.4 Glen Affric to Strathconon SPA overlaps the eastern half of Strathglass Complex SAC which is located approximately 2.5 km northwest of the proposed Bingally substation at its closest point. There are 14 qualifying features associated with the Strathglass Complex SAC. The following Annex I habitats are present:

- 4010 Northern Atlantic wet heaths with *Erica tetralix;*
- 4060 Alpine and Boreal heaths;
- 4080 Sub-Arctic *Salix spp.* scrub;
- 6150 Siliceous alpine and boreal grasslands;
- 7130 Blanket Bogs;
- 8220 Siliceous rocky slopes with chasmophytic vegetation;
- 91C0 Caledonian forest;
- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the Isoëto-Nanojuncetea;
- 4030 European dry heaths;
- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels;

[10] NatureScot, 2023. *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. [Accessed: August 2024]
[11] NatureScot, 2020. *Scottish Biodiversity List*. [Online]. Available at: https://www.nature.scot/doc/scottish-biodiversity-list. [Accessed: August 2024]

- 8110 Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
- 8210 Calcareous rocky slopes with chasmophytic vegetation; and
- 91D0 Bog woodland.

Annex II species present as a qualifying feature include:

- 1355 Otter *Lutra Lutra*

6.3.5 River Moriston SAC is located approximately 1.4 km south of the proposed Tomchrasky Wind Farm substation. The SAC is primarily designated for the presence of the Annex II species, freshwater pearl mussel *Margaritifera margaritifera*. The presence of the Annex II species, Atlantic salmon *Salmo salar* is also a qualifying feature of the SAC.

National Designations

6.3.6 Several nationally protected areas are located within the boundary of Strathglass Complex SAC, including Affric – Cannich Hills SSSI, Glen Strathfarrar SSSI, Glen Affric SSSI, Liatrie Burn SSSI, and West Inverness-shire Lochs SSSI.

6.3.7 Glen Affric SSSI is the closest nationally designated site to the route option corridors and is located approximately 2.5 km northwest of the proposed Bingally substation. Glen Affric SSSI is designated due to the following features:

- Native pinewood;
- Breeding bird assemblage;
- Dragonfly assemblage; and
- Lichen assemblage.

6.3.8 The native pinewood is one of the largest in Scotland, predominantly north-facing, with a significant broadleaved element including birch, rowan, aspen, willows and alder. Its ecology is intermediate between western and eastern pinewoods, reflecting the climatic differences across the country. The woodland on the upper slopes and along Loch Affric is more open, with larger areas of dry and wet heath. Small pockets of bog woodland also occur within the site.

6.3.9 The diverse ground flora contains many of the species associated with native pinewoods such as creeping lady's tresses *Goodyera repens*, lesser twayblade *Listera cordata*, twinflower *Linnaea borealis* and four species of wintergreen. The bird assemblage includes several pinewood specialists such as crested tit *Lophophanes cristatus* and Scottish crossbill *Loxia scotica*. Capercaillie *Tetrao urogallus* are present in very low numbers and there is also a population of black grouse *Tetrao tetrix*. Glen Affric is outstanding for the lichen flora that grows on its trees, with a significant number of nationally rare or scarce lichens, including *Bryoria furcellata, B. capillaris* and *Calicium parvum*. The many lochs and bogs support a rich dragonfly community including the rare brilliant emerald *Somatochlora metallica*[12].

Ancient Woodland

6.3.10 The following route options contain areas of Ancient Woodland, as shown on **Figures 5-1** to **5-7, Appendix 1**:

- Route Option A (including an area approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm substation and an area approximately 1.2 km southwest of the proposed Bingally substation);

[12] Nature Scot (2024). *Glen Affric Site of Special Scientific Interest Site Management Statement*. [Online] Available at: Site_Management_Statement_697.pdf [Accessed: August 2024]

- Route Option A1 (including an area approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm Substation);
- Route Option B (an area approximately 2.3 km northeast of the proposed Tomchrasky Wind Farm substation and an area approximately 1.2 km southwest of the proposed Bingally substation);
- Route Option C (an area approximately 2.3 km north and an area approximately 1.2 km southwest of the proposed Bingally substation);
- Route Option D (an area approximately 2.3 km north of the proposed Tomchrasky Wind Farm substation); and
- Route Option E (two areas approximately 1.2 km and 3.1 km southwest of the proposed Bingally substation).

National Nature Reserves

6.3.11 Glen Affric National Nature Reserve is located approximately 1.1 km southwest of the proposed Bingally substation and is partially located within Route Options A, B, C and E.

European Protected Species

6.3.12 Commercially available recent records of European Protected Species (EPS) natterer's bat *Myotis nattereri* (also listed on the Scottish Biodiversity List (SBL)) were identified within a 2 km buffer of the route options on the National Biodiversity Network (NBN) Atlas Scotland[13].

6.3.13 All route options (with the exception of Route Option E) have recent records of otter *Lutra lutra*, within the 2 km study area. Route E however crosses small watercourses which may be used by otter.

Species Protected under the Wildlife and Countryside Act

6.3.14 Commercially available recent records of species protected under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) several species were identified within a 2 km buffer of the route options on NBN Atlas Scotland. All Route Options showed records of pine martin *Martes martes* (also listed on SBL), and red squirrel *Sciurus vulgaris* (also listed on SBL). Common frog *Rana temporaria* were also identified (considered a protected animal). The fugus species; lungwort *Lobaria pulmonaria* (also listed on SBL) was also identified within the 2 km buffer of all route options.

6.3.15 The north of all route options also cross an area of known water vole *Arvicola terrestris* (also listed on SBL) distribution as identified by the National Water Vole Distribution & Mapping Project[14].

6.3.16 All route options also cross areas of known common lizard *Zootoca vivipara,* adder *Vipera berus* and slow-worm *Anguis fragilis* (also all listed on SBL) distribution as identified by the Record Pool project for herpetofauna data collection[15].

Other Protected and Notable Species

6.3.17 Based on commercially available recent records of species listed on the SBL, several species of animalia and fungi were identified within a 2 km buffer of the route options on NBN Atlas Scotland. The lichen subspecies *Rhizocarpon amphibium* (categorised as Data Deficient) and *Cladonia uncialis* (categorised as Near Threatened)

[13] NBN Atlas. (2024) *UK Biodiversity Records Hub.* [Online] Available at: NBN Atlas - UK's largest collection of biodiversity information [Accessed August 2024].
[14] The Wildlife Trust *The National Water Vole Database & Mapping Project* [Online] Available at: The National Water Vole Database & Mapping Project | The Wildlife Trusts [Accessed September 2024].
[15] Amphibian and Reptile Conservation and Amphibian and Reptile Groups of the UK *Record Pool* [Online] Available at: Welcome to the Record Pool] [Accessed September 2024].

were identified on the ICUN Red List.[16] *Rhizocarpon amphibium* is considered nationally rare while *Cladonia uncialis* is considered nationally scarce.

Habitats

6.3.18 All route options are cross areas of Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Such areas are likely to be of high conservation value (as identified in the Carbon and Peatland 2016 Map[17]). Based on the Carbon and Peatland map. The distribution of Class 1 peat across the route options is as follows and shown on **Figure 5-7, Appendix 1**:

- At five points within Route Option A;
- At five points within Route Option A1;
- At five points with Route Option B;
- At five points within Route Option C;
- At three points within Route Option D. Route Option D also passes through the largest continuous area of Class 1 peat; and
- At five points within Route Option E. Route Option E passes through the largest total area of Class 1 peat.

6.3.19 The presence of Class 1 peat indicates that Groundwater Dependant Terrestrial Ecosystems (GWDTEs) are a potential environmental constraint for all routes.

6.3.20 The route options all cross areas of raised and/or blanket bogs. Blanket bog is a protected Annex I habitat and is included in the UK Biodiversity Action Plan (UKBAP) as a priority habitat.

6.3.21 In the north, at the entry to the proposed Bingally substation, all six route options cross through a habitat mix of Scots Pine woodland and Mesic grassland. The primary habitats which all 1 km route corridors pass through are raised and blanket bogs with small intervening pockets of temperate shrub heathland and arctic, alpine and subalpine scrub.

Ornithology

Designations

6.3.22 Corrimony Royal Society for Protection of Birds (RSPB) Reserve is located approximately 9km northeast of the proposed Bingally substation.

6.3.23 As stated in **Section 4.3.1**, Glen Affric SSSI approximately 4.8 km west of the proposed Bingally substation is designated due to the presence of breeding bird assemblage. The assemblage includes several pinewood specialists such as crested tit *Lophophanes cristatus* and Scottish crossbill *Loxia scotica*. Capercaillie *Tetrao urogallus* are present in very low numbers and there is also a population of black grouse *Tetrao tetrix.*

Schedule 1 Birds

6.3.24 Glen Affric to Strathconon SPA is located approximately 2.5 km southwest of the proposed Bingally substation site. Glen Affric to Strathconon is designated due to regularly supporting a population of European importance, the Annex I species golden eagle, *Aquila chrysaetos* which is also listed as a Schedule 1 Species under the Wildlife and Countryside Act 1981.

[16] ICUN (2014) *ICUN Red List of Threatened Species* [Online] Available at: IUCN Red List of Threatened Species [Accessed September 2024]

[17] NatureScot (2016) *Carbon and Peatland 2016 Map*. [Online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10 [Accessed: August 2024]

Notable Bird Species

6.3.25 There are commercially available recent records for 14 notable bird species within the Study Area on NBN Atlas Scotland. These include five species listed on Annex I of the EC Birds Directive[18], one species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)[19], six species listed on the SBL, and two species on the Birds of Conservation Concern 5 (BoCC5) Red list[20].

6.3.26 All wild birds, their nests and eggs are protected by law. Of these species, given the nature of the landscape, those which may breed along the route corridors, include the skylark *Alauda arvensis*, barn owl *Tyto alba,* golden plover *Pluvialis apricaria*, red grouse *Lagopus lagopus,* and dunlin *Calidris alpina*. The last three (all ground nesting) may nest on the rocky moorland plateau and rugged massifs crossed by all route options.

6.3.27 Red grouse, golden plover and dunlin were only identified within proximity of Route Option D, however, all route options cross land which could be suitable breeding grounds. Barn owl, which is a specially protected Schedule 1 species, mainly nests in suitable rural buildings and farm outbuildings. The skylark could nest in suitable areas of short grass and agricultural fields of the farmed straths located in the north of the Area of Study and crossed by Route Options A, B and C.

6.4 Geology, Hydrology and Hydrogeology

Designations

6.4.1 There are no geological designations within any of the route options. However, Coire Dho Geological Conservation Review Site is located approximately 3.5 km west of the proposed Tomchrasky Wind Farm substation.

Peat and Soil

6.4.2 All route options cross areas of Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Such areas are likely to be of high conservation value (as identified in the Carbon and Peatland 2016 Map[21]). Based on the Carbon and Peatland map. The distribution of Class 1 peat across the route options is as follows:

- At five points within Route Option A.
- At five points within Route Option A1.
- At five points with Route B.
- At five points within Route Option C.
- At three points within Route Option D. Route Option D also crosses through the largest continuous area of Class 1 peat.
- At five points within Route Option E. Route Option E crosses through the largest total area of Class 1 peat.

Hydrology and Hydrogeology

[18] Publications Office of the European Union (2019) *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds*. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147 [Accessed July 2024].
[19] *Wildlife and Countryside Act 1981 (as amended), c.69*. [Online] Available at https://www.legislation.gov.uk/ukpga/1981/69/contents [Accessed July 2024].
[20] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win, I. (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, pp 723-747.
[22] SEPA (2015) Water Classification Hub. [Online] https://www.sepa.org.uk/data-visualisation/water-classification-hub/ [Accessed August 2024].

6.4.3 There are a number of surface watercourses located within all six of the route options[22]. Travelling north from the proposed Tomchrasky Wind Farm substation to the proposed Bingally substation, these include:

- Allt na Muic (Good Condition);
- Allt Baile nan Carn (Moderate Condition);
- Allt Bhlaraidh (Bad Condition);
- Allt Larairidh (Good Condition); and
- River Enrick – headwaters (Moderate Condition).

6.4.4 All six route options are located within the Northern Highlands groundwater body (SEPA ID 150701), which has an overall status of Good as of 2022.

6.4.5 All six route options are located within a Class 2C aquifer, in which flow is virtually all through fractures and other discontinuities, small amounts of groundwater in near surface weathered zone and secondary fractures.

6.4.6 All six route options fall within the Northern Highlands Drinking Water Protection Area (DWPA).

6.5 Cultural Heritage

Designations

6.5.1 There are no Scheduled Monuments within the 1 km route options. The closest Scheduled Monument to any Route Option is 'Balnacarn, township' (SM11482), which is 600 m south of Route Option B. This comprises the remains of a township dating to the 18th, 19th and early 20th centuries. It survives as a series of low stone footings, dykes and clearance cairns and is situated in rough pasture across the lower slopes of Glenmoriston, at around 75 m above sea level. The Scheduled Monument is located 2.7 km east of the proposed Tomchrasky Wind Farm substation.

6.5.2 Additionally, 'Fort Augustus-Bernera Military Road' (SM11484) is located approximately 2.5 km southwest of the proposed Tomchrasky Wind Farm substation and comprises of a stretch of mid-18th-century military road approximately 6 km long and 5.3 m in width which now survives as a grass and heather covered track.

Other Site and Monument Record Entries

6.5.3 There are several non-designated asset records found within all six route options including shieling huts, a cairnfield, and a prehistoric hut circle.[23]

Cultural Heritage Assets

6.5.4 There are no listed buildings within any of the route options. Tomich Village Conservation Area (CON23) is approximately 2.4 km north of the proposed Bingally substation and contains over 30 Category B and C listed buildings. The closest listing building to the Route Options is the Category B listed 'Tomich, Guisachan, former stables' (LB8125), approximately 1.2 km northwest from the northernmost extents of the Route Option A1 and 1.7 km northwest of the proposed Bingally substation.

[22] SEPA (2015) Water Classification Hub. [Online] https://www.sepa.org.uk/data-visualisation/water-classification-hub/ [Accessed August 2024].
[23] CANMORE. (2024) *National Record of the Historic Environment.* [Online] Available at: https://canmore.org.uk/site/search/result?view=map&layer=airborne [Accessed August 2024].

6.6 People

Proximity to Dwellings

6.6.1 No settlements are present within the route options. In the south of the study area, an individual residential dwelling part of the village of Tomchrasky lies approximately 420 m south of Route Option B and 1.8 km southeast of the proposed Tomchrasky Wind Farm substation. The village of Dalchreichart is approximately 1.2 km south of Route Option B and 3.5 km east of the proposed Tomchrasky Wind Farm substation.

6.6.2 In the north of the study area, the village of Tomich is approximately 2.4 km north of the proposed Bingally substation, and the northern extents of all route options. The larger settlements of Fort Augustus and Glenmoriston are over 10 km from the closest 1 km Route Option (Route Option C).

6.7 Landscape and Visual

Designated and Protected Landscapes

National Designations

National Scenic Areas (NSAs)

6.7.1 The Glen Affric WLA envelopes the Glen Affric NSA. The Glenn Affric NSA is located approximately 7.1 km north of the proposed Tomchrasky Wind Farm substation and approximately 3.8 km northwest of the closest 1km Route Option (Route Option E).

Wild Land Areas (WLAs)

6.7.2 The Glen Affric WLA is located approximately 2.2 km north of the proposed Tomchrasky Wind Farm substation. Although not a designation, these are given protection within the Planning System through Scottish Planning Policy (SPP)., and the midsection of Route Option E passes through the southeastern extents of the WLA. Route Options A and A1 pass adjacent to the southern boundary of the WLA. The Glen Affric WLA is defined by NatureScot as being *"comprised of a mix of large mountains, peatland and glens, reflecting the underlying geology of predominantly Moine schists, later carved during glaciation. The area wraps around a series of glens that run west – east, including: Killian; Strath Croe; Strathconon; Orrin; Glen Strathfarrar; Glen Cannich; and Glen Affric. Being so extensive, it also includes the watershed dividing west and east flowing rivers, with views from some mountain tops to both coasts. The area is largely uninhabited and used mainly for deer stalking and fishing. However, there are some isolated estate lodges, cottages and stock grazing within some of the glens, as well as hydro-electric reservoirs and forest plantations around the margins. Many people view the WLA from outside its edges, including along the A890, A887 and A87 main roads and the Dingwall to Kyle railway."*[24]

Landscape Character

6.7.3 The landscape character of the area of search is largely rural in nature and sparely inhabited and is strongly influenced by the existing Beauly-Denny line which is present between the proposed Tomchrasky Wind Farm substation and the proposed Bingally substation. Core path IN05.03 travels north towards the proposed Fasnakyle substation parallel to the Beauly-Denny line.

[24] Nature Scot. (2017) *Description of Wild Land Area.* [Online] Available at: Wild land Description Central-Highlands-July-2016-24.pdf [Accessed July 2024].

Landscape Character Types

6.7.4 The route options cross a total of four distinct Landscape Character Types (LCT) as defined by the digital map-based national Landscape Character Assessment published by NatureScot (2019)[25] (see **Figure 5-8, Appendix 1)**. A summary of the LCTs present and which routes cross which LCTs is shown in **Table 6.1**.

Table 6-1 Landscape Character Types

Landscape Character Type (LCT)	Description	Routes crossing the LCT
LCT 220 – Rugged Massif	The Rugged Massif – Inverness Landscape Character Type consists of rugged, exposed mountains which cover much of the north-western part of Inverness district, on the north side of the Great Glen, and extending beyond the district boundary northwards into Ross-shire. This type tends to be divided into distinct hill ranges by the long east-west glens of the Wooded Glen Landscape Character Type[26].	Proposed Tomchrasky Wind Farm substation located within LCT 220. All route options cross LCT 220.
LCT 222 – Rocky Moorland Plateau Inverness	The Rocky Moorland Plateau - Inverness Landscape Character Type consists of two areas of high rocky plateau which covers much of the central part of the district, gradually merging to the Rugged Massif - Inverness in the west and bordering the Great Glen to the east. The plateaux form a simple moorland backdrop to the adjacent lower straths and glens. Extensive conifer forests occur in the north-east of this Landscape Character Type. Rocky Moorland Plateau often acts as a buffer between areas of greater land use intensity[27].	Proposed Bingally substation located within LCT 227. All route options cross LCT 222.
LCT 226 – Wooded Glen Inverness	The Wooded Glen - Inverness Landscape Character Type consists of wooded and farmed glens to the west of Loch Ness, namely Glen Moriston, Glen Affric, Glen Cannich, Glen Strathfarrar and Glen Urquhart. The glens are broad at their lower end where they pass through Rocky Moorland Plateau - Inverness. In their upper	The following route options cross LCT 226: Route Option A Route Option A1 Route Option B Route Option C

[25] NatureScot, (2019) *Scottish Landscape Character Types Map and Description - LCT 17 Coastal Agricultural Plain – Aberdeenshire.* [Online]. Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions [Accessed: July 2024]

[26] Nature Scot (2019). *Landscape Character Type 220 Rugged Massif Inverness.* [Online] Available at: LCT 220 - Rugged Massif - Inverness - Final pdf.pdf (nature.scot) [Accessed: July 2024].

[27] Nature Scot (2019). *Landscape Character Type 222 Rocky Moorland Inverness*. [Online] Available at: LCT 222 - Rocky Moorland Plateau - Inverness - Final pdf.pdf (nature.scot) [Accessed: July 2024].

Landscape Character Type (LCT)	Description	Routes crossing the LCT
	reaches they are relatively narrow and less intensively managed, and located within Rugged Massif - Inverness[28]	Route Option D
LCT 227 – Farmed Strath Inverness	The Farmed Strath - Inverness Landscape Character Type occurs in two locations – at Strathnairn/ Stratherrick and Strathglass – where it forms a linear to sinuous channel through the surrounding upland landscape. The straths run south-west to north-east and open to the farmed and wooded slopes and plains around Inverness. The straths are characterised by mainly open farmed valley floors and a central meandering river contained within steep, mainly forested and wooded slopes. Strathglass is narrower, more enclosed and less settled than Strathnairn[29].	The following route options cross LCT 227: Route Option A Route Option B Route Option C

Visual Receptors

Views from Built Properties

6.7.5 There are no settlements or dwellings within any of the six route options. The main residential receptors are limited to a small cluster of residential and farmstead properties which line the River Moriston within the settlements of Tomchrasky and Dalchreichart. Properties appear to be predominantly south facing. Additional residential receptors include the town of Tomich in the north of the Study Area, located approximately 2.3 km north of the proposed Bingally substation.

6.7.6 Existing OHLs associated with the existing Beauly-Denny line, and other electrical infrastructure are likely existing features of the views from many properties. Forestry and the local topography of the area provide screening opportunities for these properties.

Views from Roads and Public Transport

6.7.7 There are no public roads within the route options. The nearest public roads are a network of unnamed minor roads which connect the residential properties to the A877 link road, this network is approximately 650 m south of Route Option B and 2.1 km southeast of the proposed Tomchrasky Wind Farm substation. The A877 is the nearest major road and is approximately 1.5 km south of the proposed Tomchrasky Wind Farm substation, connecting Bun Loyne in the West to Invermoriston in the east where it joins the A82. The A831 is located approximately 7.5 km northeast of the proposed Bingally substation.

[28] Nature Scot (2019). *Landscape Character Type 226 Wooded Glen Inverness*. [Online] Available at: LCT 226 - Wooded Glen - Inverness - Final pdf.pdf [Accessed July 2024].

[29] Nature Scot (2019). *Landscape Character Type 227 Farmed Strath Inverness*. [Online] Available at: LCT 226 - Wooded Glen - Inverness - Final pdf.pdf [Accessed July 2024].

6.7.8 Existing OHLs associated with the existing Beauly-Denny line and other electrical infrastructure are likely existing features of the views from roads within the area. Extensive areas of forestry and the topography of the area around these properties provide opportunities for screening.

Views from Recreational Routes

There are no long-distance recreational routes within or in close proximity to the 1 km route corridors. The closest long-distance recreational route is the Glen Affric Way which is approximately 11 km southeast of the proposed Bingally substation.

Core path IN05.03 is located within several of the 1km route options. This core path is located through the midsection of Route Options A, A1, B and C, where these route options run parallel to the existing Beauly-Denny OHL at this location. The same core path is located within Route Option D where it crosses the Beauly-Denny OHL, and within Route Option E where it crosses the Beauly-Denny OHL to enter the proposed Bingally substation.

6.8 Land Use

Forestry

6.8.1 All route options pass close to a small area of clear-felled commercial forestry in the north adjacent to the proposed Bingally substation.

6.8.2 In the south, approximately 460m southwest of the proposed Tomchrasky Wind Farm substation, the following Routes Options cross an area in the north of the Tomchrasky Wood in the south. Tomchrasky Wood is an area previously subject to clear-felling which was due for restock in June 2022:

- Route Option A
- Route Option A1
- Route Option B
- Route Option C
- Route Option D

6.8.3 The Dundreggan Forest Plan is located within the following route options, where licenses for thinning and clear felling exist:

- Route Options A and A1 are located within a small area in the north of the Dundreggan Forest Plan.
- Route Option B is located through the centre of the Dundreggan Forest Plan.
- Route Option C is located through the centre of the Dundreggan Forest Plan.
- Route Option D is located through the centre of the Dundreggan Forest Plan.

Agriculture

6.8.4 All route options are located on land which is predominantly Class 6.3 land according to the Scottish Government Land Capability for Agriculture (LCA). Class 6.3 land comprises land capable of use as rough grazing with low quality plants (see **Figure 5-9, Appendix 1**).

6.8.5 Route Options A, B and C are also partially located on a very small area of Class 5.3 land in the north approximately 750 m southwest of the proposed Bingally substation. Class 5.3 land comprises land capable of use as improved grassland where pasture deteriorates quickly (see **Figure 5-9, Appendix 1**).

Recreation

Points and Routes of Recreational Interest

6.8.6 Core Path IN 05.03 is located in the northern extent of all route options and runs parallel to the existing Beauly-Denny.

7. COMPARATIVE ANALYSIS

7.1.1 This section provides a summary of the comparison of potential environmental, technical and economic constraints across all route options. Reference should be made to **Figures 4.1 to 5.9, Appendix 1**. Summary RAG Tables for each constraint type are provided at the end of each section.

Environmental Topic Areas

7.1 Natural Heritage

Designations

7.1.1 The Glen Affric NNR is located within Route Options A, B C and E. Only Route Option A1 and D avoid intersecting the Glen Affric NNR. The Glen Affric NNR, which is designated for the presence of several protected species including pine martens, otters and golden eagles as well as the presence of native woodland may therefore pose a potential constraint to Route Options A, B, C and E.

7.1.2 Areas of ancient woodland are present within all route options but are generally of small scale. Route Option A and E contain the largest areas of ancient woodland. However, for the most part there would be opportunities to minimise interaction with ancient woodland for all route options.

7.1.3 There are no further designated natural heritage sites within the Route Options Area. The closest internationally designated natural heritage site is the River Moriston SAC, designated for Atlantic salmon *salmo salar* and freshwater pearl mussel, *margaritifera margaritifera* approximately 620 m south of the southernmost extents of Route Options A – D. Route Option E is the furthest route option from the River Moriston SAC approximately 1.42 km north. The northernmost extents of all route options are approximately 2.40 km south of the Glen Affric to Strathconon SPA. Due to the relative distance constraints for all route options are considered unlikely.

Protected Species

7.1.4 All route options pass through a mix of habitats with the potential to support protected species. All route options pass through, to varying degrees, a mix of woodland and / or open moorland habitats that could support protected species such as bat, badger, pine marten and red squirrel, and would cross a number of watercourses that could support otter and water vole. The potential for constraint at this stage across all route options is comparable. Minimising effects on habitats of importance to protected species will need to be reviewed during the alignment selection stage.

Habitats

7.1.5 There is evidence of Annex 1 habitats present across all route options.

7.1.6 In the north at the entry to the proposed Bingally substation the route options all cross through a habitat mix of Scots Pine woodland and Mesic grassland. The primary habitats which all route options pass through are raised and blanket bogs with small intervening pockets of temperate shrub heathland and arctic, alpine and subalpine scrub.

Ornithology

7.1.7 All route options potentially constrained due to the presence of birds within the Route Option Study Area. Though presence/absence of species is not known at this stage, suitable habitats are present in all route options to support

sensitive bird species. Corrimony Royal Society for Protection of Birds (RSPB) Reserve is located approximately 9km northeast of the northernmost extents of all route options.

7.1.8 Glen Affric SSSI approximately 4.83 km west of the northernmost extents of all route options is designated due to the presence of breeding bird assemblage. The assemblage includes several pinewood specialists such as crested tit *Lophophanes cristatus* and Scottish crossbill *Loxia scotica*. Capercaillie *Tetrao urogallus* are present in very low numbers and there is also a population of black grouse *Tetrao tetrix*.

7.1.9 Glen Affric to Strathconon is also designated due to regularly supporting a population of European importance, the Annex I species golden eagle, *Aquila chrysaetos* which is also listed as a Schedule 1 Species under the Wildlife and Countryside Act 1981.

7.1.10 There are commercially available recent records for 14 notable bird species within the Study Area on NBN Atlas Scotland. These include five species listed on Annex I of the EC Birds Directive, one species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) , six species listed on the SBL, and two species on the Birds of Conservation Concern 5 (BoCC5) Red list.

7.1.11 Red grouse golden plover and dunlin were only identified within proximity of Route Option D, however all route options cross land which could be suitable breeding grounds. Areas crossed by Route Options A, A1 B and C include short grasses and agricultural fields located in the north of Route Options Area which present suitable breeding grounds for skylark.

Geology, Hydrology and Hydrogeology

7.1.12 Priority peatland mapping[17] highlights that all route options pass through areas of Class 1 and 2 peatlands. Route Option D passes through the largest area of Class 1 peat.

7.2 Cultural Heritage

Cultural Heritage Designations

7.2.1 There are no cultural heritage designations within any route options.

The closest Scheduled Monument ‘Balnacarn, township’ SM1142, is over 1 km south of Route Options A, A1 and E compared to 600 m south of Route Options B, C and D. Environmental constraints associated the physical asset itself are unlikely for all route options however there is less likelihood of constraints relating to setting for Route Option A1 as a result.

Cultural Heritage Assets

7.2.2 There are no listed buildings within any of the route options. Tomich Village Conservation Area (CON23) is approximately 2.4 km north of the proposed Bingally substation and contains over 30 Category B and C listed buildings. The closest listing building any route option is the Category B listed ‘Tomich, Guisachan, former stables’ (LB8125), approximately 1.2 km northwest from the northernmost extents of all route options.

7.3 People

Proximity to Dwellings

7.3.1 There are no residential properties or buildings present within any of the route options. The closest route option to a residential dwelling is Route Option B, which is located approximately 420 m south of a single residential dwelling. For all route options there are opportunities to avoid close proximity to this residential dwelling.

7.4 Landscape and Visual

Landscape Character

7.4.1 Route Option A, B and C cross through 4 LCTs. Route Option A1 and D pass through three LCTs and Route E passes through two different LCTs. Route Options A, B and C are therefore more likely to be constrained due to cross boundary impacts on the landscape.

Designations

7.4.2 Route Option E passes directly through the centre of the Glen Affric WLA, this route option is most likely to be constrained by the WLA. Route Option A and A1 pass adjacent to the boundary of the Glen Affric WLA, Route Option B and C pass approximately 125m east of the Glen Affric WLA.WLAs are identified as nationally important in Scottish Planning Policy.

7.5 Land Use

Agriculture

7.5.1 All route options are located on land which is predominantly Class 6.3, land capable for use as rough grazing with low quality plants. Route Options A, B and C are also partially located on a very small area of Class 5.3 land in the north approximately 750m southwest of the proposed Bingally substation. Class 5.3 land comprises land capable of use improved grassland where pasture deteriorates quickly

Forestry

7.5.2 All route options pass close to a small area of clear-felled and stocked commercial forestry land in the north adjacent to the proposed Bingally substation.

7.5.3 In the south of the Route Option Study Area, approximately 460 m southwest of the proposed Tomchrasky Wind Farm substation, Route Options A-D cross through the Tomchrasky Wood commercial forestry area.

7.5.4 The Dundreggan forest plan is also located within the Route Option Study Area. Route Options B, C and D cut through the centre of the Dundreggan forest, whereas Route Options A and A1 only pass through small areas in the west and north.

7.5.5 Significant effects on commercial forestry are therefore most likely with Route Options B, C and D, as these route options pass through the largest areas of commercial forestry.

Recreation

7.5.6 Constraints on recreational interests are focused on the trails and walking routes. Route Options A – C which follow the same route as Core-path (IN 05.03). Route Options D and E avoid interaction with core paths. However, Route Option E also passes through the centre of the Glen Affric WLA which is a popular destination for walkers.

7.6 Environmental Topic Areas RAG Summary

7.6.1 Route Option E passes through the centre of the Glen Affric WLA and therefore is the most likely of the route options to be constrained by landscape and visual designations. Route Options A and A1 pass next to the southern boundary of the WLA and Routes B, C and D all pass approximately 100 m from the boundary of the WLA.

7.6.2 Route Options B, C and D are most likely to be constrained by commercial forestry operations as they each pass through the centre of the Tomchrasky and Dundreggan forestry plans. Route Options A and A1 are less likely to be constrained as they only pass through a small area of both forestry plans. Route Options E avoids both forestry plans.

7.6.3 Route Options A and B pass through one small area of Glen Affric National Nature Reserve and Route E passes through two small areas of the Glen Affric NNA. Route Options A1 and D avoid passing through the Glen Affric NNA. Therefore, Routes A, B and E are more likely to be constrained by natural heritage designations compared to Routes A1 and D.

Table 7-1 Environmental Topic Areas RAG Summary

Category	Route Option A	Route Option A1	Route Option B	Route Option C	Route Option D	Route Option E
Natural Heritage						
Designations	H	M	H	H	M	H
Protected Species	M	M	M	M	M	M
Habitats	M	M	M	M	M	M
Ornithology	M	M	M	M	M	M
Geology, Hydrology and Hydrogeology	M	M	M	M	M	M
Cultural Heritage						
Designations	L	L	L	L	L	L
Cultural Heritage Assets	L	L	L	L	L	L
People						
Proximity to Dwellings	L	L	L	L	L	L
Landscape and Visual						
Designations	M	M	M	M	M	H
Landscape Character	M	M	M	M	M	M
Visual	M	M	M	M	M	M
Land use						
Agriculture	L	L	L	L	L	L
Forestry	H	H	H	H	H	H
Recreation	M	M	M	M	M	M
Planning						
Policy	M	M	M	M	M	M
Proposals	M	M	M	M	M	M
Totals	**Route Option A**	**Route Option A1**	**Route Option B**	**Route Option C**	**Route Option D**	**Route Option E**
L	4	4	4	4	4	4
M	10	11	10	10	11	9
H	2	1	2	2	1	3

Technical Topic Areas

7.7 Infrastructure Crossing

Major Crossings

7.7.1 Major crossings include other OHLs of 132 kV and above, railways, rivers/loch 200 m+, navigable waterways, motorways and other major roads, major pipelines and other significant infrastructure. These crossing require specific OHL solutions and can greatly constrain a design.

7.7.2 All route options will require a single crossing of the existing 400 kV Beauly-Denny OHL. The line consists of steel lattice towers carrying two circuits: a 275 kV circuit and a 400 kV circuit. Extending over 137 km, it plays a key role in transmitting renewable energy from northern Scotland to the south. Therefore, all options have been scored similarly as the only major crossing required is under the existing 400 kV line between Fasnakyle and Fort Augustus. No other major crossings were identified on all the information sourced for this assessment.

Road Crossings

7.7.3 Road crossings include all road crossing excluding those considered under major crossings. Private tracks and driveways may also be included where the need for access to be maintained is present or where relatively high traffic volumes are anticipated. Whilst the impact on OHL design is less for these crossings, measures are still required and collectively they can greatly constrain an Option.

7.7.4 A few minor access roads are available across all options assessed. There is a track that runs in parallel with the 400 kV OHL from Fasnakyle to Fort Augustus which will need to be crossed by all options.

7.7.5 At Balnacarn there is an access track running north which will be crossed by Route Options A1, A, B, C and D. This same road also provides access to the proposed Tomchrasky Wind farm location.

7.7.6 For Route Option E only one crossing to the haul road was identified. This option has the least amount of accessibility as no other roads/ tracks are present for the remaining of the route options.

7.8 Environmental Design

7.8.1 The terrain, land features and atmosphere all have the potential to constrain the design of an OHL. In particular the ease and safety of routeing, construction and maintenance can all be impacted. Furthermore, the environment can impose long term risk from pollution and flooding. Route options with multiple or significant environmental features have a large risk of constraint in the routeing. Impacts on the environment from the OHL are considered outside this document and are not included in this section.

Elevation

7.8.2 High elevations increase wind and ice loading on the lines resulting in the need for shorter spans or stronger structures. This can constrain Route options and increase cost. Additionally, access for construction and maintenance tends to be more difficult at altitude and the risk of severe weather is greater.

7.8.3 All options traverse to significantly high elevations which will affects loadings on the OHL due to wind conditions.

7.8.4 All route options exceed the 200 m AOD referenced in PR-OF-NET-ENV-501, categorizing them as high risk.

7.8.5 Route Options A1, D and E have the highest average elevations, surpassing 400 m AOD, making these options the least favourable compared to the others.

7.8.6 Alignments within these high-risk options would be difficult to score positively due to the amount of high-altitude areas they will need to go through.

Atmospheric Pollution

The atmospheric pollution has been checked based from the data gather from National Atmospheric Emission Inventory (NAEI)[30]. The NAEI provides information on the following pollutants that are deemed to affect the performance of OHL:

- Carbon dioxide;
- Nitrogen Dioxide;
- Nitrogen Oxide;
- Sulphur Dioxide; and
- Particulate matters (10 um, 2.5 um, 1 um & 0.1 um).

All options have similar atmospheric emissions along the length of the route options, with little or no variation between options. All options have been assigned a low risk as current emission levels are relatively low and therefore do not pose a risk to the performance of the Proposed Development.

Contaminated Land

7.8.7 Contaminated land poses a significant health risk to construction and maintenance operatives, and is potentially expensive to mitigate, dispose of or remediate. As such, the presence of contaminated land in a route option would be a significant constraint. For assessment purposes, the presence of unexploded ordnance, is also considered in this section as it has similar implications.

7.8.8 No known areas of contaminated land or evidence of a risk of contaminated land was identified in the assessment.

Flooding

7.8.9 Areas vulnerable to flooding pose a potential risk during construction, may prevent maintenance and can pose a physical risk to structures during flood events. As such, route options with large areas vulnerable to flooding would have a high risk of constraint.

7.8.10 Using the SEPA flood map, all options go through similar quantities of high-risk flood zone areas, impacting all of them in a similar way. All percentages are below 2% of the total area of the route options proposal, therefore all options have been scored as low risk impact due to flooding.

7.9 Ground Conditions

Terrain

Steep or mountainous slopes present a significant difficulty for routeing, access, construction and maintenance. Options with a large proportion of steep or mountainous slopes are more likely to be constrained and thus more difficult and costly to build and maintain.

[30] NAEI (2022) *UK Emissions Interactive Map* [Online] Available at: https://naei.beis.gov.uk/emissionsapp/ [Accessed: January 2025]

Route Option A

7.9.1 Route Option A has gradients that range from 10 to 63 degrees, however the majority of Route Option A ranges between 0 and 30 degrees. The areas with a steep gradient are not sizeable and although these is one area where there is a potential pinch point, it is located to the east of Route Option A and the existing haulage roads sit to the west which is the alignment the pole route would take. There are in the region of six minor water crossings within Route Option A and one area of standing water, none of which would cause any concerns in regard to crossing them. There are areas with class 1 and 2 peat within the Route Option A.

Route Option A1

7.9.2 Route Option A1 has gradients that range from 10 to 63 degrees, however the majority of Route Option A1 ranges between 0 and 30 degrees. The areas with a steep gradient are not sizeable and although these is one area where there is a potential pinch point, it is located to the east of Route Option A1 and the existing haulage roads sit to the west which is the alignment the pole route would take. There are in the region of six minor water crossings within Route Option A1 and one area of standing water, none of which would cause any concerns in regard to crossing them. There are areas with class 1 and 2 peat within the Route Option A1.

Route Option B

7.9.3 Route Option B has a similar number of gradients to Route Option A, that range from 10 to 63 degrees. However, the majority of Route Option B ranges between 0 and 30 degrees. The areas with a steep gradient are not sizeable and although these is one area where there is a potential pinch point, it is located to the east of Route Option B and the existing haulage roads sit to the west which is the alignment the pole route would take. There are in the region of seven minor water crossings within Route Option B , none of which would cause any concerns in regard to crossing them. The lower part of Route Option B heading west to the wind farm runs through/ near commercial forestry. There are areas with class 1 and 2 peat within the Route Option B.

Route Option C

7.9.4 Route Option C has a similar number of gradients to Route Option A that range from 10 to 63 degrees. However, the majority of Route Option C ranges between 0 and 30 degrees. The areas with a steep gradient are not sizeable and although these is one area where there is a potential pinch point, it is located to the east of Route Option C and the existing haulage roads sit to the west which is the alignment the pole route would take. There are in the region of seven minor water crossings within Route Option C , none of which would cause any concerns in regard to crossing them. The lower part of Route Option C heading west to the Wind farm runs through/near commercial forestry. There are areas with class 1 and 2 peat within Route Option C.

Route Option D

7.9.5 The initial section of Route Option D is running south from the proposed Bingally Substation is level in regard to gradient, however this soon changes with steep gradients running across the whole Route Option D for a significant part of Route Option D which would make identifying a pole alignment difficult and would also create issues in relation to access for the install and maintenance. There are in the region of eight minor water crossings within Route Option D, none of which would cause any concerns in regard to crossing them. There are also areas of unbroken class 1 and 2 peat within Route Option D

Route Option E

7.9.6 Route Option E has slightly more gradients than the other route options. There are at least three significant pinch points along Route Option E where degree in gradient increases significantly across Route Option E. This would

increase the difficulty of aligning the pole route and in relation to access for install and maintenance. There are in the region of 10 minor water crossings within Route Option E , none of which would cause any concerns in regard to crossing them. There are two water courses located within the route option one is more significant in size than those on the other routes. The are areas with class 1 and 2 peat within Route Option E.

7.9.7 Overall, the route options are not flat, with some areas having slopes exceeding 50%. However, Route Options A, B, and C have possible alignments that can avoid these steep areas. Each route option includes at least one narrow pinch point.

Peat

7.9.8 Peat, particularly deep peat, represents a significant difficulty for access, construction and maintenance. Route options with a large proportion peatland are more likely to be constrained and thus more difficult and costly to build and maintain. Peatland is also an important habitat and construction of new OHLs can cause lasting damage.

7.9.9 The NatureScot website[31] has been used to determine peat areas along each route option.

7.9.10 All route options go through significant amounts of peat as can be seen below. Some publicly available information was sourced regarding the peat depth identified in these areas. **Figure 5.7 Appendix 1** shows this information in relation the route options.

7.9.11 It is expected that all route options will need to have peat management due to the size of peat identified in all route options. Therefore, all route options are assigned a Red RAG rating.

7.10 Construction and Maintenance

Access

7.10.1 Construction of temporary access for construction are a significant project cost and a route option that is remote from existing tracks and the public road network has the potential to incur large access costs. Furthermore, access for inspection and maintenance is necessary throughout the life of the asset. A route option remote from existing access routes represents a significant risk and has a high potential to be constrained.

7.10.2 Route Options A1, A, B, and C provide the best accessibility to the proposed route. As they have good accessibility through the haul road for the Beauly Denny 400 kV OHL and via the access road that connects to Tomchrasky road south of the new wind farm proposal.

All route options traverse through a very remote area with no social dwellings or interactions with any monuments or particular tourist attraction which makes all route options to be Low Risk. Therefore, all route options are assigned a Green rating.

[31] Scotland's Soils (2016). *Carbon and peatland 2016 map.* [Online] Available at: Carbon and peatland 2016 map | Scotland's soils [Accessed: January 2025]

7.11 Proximity

Clearance Distance

7.11.1 Dispersed buildings and properties are a common feature of the Scottish landscape. Placing OHLs in close proximity to these features is rarely well received and best avoided. Route options with numerous areas in close proximity to buildings and properties have significant risk of constraining routing.

Windfarms

7.11.2 Windfarms pose a risk to OHLs due to disruption of airflows and need to be routed around. Sections of the proposed OHL may be required to be undergrounded if they fall within 3 x rotor diameter of an adjacent wind turbine structure (the 'wake zone', in accordance with current design requirements. The planning application for the proposed Tomchrasky Wind Farm identifies that the turbines have a hub height of 114 m and rotor diameter of 71 m.. It is considered the wake zone can be avoided by the proposed development. . All route options pass through the proposed area for the Fasnakyle Wind Farm, which surrounds the proposed location for Bingally substation. A scoping document was submitted for the Wind Farm in 2019, outlining a proposed 44 turbine wind farm.

Route Option A

7.11.3 The section of Route Option A out of Tomchrasky substation has potential to be within 3 x rotor distance from turbines 6, 11 and 12. However, it may be possible to avoid this within the Route Option A boundary when planning the alignment. There is also, potential to skirt around boundary of the proposed Fasnakyle Wind Farm.

Route Option A1

7.11.4 The section of Route Option A1 out of Tomchrasky substation has potential to be within 3 x rotor distance from turbines 6, 11 and 12. However, it may be possible to avoid this within the Route Option A1 boundary when planning the alignment. A 3.8 km of Route Option A1 passes through the proposed Fasnakyle Wind Farm.

Route Option B

7.11.5 The section of Route Option B out of Tomchrasky substation has potential to be within 3 x rotor distance from turbines 6, 11 and 12. However, it may be possible to avoid this within the Route Option B boundary when planning the alignment. There is also potential to skirt around boundary of the proposed Fasnakyle Wind Farm.

Route Option C

The section of Route Option C out of Tomchrasky substation has potential to be within 3 x rotor distance from turbines 6, 11 and 12. However, it may be possible to avoid this within the Route Option C boundary when planning the alignment. There is also potential to skirt around boundary of the proposed Fasnakyle Wind Farm.

Route Option D

7.11.6 The section of Route Option D out of Tomchrasky substation has potential to be within 3 x rotor distance from turbines 6, 11 and 12. However, it may be possible to avoid this within the Route Option D boundary when planning the alignment. A 2 km section of Route Option D passes through the proposed Fasnakyle Wind Farm.

Route Option E

Route Option E travels through the proposed Tomchrasky Wind Farm with encroachment of 3 x rotor diameter to turbines 4, 5, 10, 11, 12, 14. The wind turbine 3 x rotor diameter areas overlap each other, so it would not be

possible to avoid them with this option at alignment stage. This route option is therefore considered the worst option in this category. A 2 km section of Route Option E passes through the proposed Fasnakyle Wind Farm, however, there is potential to skirt around boundary.

Communication Masts

7.11.7 OHLs can block existing line of sights for telecommunication masts and thus the line of sights from mast can constrain structure locations.

7.11.8 The OS map and cell mapper website[32] have been assessed to check if any communication masts are present near the Route options. No communication masts are located within any of the route options therefore they are all assigned a Green RAG Rating.

Urban Developments

7.11.9 As with dispersed buildings and properties, urban areas represent a significant constraint that will often need to be routed around.

7.11.10 All route options, windfarm and substations are located more than 3 km away from the nearest urban development in the north at Tomich, and around 2 km away from Tomchrasky in the south. No other buildings were found between the two substation locations.

Metallic Pipes

7.11.11 Metallic pipes have to be both avoided by individual supports, as they are often expensive to reroute, and, ideally, the final alignment should avoid running parallel, to avoid electrical impacts on the pipelines. As such it represents a constraint on routeing options.

7.12 Engineering Topic Areas RAG Summary

7.12.1 Route Option A stands out as the most balanced and pragmatic choice when evaluated qualitatively against the other options. Below are the key reasons why Route Option A is preferred:

Minimal High-Risk Areas

7.12.2 Route Option A has only three high-risk (H) areas, tied for the lowest among all options alongside Route Options B and C. However, it performs better overall due to its fewer intermediate (M) and a higher number of low-risk (L) factors compared to these alternatives.

7.12.3 Key high-risk concerns like peatland, windfarms, and elevation are shared across all options, making Route Option A's performance in these areas comparable to others, but its strengths in other areas make it preferable.

Superior Ground Condition and Access

7.12.4 Unlike Route Options A1, D, and E, which have high-risk terrain or access challenges, Route Option A maintains a manageable intermediate (M) level for terrain and a low (L) risk for access. This makes it more viable for construction and maintenance.

[32] Call Mapper UK (2024). [Online] Available at: https://www.cellmapper.net/ [Accessed: January 2025]

Environmental and Infrastructure Considerations

7.12.5 Option A performs strongly with low-risk (L) ratings for atmospheric pollution, contaminated land, flooding, and minor roads, demonstrating its minimal environmental impact and lower infrastructural complexity.

Other route options, particularly Route Options D and E, have higher risks in flooding or access issues, further increasing complexity and cost.

Proximity and Other Considerations

7.12.6 Route Option A has low-risk (L) ratings across key proximity concerns like clearance distance, communication masts, urban developments, and metallic pipes, ensuring fewer constraints in design and operation.

7.12.7 While Route Option E also performs well in these areas, it introduces significant risks in other categories like access and windfarms.

Balanced Intermediate Risks

7.12.8 With only four intermediate (M) areas, Route Option A maintains a balanced approach, outperforming Route Option C, which has five intermediate (M) risks, and Route Option A1, which has fewer intermediates (M) but one additional high-risk concern.

Better Trade-Offs in Route Option Length

7.12.9 While Route Option E offers the lowest route length (L), it comes at the cost of higher risks in other critical areas such as access. Route Option A's intermediate risk here is a reasonable compromise that avoids significant trade-offs elsewhere.

Table 7-2 Technical Topic Areas RAG Summary

Category	Route Option A	Route Option A1	Route Option B	Route Option C	Route Option D	Route Option E
Infrastructure Crossing						
Major Crossings	M	M	M	M	M	M
Minor Roads	M	M	M	M	L	L
Environmental Design						
Elevation	H	H	H	H	H	H
Atmospheric Pollution	L	L	L	L	L	L
Contaminated Land	L	L	L	L	L	L
Flooding	L	L	L	L	M	L
Ground Condition						
Terrain	M	H	M	M	H	H
Peat	H	H	H	H	H	H
Construction and Maintenance						
Access	L	L	L	L	M	H
Proximity						
Clearance Distance	L	L	L	L	L	L
Windfarms	H	H	H	H	H	H

Category	Route Option A	Route Option A1	Route Option B	Route Option C	Route Option D	Route Option E
Communication Masts	L	L	L	L	L	L
Urban Developments	L	L	L	L	L	L
Metallic Pipes	L	L	L	L	L	L
Totals	**Route Option A**	**Route Option A1**	**Route Option B**	**Route Option C**	**Route Option D**	**Route Option E**
L	8	8	8	8	7	8
M	3	2	3	3	3	1
H	3	4	3	3	4	5

Cost Topic Areas

7.12.10 Cost assessment has been based on the same technology option (steel H pole) for all route options, considering the route option and length – this primarily affects the construction and land assembly costs.

7.12.11 Diversions and public road improvement works are considered the same for all options as all will require same equipment and access needs.

7.12.12 Costs associated with felling are based on the Environmental assessment of impacts to felling – cost increases would reflect requirements for compensation payments plus the costs associated with any compensatory planting and operational/maintenance costs.

Table 7-3 Cost Topic Areas Table for Route Options

Category	Route Option A	Route Option A1	Route Option B	Route Option C	Route Option D	Route Option E
Economic (Capital)						
Construction	M	L	L	L	M	L
Diversion	L	L	L	L	L	L
Public Road	L	L	L	L	L	L
Felling	M	M	H	H	H	M
Land Assembly	M	L	L	L	M	L
Totals	**Route Option A**	**Route Option A1**	**Route Option B**	**Route Option C**	**Route Option D**	**Route Option E**
L	2	4	4	4	2	4
M	3	1	0	0	2	1
H	0	0	1	1	1	0

7.13 Cost Topic Areas RAG Summary

7.13.1 The Cost Topic Areas RAG assessment summarises the costs of each of the six route options by the following categories; Construction, Diversion, Public Road, Felling, and Land Assembly. As per the above RAG

assessment table, the following results are sorted in most cost effective to least cost effective; Route Option B, Route Option C, Route Option A1, Route Option E, Route Option A, Route Option D.

8. SUMMARY AND NEXT STEPS

8.1.1 SSEN Transmission is required to provide a connection for the proposed Tomchrasky Wind Farm to the existing transmission network at the proposed Bingally substation. The proposed connection would comprise a new 132 kV OHL supported by steel trident pole structures.

8.1.2 This Consultation Document summarises the environmental, technical and economic (cost) appraisal of the route options considered.

8.1.3 Comments are sought from stakeholders on the route options considered. When providing your comments and feedback, SSEN Transmission would be grateful for your consideration of the questions below:

- Have we adequately explained the need for the connection of the Tomchrasky Wind Farm?
- Do you feel enough information has been provided to understand what is being proposed and why?
- Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?
- Do you have any particular concerns or queries on the proposed connection from Tomchrasky Wind Farm to Bingally substation?

8.2 Next Steps

8.2.1 All comments on the route options and route selection process are requested by 21st February 2025. Following the consultation events and a review of consultation responses, a Report on Consultation will be produced which will document the consultation responses received, and the decisions made in light of these responses to inform the selection of a proposed route.

8.2.2 Following the identification and confirmation of a proposed route, further technical and environmental surveys will be undertaken to identify alignment options, after which further consultation will be carried out.

APPENDIX 1: FIGURES

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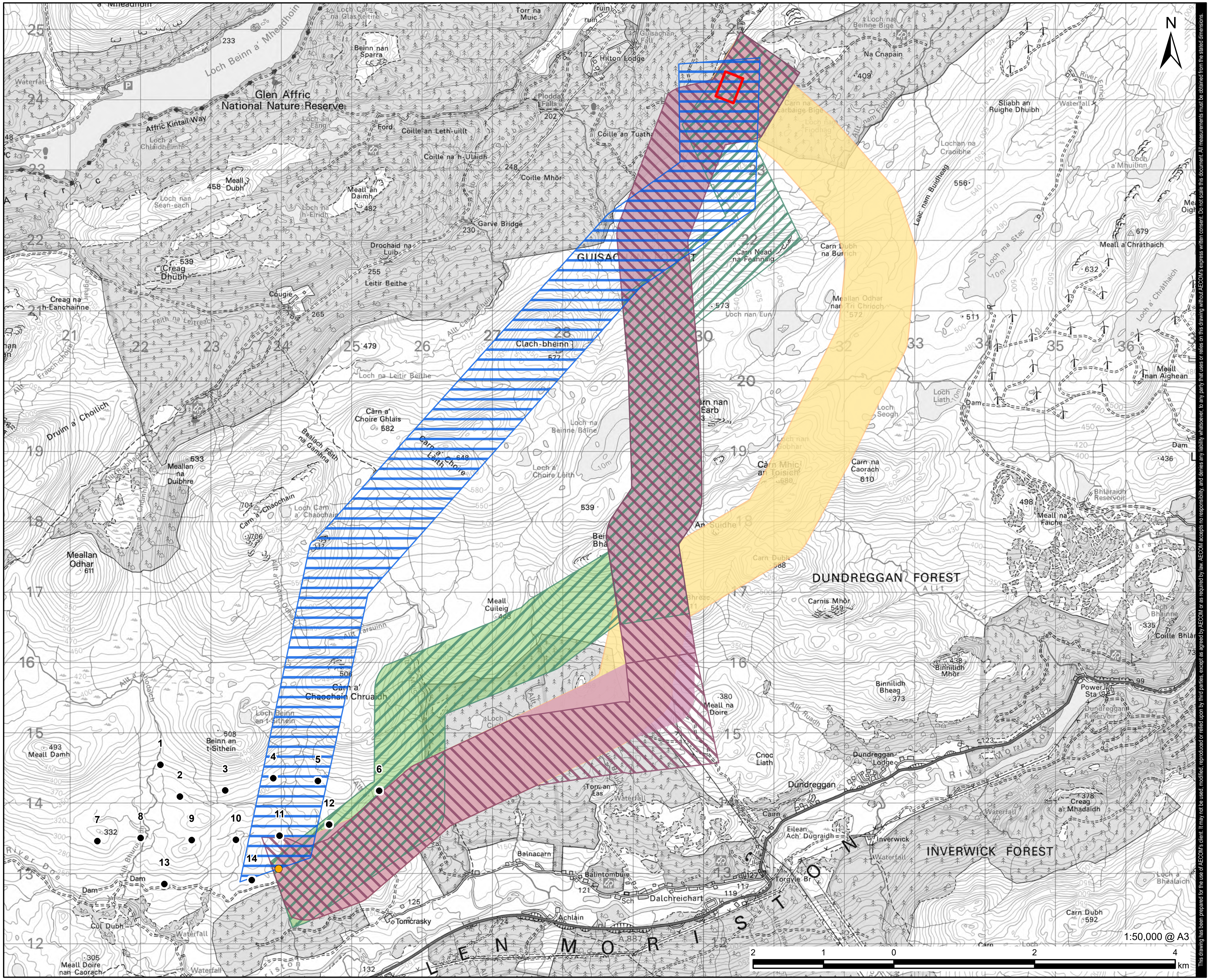

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Scottish and Southern Electricity Networks

CONSULTANT

AECOM Limited
Aldgate Tower
2, Leman Street
London, E1 8FA
United Kingdom

LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation

Route Options

- Route A
- Route A1
- Route B
- Route C
- Route D
- Route E

NOTES

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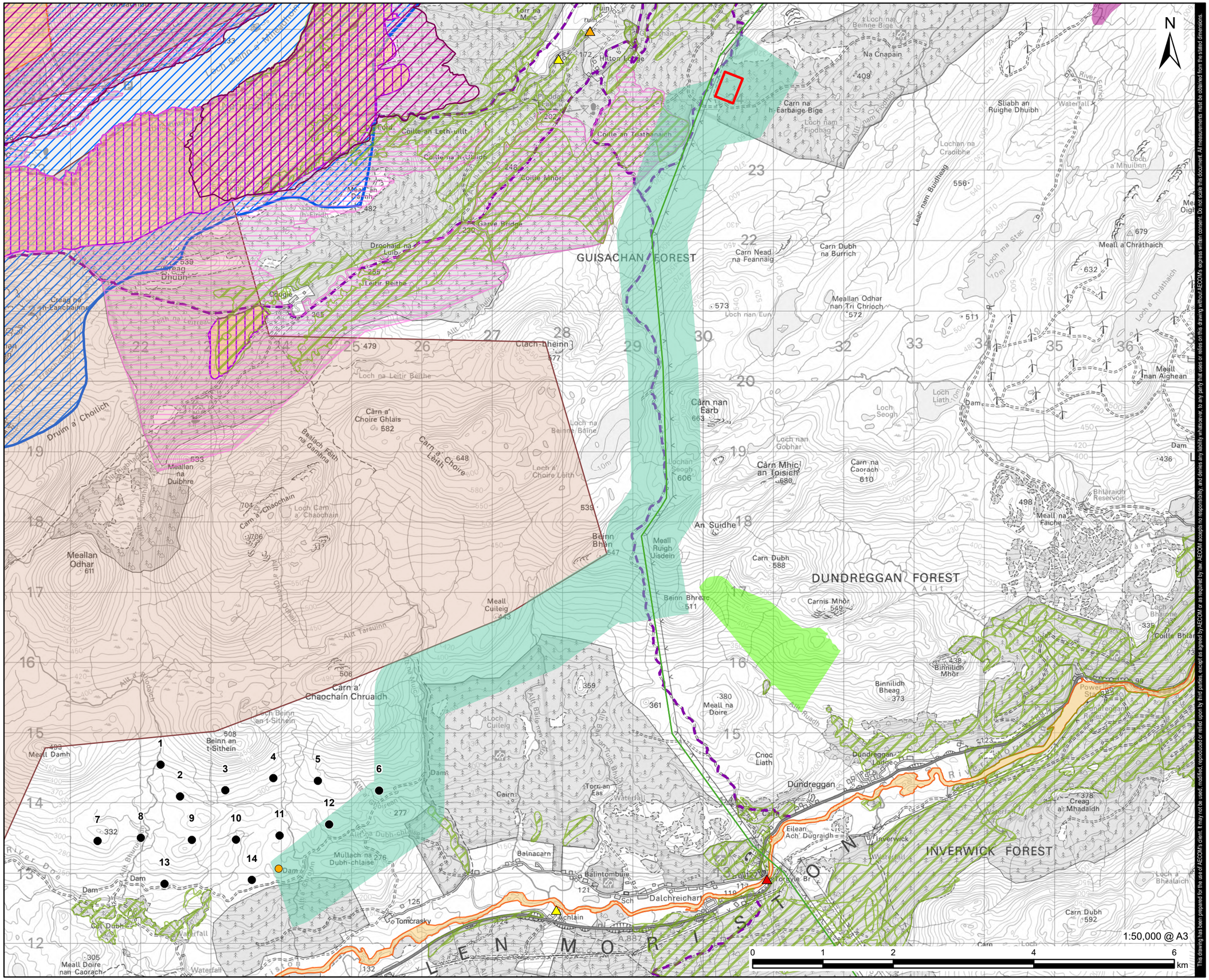
FIGURE TITLE

Route Options Plan

FIGURE NUMBER

Figure 4 - 1



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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route A
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

NOTES

ISSUE PURPOSE

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FIGURE TITLE

Environmental Constraints
Route Option A

FIGURE NUMBER

Figure 5 - 1

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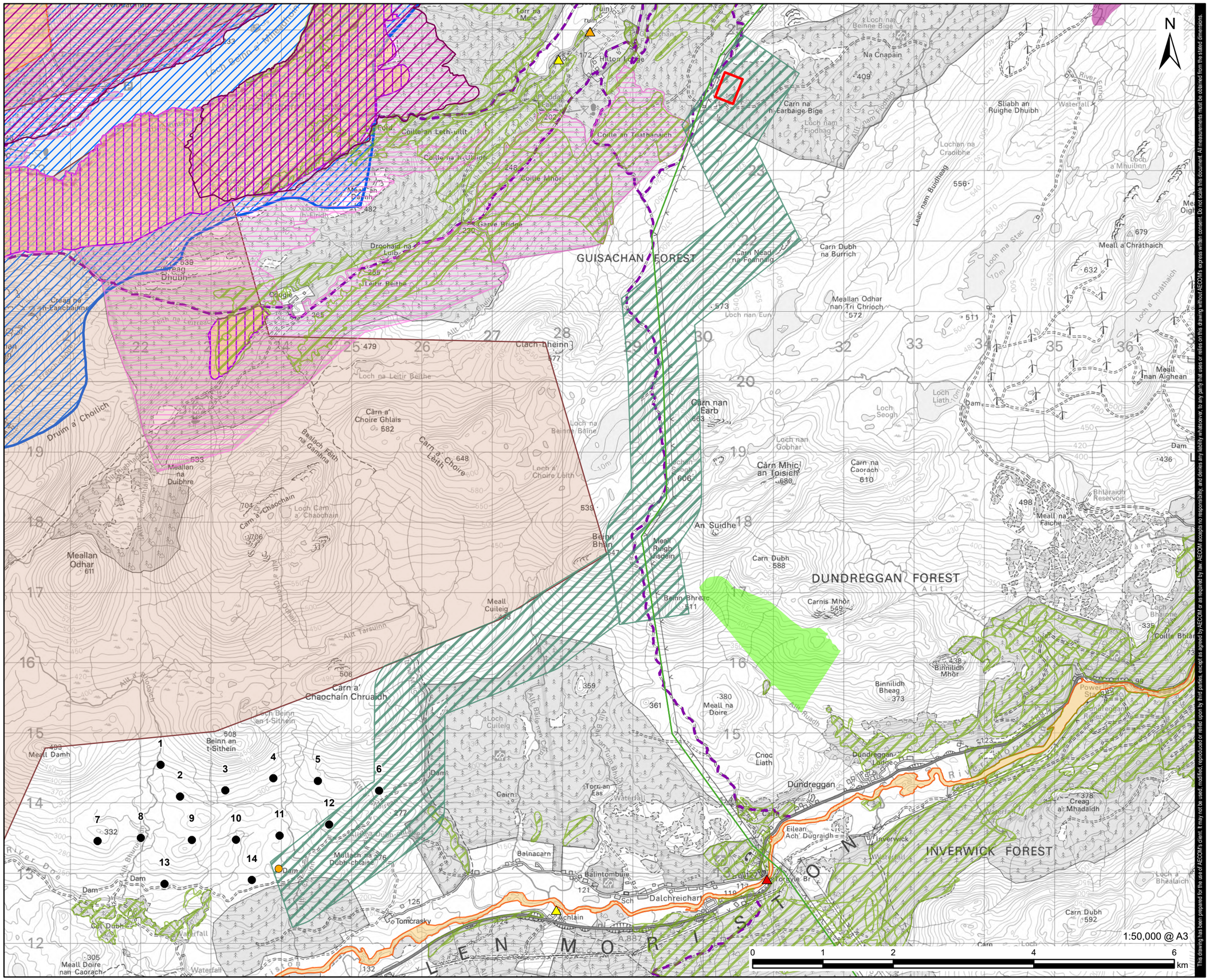

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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route A1
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

NOTES

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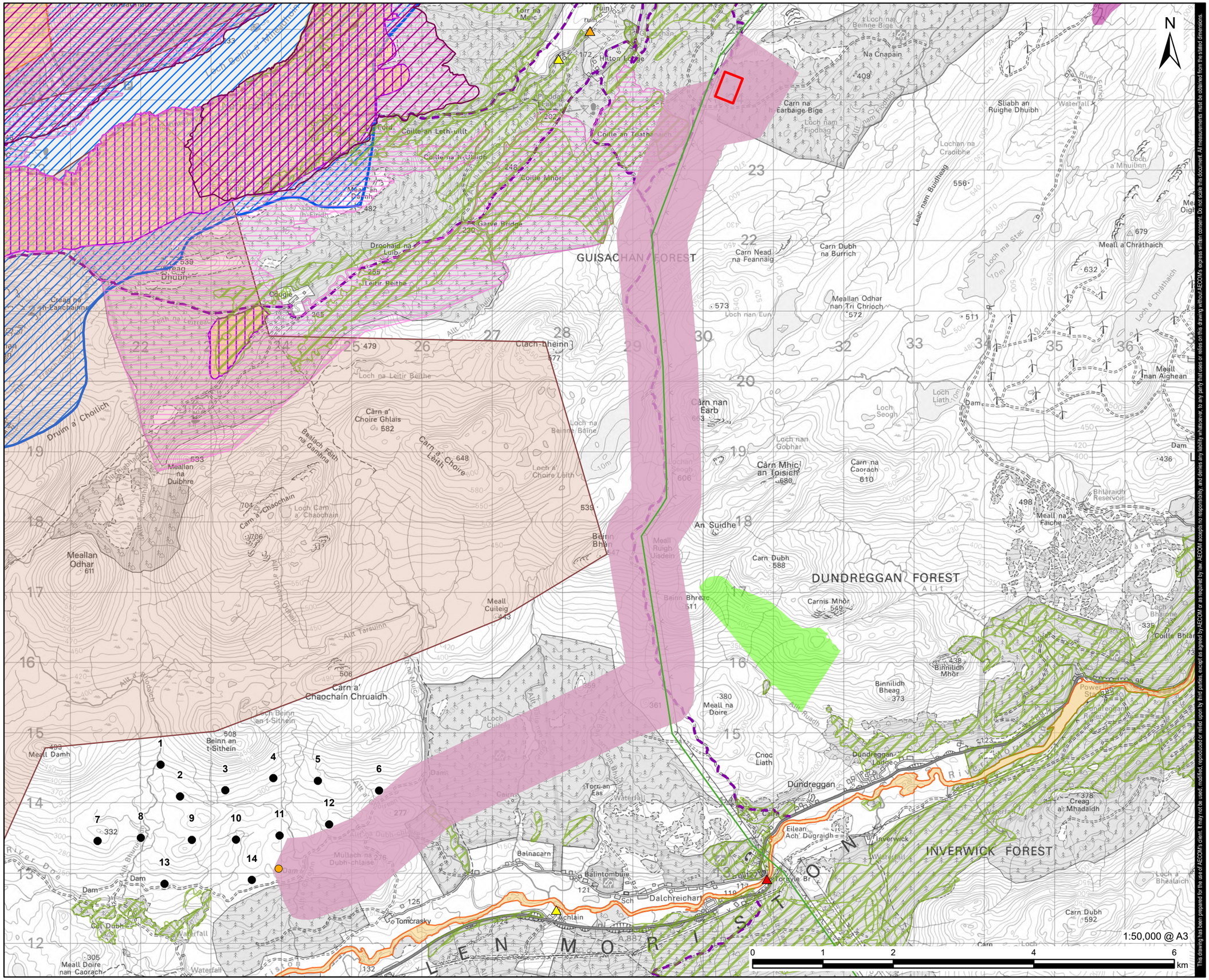
60719623

FIGURE TITLE

Environmental Constraints
Route Option A1

FIGURE NUMBER

Figure 5 - 2



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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route B
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

NOTES

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PROJECT NUMBER

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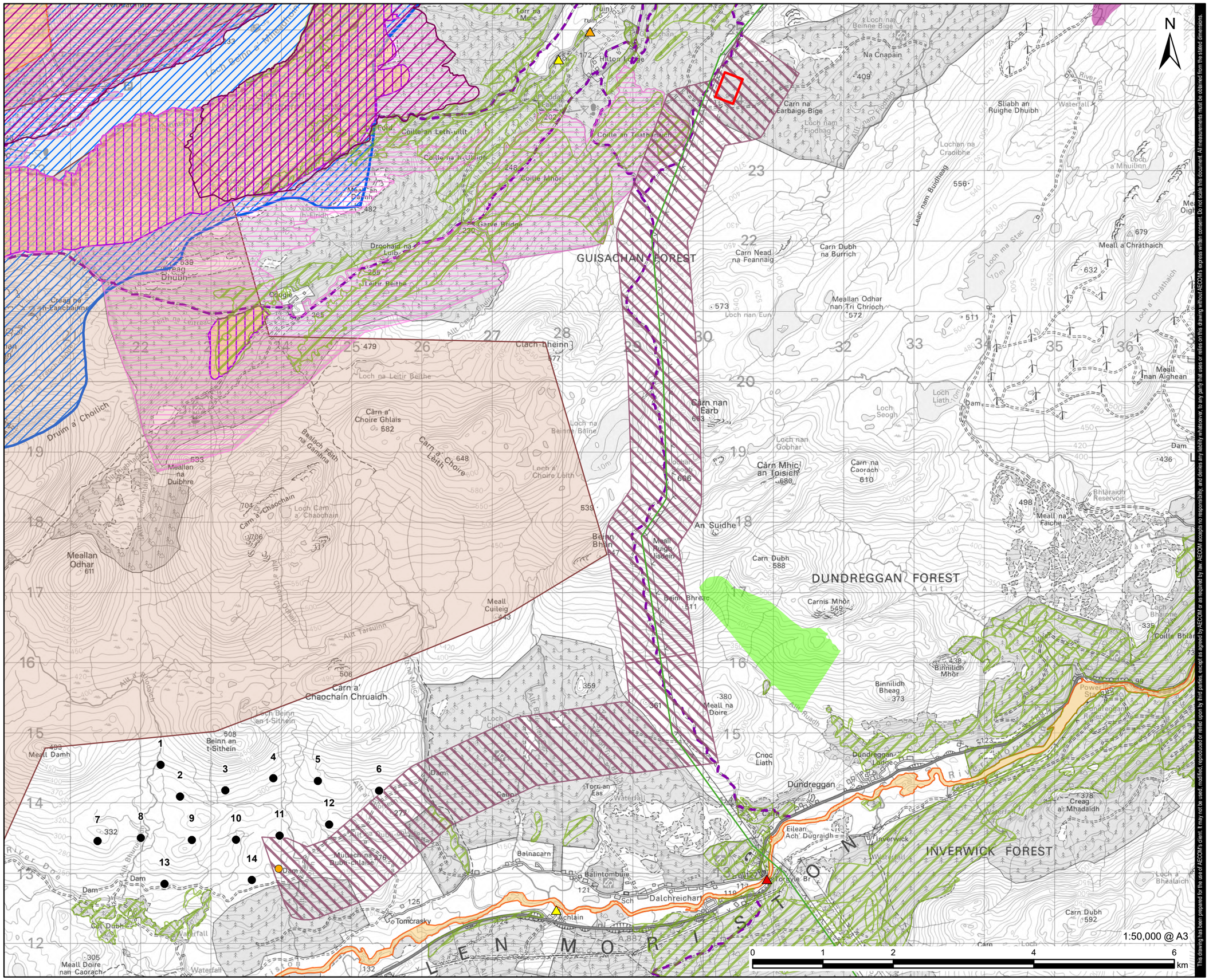
FIGURE TITLE

Environmental Constraints
Route Option B

FIGURE NUMBER

Figure 5 - 3



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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route C
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

NOTES

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FIGURE TITLE

Environmental Constraints
Route Option C

FIGURE NUMBER

Figure 5 - 4

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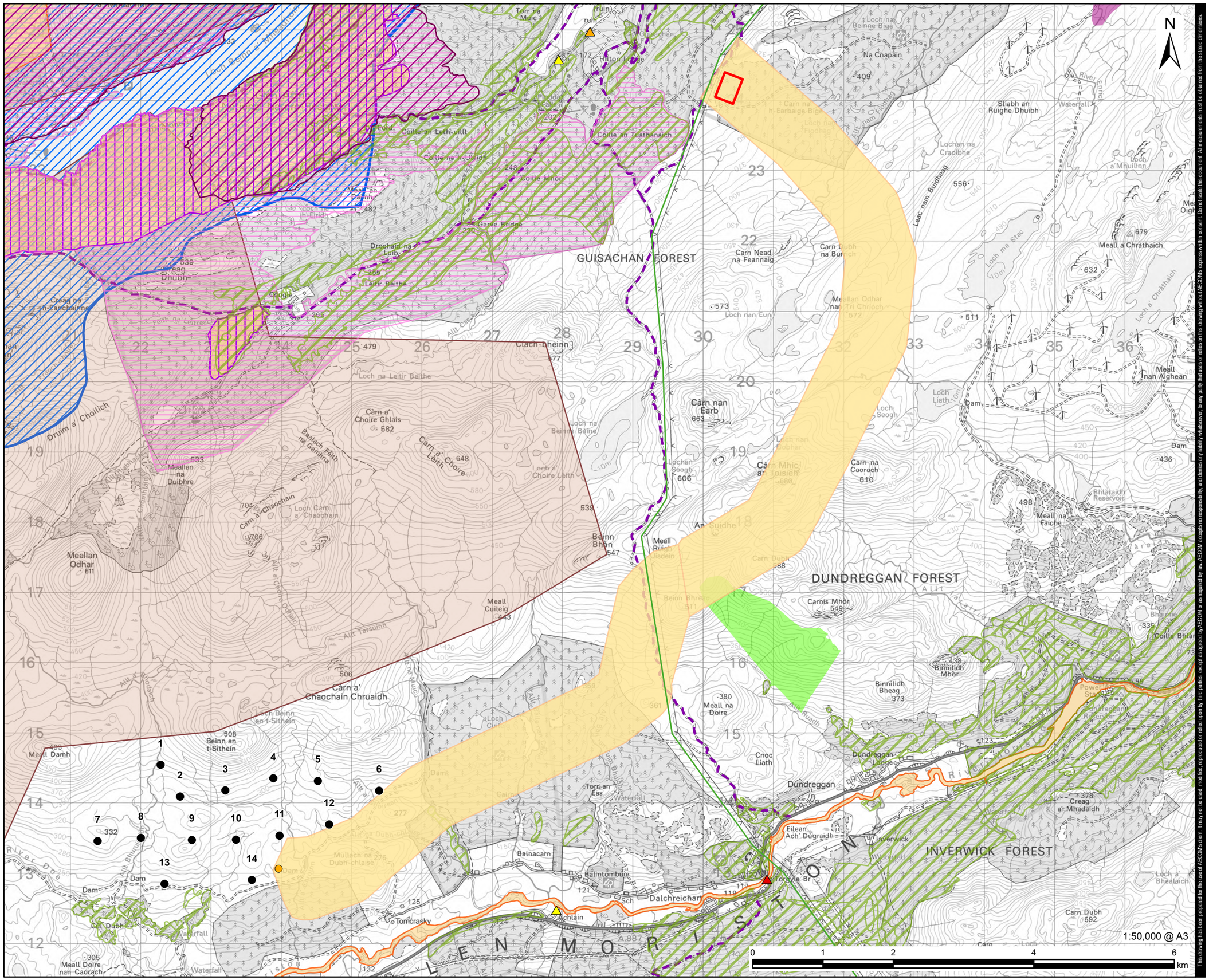

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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route D
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

NOTES

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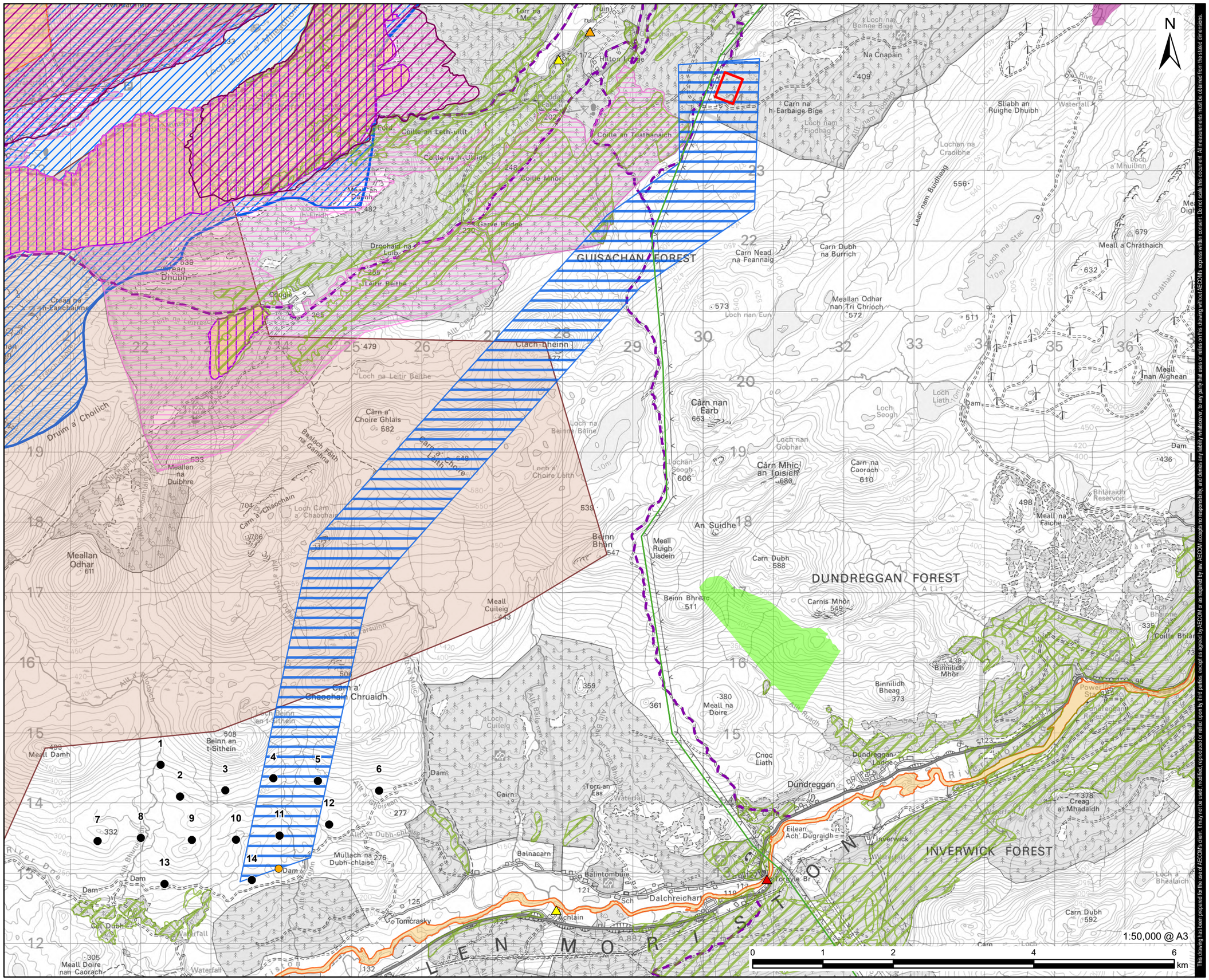
FIGURE TITLE

Environmental Constraints
Route Option D

FIGURE NUMBER

Figure 5 - 5



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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route E
- Beauly-Denny OHL
- Highland Council Core Paths
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C

Designated Sites

- Special Protection Area (SPA)
- Ancient Woodland
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Glen Affric National Scenic Area
- Wild Land Area

Woodland Carbon Code

- Broadleaved (>80%)
- Open ground

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FIGURE TITLE

Environmental Constraints
Route Option E

FIGURE NUMBER

Figure 5 - 6

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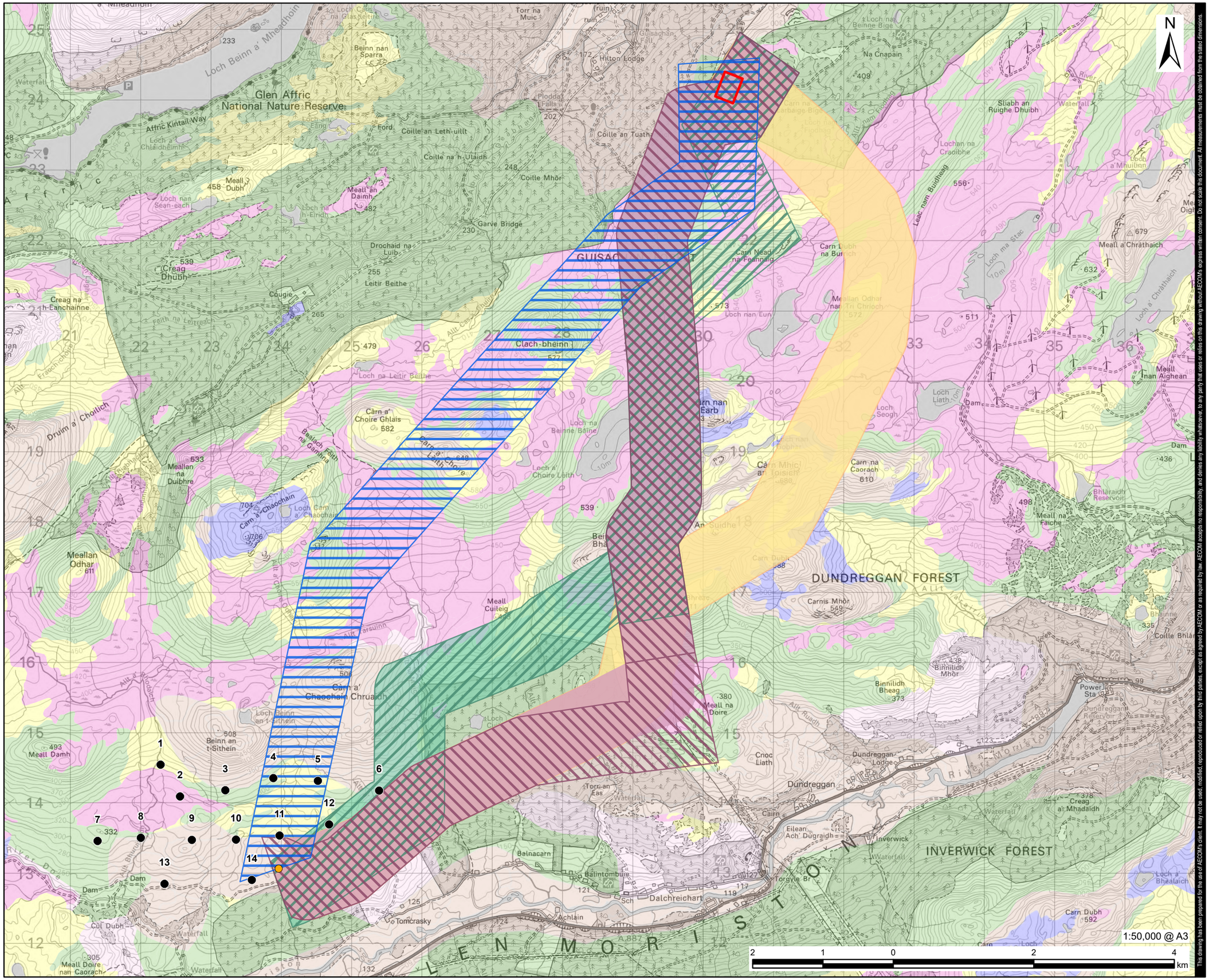

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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation
- Route A1
- Route B
- Route C
- Route D
- Route E

Carbon And Peatland

- Non-soil
- Mineral soil
- Class 1
- Class 2
- Class 3
- Class 4
- Class 5

NOTES

ISSUE PURPOSE

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PROJECT NUMBER

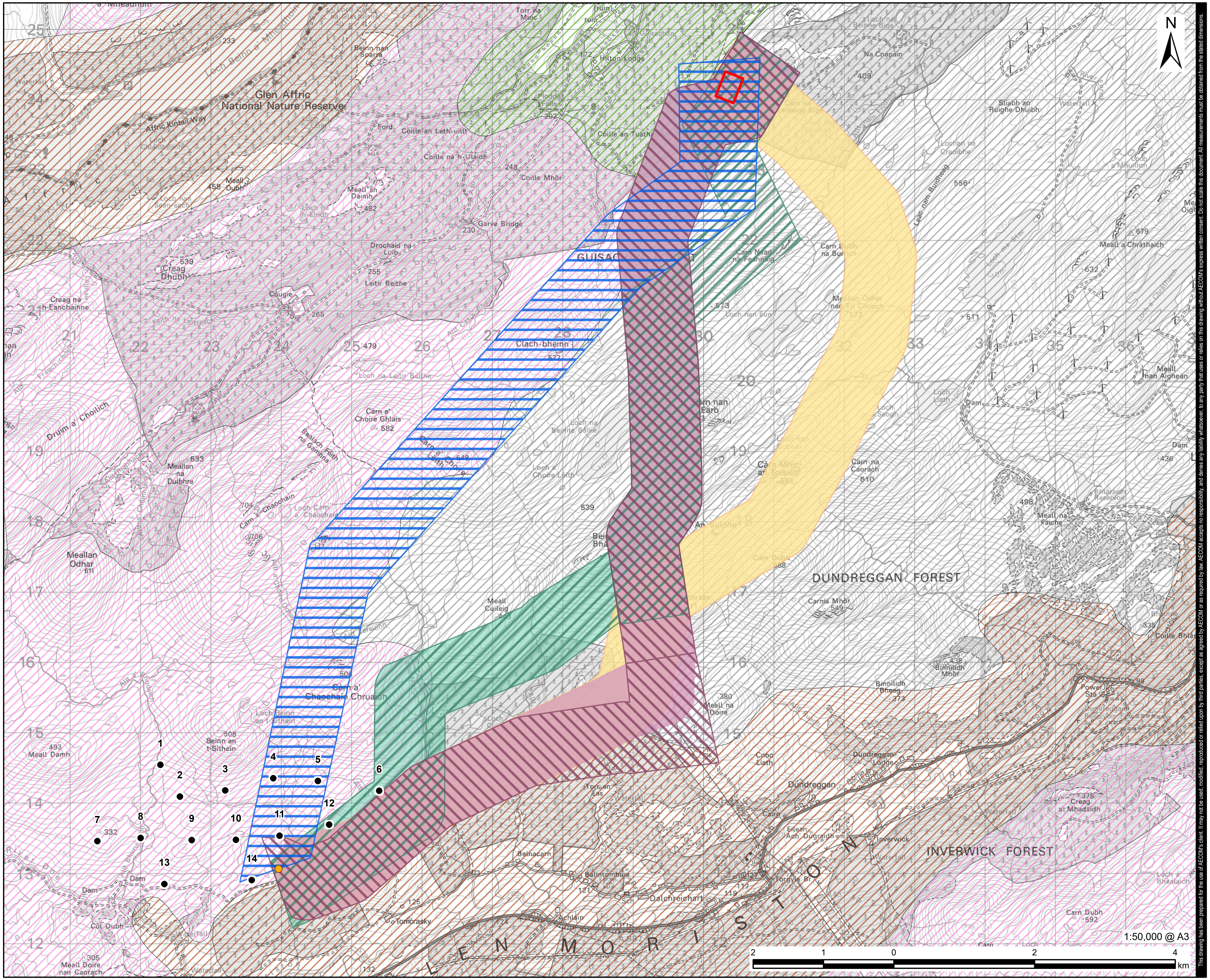
60719623

FIGURE TITLE

Carbon and Peatland

FIGURE NUMBER

Figure 5 - 7



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LEGEND

- Wind Turbine Location
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- Proposed Bingally Substation
- Route A1
- Route B
- Route C
- Route D
- Route E

Landscape Character Assessment

- Farmed Strath - Inverness
- Rocky Moorland Plateau - Inverness
- Rugged Massif - Inverness
- Wooded Glen - Inverness

NOTES

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FIGURE TITLE

Landscape Character Assessment

FIGURE NUMBER

Figure 5 - 8

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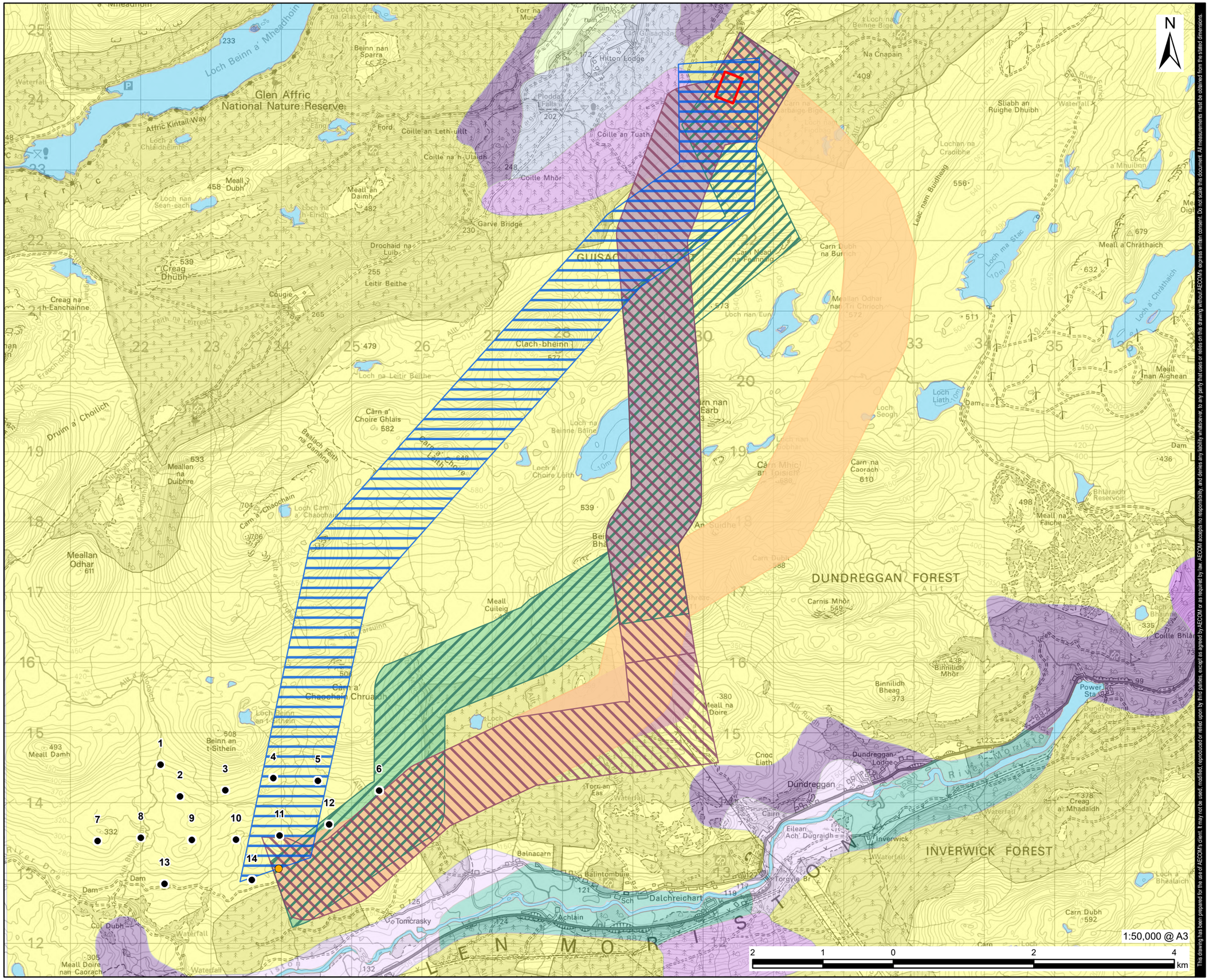

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LEGEND

- Wind Turbine Location
- Proposed Tomchrasky Windfarm
- Proposed Bingally Substation

Route Options

- Route A
- Route A1
- Route B
- Route C
- Route D
- Route E

Land Capability for Agriculture

- Class 4.1 - Land Suited to Arable Cropping
- Class 4.2 - Land Suited to Arable Cropping
- Class 5.1 - Land Suited only to Improved Grassland and Rough Grazings
- Class 5.2 - Land Suited only to Improved Grassland and Rough Grazings
- Class 5.3 - Land Suited only to Improved Grassland and Rough Grazings
- Class 6.1 - Land Suited only to Improved Grassland and Rough Grazings
- Class 6.2 - Land Suited only to Improved Grassland and Rough Grazings
- Class 6.3 - Land Suited only to Improved Grassland and Rough Grazings
- Class 999 - Inland Water
- Class 9500 - Unencoded Islands

NOTES

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PROJECT NUMBER

60719623

FIGURE TITLE

Landscape Character Assessment

FIGURE NUMBER

Figure 5 - 9