Technical Appendix 9.7: Peat Landslide Hazard Risk Assessment

Technical Appendix 9.7: Peat Landslide and Hazard Risk Assessment

9.7.1 Introduction

9.7.1.1 The objectives of the Peat Landslide and Hazard Risk Assessment (PLHRA) are to:

- Undertake a desk-based review of published information including geological, hydrogeological and topographical information, to inform the baseline for the PLHRA;
- Undertake site visits to identify evidence of, and potential for, active, incipient or relict peat instability, including identification of the location of features as required;
- Reporting on evidence of any active, incipient or relict peat instability, and the potential risk of future instability, describing the likely causes and contributory factors;
- Identify potential controls to be imposed during the construction phase to minimise the risk of any peat instability at the Site; and
- Provide recommendations for further work or specific construction methodologies to suit the ground conditions to mitigate against any increased risk of potential peat instability.

9.7.1.2 The scope of the PLHRA is as follows:

- Characterise the peatland geomorphology to determine whether there have been prior occurrences of instability, and whether contributory factors that might lead to instability in future are present across the Site;
- Determine the likelihood of a future peat landslide under natural conditions and in association with construction activities associated with the Proposed Development;
- Identify potential receptors that might be affected by peat landslides, should they occur, and quantify the associated risks;
- Provide appropriate mitigation and control measures to reduce the risks to acceptable levels such that the Proposed Development is constructed safely with minimal risks to the environment; and
- The contents of this PLHRA have been prepared in accordance with the Scottish Government's Best Practice Guidance[1], noting that the guidance *'should not be taken as prescriptive or used as a substitute for the developer's [consultant's] preferred methodology'.*

9.7.2 Methodology

9.7.2.1 A desk study and several field surveys were implemented to gather baseline conditions of the Site and allow a PLHRA to be completed. The desk study included an overview of the following elements to inform the baseline design:

- Bedrock and superficial geology from BGS Mapping[2];
- Peatland and peat characteristic information from The Scottish Natural Heritage (NatureScot) carbon rich soils, deep peat and priority habitat[3]
- Habitat survey information from **Chapter 7: Ecology (EIAR Volume 2)**;
- Hydrogeological and Hydrology information from **Chapter 9: Hydrology, Hydrogeology and Geology and Soils (EIAR Volume 2)**;
- Media articles, historic maps and local landowner accounts of historic land movements; and
- Meteorological rainfall data[4]

9.7.2.2 The results of the desk study are discussed in section 9.7.3 of this report.

Field Survey

9.7.2.3 Three rounds of peat survey were undertaken across the Site, based on the Proposed Development design. The surveys were designed based on best practice guidance for surveying developments on peatland[1].

9.7.2.4 The surveys were undertaken by Ramboll and Fluid Environmental Consulting Limited on the following dates:

- Stage 1 peat probing in May 2024; and
- Stage 2 peat probing and coring in June 2025 and November 2025.

9.7.2.5 The first survey comprised probing on a 100 m grid within the areas of likely peatland; and a 200 m grid in areas likely to be absent of peat soils. Where peat was encountered within the 200 m grid intervals then probe spacings were reduced to 100 m to delineate the areas of peat.

9.7.2.6 The second survey was undertaken in two phases; by Ramboll UK Limited (RUK) in June 2025 and Fluid in November 2025. The surveys were carried out along the Access Route, Internal Tracks, and in the planned turbine, hardstanding, and compound locations, known at the time of the surveys. The survey comprised probing at refined locations to target proposed turbine locations, Internal Tracks and potential borrow pit locations. Survey details are as follows:

- Proposed turbine locations: peat probing was undertaken at 10 m intervals along cardinal points from the central point of the infrastructure up to 50 m; and
- Internal Tracks: the alignment was probed at 50 m intervals along the Internal Track and at points every 10 m perpendicular to the centreline on either side of the proposed Internal Track. Where sections of existing Internal Tracks form part of the Proposed Development, the same sampling method was used, with the centreline recorded as existing Internal Track (and therefore having a peat depth of 0 m).

9.7.2.7 Peat cores were taken using a Gauge auger and a number of field tests and observations were undertaken to identify:

- Depth of acrotelm;
- Degree of humification (using Hodgson, 1974[5]), to establish amorphous, intermediate, fibrous and content;
- Degree of humification using the Von Post, (Hobbs, 1986[6]) classification;
- Fine fibre content, based on scale of F0 (none) to F3 (very high);

1 Scottish Government (2017). Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity.

2 British Geological Society BGS Geo Index mapping [Accessed 01/10/2025) Available: GeoIndex (onshore) - British Geological Survey

3 NatureScot Spatial Data Hub, URL: https://opendata.nature.scot/maps/171df29c8c5b45a9b93438a3bc5700c6

4 Met Office Weather Data Drumalbin: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcvk7n86b

5 Hodgson, J.M (1974) Soil Survey Field Handbook.

6 Hobbs N.B. (1986). Mire morphology and the properties and behaviour of some British and Foreign peats. Quarterly Journal of Engineering Geology, 19, pp7-80.

- Coarse fibre content, based on scale of R0 (none) to R3 (very high);
- Water content, based on scale of B1 (dry) to B5 (very wet); and
- Substrate underlying the peat where this was possible.

Limitations and Assumptions

9.7.2.8 Surveying has been undertaken based on the Proposed Development design and associated infrastructure locations available at the time of the survey. Should the infrastructure design change outside the incorporated limits of deviation, then further surveying and subsequent amendments to the PLHRA reporting may have to be undertaken. The data collected to inform this PLHRA is considered sufficient to support a robust assessment of the peat landslide hazards and risks.

9.7.3 Desk Study & Site Information

9.7.3.1 The Site location and setting are described in **Chapter 3: Site Description and Proposed Development (EIAR Volume 2)**.

9.7.3.2 The Access Route nomenclature and chainages are shown on Figure 9.7.6. All figures are provided at the end of this document.

Topography

9.7.3.3 The Site is situated along the ridgeline connecting Meall Mor, Meall an Tuirc, Bendeallt and Cnoc Gille Mo Bhrianaig with the elevation ranging from 625 m Above Ordnance Datum (AOD) to 310 m AOD, with the topography descending from the ridge in all directions to Loch Glass, Loch Moire and Strath Rusdale. The surrounding area includes the notable summits of Ben Wyvis (1,046 m AOD) and Beinn Dear (1,081 m AOD), with prominent hydrological features including the Cromarty Firth, Dornoch Firth, Loch Glass, Loch Morie, the River Averon and the River Glass. Topography and elevation are shown on **Figure 9.7.1**.

9.7.3.4 Slope angles at the Site, as shown on **Figure 9.7.2**.

Superficial Geology

9.7.3.5 The 1:50,000 scale geological mapping available from the British Geological Survey (BGS) shows the superficial geology present across the wind farm infrastructure area within the Site are peat deposits. Glacial Diamicton deposits are predominantly present beneath the Internal Tracks to the northeast and southeast of the Site.

9.7.3.6 Peat probing undertaken in 2024 and 2025 confirmed the presence of peat across the Site and within isolated pockets along the Access Route. The findings of the survey are presented within **Technical Appendix 9.5: Peat Depth Survey Results (EIAR Volume 4).**

9.7.3.7 The depth of superficial deposits was taken into account when selecting potential borrow pit locations, typically avoiding areas with >0.5 m peat or other superficial deposits. A maximum depth of 0.3 m of peat was observed at the proposed borrow pit location. The borrow pit search area to the west of the Site was rejected as this had significant peat deposits across the majority of the borrow pit search. An overburden depth of less than 0.5 m has been assumed for the proposed borrow pit.

Bedrock Geology

9.7.3.8 The 1:50,000 scale geological mapping available from the British Geological Survey (BGS) shows the majority of the Site is underlain by Precambrian aged Tarvie Formation, Psammite rocks belonging to the Lloch Eil Group. The BGS Lexicon[7] describes the formation as a thinly bedded, siliceous to micaceous metamorphic sandstones with lenses of Quartzite towards the base of the formation. To the eastern extents of the Site, Lower Old Red Sandstone formation rocks including sandstones and conglomerates are shown to be present. The proposed borrow pit is shown to be located within the Tarvie Psammite rock formation.

Structural Geology

9.7.3.9 BGS mapping shows one fault line, running approximately in a southwest to northeast direction with unknown displacement. This fault line marks the boundary between the Tarvie and Old Red Sandstone rock formations.

Hydrology

- The BGS 1:625,000 scale hydrogeology mapping[8] defines the rocks as follow:
- Tarvie Psammite formation – Low productivity Aquifer with limited groundwater in near surface weathered zone and secondary fractures; and
- Old Red Sandstone Formation - Moderately productive aquifer. Locally important multi-layered aquifer.

Surface Water Features

9.7.3.10 The majority of the Site and proposed Access Route is located within the River Alness catchment. The southern regions of the Site are within River Glass catchment. The River Glass is assessed to have an overall Moderate condition under the Water Framework Directive (WFD) Classification.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

9.7.3.11 No high dependency areas of GWDTE are present within the Site. This report should be read in conjunction with **Technical Appendix 9.3 GWDTE (EIAR Volume 4)** which details these findings**.**

9.7.3.12 The borrow pit search area has been selected to avoid borrow pit extraction within 50 m of existing watercourses or waterbodies and with standard mitigation (i.e., an upslope cut-off/ diversion ditch to intercept surface water together with minor attenuation features or soakaways) the borrow pits are not considered likely to have any significant effect on surface water.

Private Water Supplies

9.7.3.13 The following information should be read in conjunction with **Chapter 9 Hydrology, Hydrogeology, Geology and Soils (EIAR Volume 2)**.

9.7.3.14 As per **Figure 9.7.4**, one PWS abstraction source is located within the Site, on the Access Route at approximately chainage 2200 m.

9.7.3.15 Beyond the Site, PWS abstraction sources are shown to be situated to the west of the Access Route, all beyond 100 m from the Site.

Land use

9.7.3.16 The Site comprises active wind turbines situated within areas of open moorland and semi-improved grassland and Internal Tracks run through the centre. The Site is accessed from the south by the

[7] British Geological Survey, BGS Lexicon of Named Rock Units. [Accessed 09/01/2026] Available: SEARCH Rock Name Database | Lexicon of Named Rock Units | British Geological Survey (BGS)

[8] British Geological Survey, 1:625,000 scale digital hydrogeological data. [Accessed 01/10/2025] Available: http://www.bgs.ac.uk/products/hydrogeology/maps.html

Main Vehicular Access Point, and from the northeast by the Secondary Vehicular Access Point. The substation is situated approximately 700 m to the north-east of the Turbine Array.

Geomorphology

9.7.3.17 Digital aerial photography and Digital Terrain Model (DTM) LIDAR data was used to interpret and map geomorphological features within the developable areas of the Site. This interpretation and the resulting geomorphological map, as shown in Figure 9.7.4 were subsequently verified during Site walkover surveys undertaken by an experienced hydrologist in October 2024 and peatland geomorphologists in June 2024, April 2025, and August 2025.

9.7.3.18 The geomorphological features recorded are shown on **Figure 9.7.4**. The presence, characteristics and distribution of peatland geomorphological features have been defined to understand the hydrological function of the peatland, with reference to the balance of erosion and peat accumulation (or condition), and the sensitivity of peatland to potential land-use changes.

9.7.3.19 Some evidence of peat instability was identified during the surveys, with features including hags, groughs, and other peat erosion noted. Several localised areas of peat flushes were recorded across the Site which displayed basal erosion of peat due to surface water run-off. No major instability features, evidence of incipient instability or past landslides were noted within the Site.

9.7.4 Field Survey

9.7.4.1 Results from the peat surveys are detailed within Technical Appendix 9.5 Peat Depth Survey Results (EIAR Volume 4).

Peat Depth and Character

9.7.4.2 A combined total of 1,971 peat depth probes were taken during the peat surveys. This included 314 peat depth probes during the Stage 1 survey, and 1,657 peat depth probes during the Stage 2 surveys.

9.7.4.3 The peat depth survey results indicate approximately half of the locations surveyed to be underlain by areas where either no peat is present, or a shallow depth of peat is present (approximately 52% of peat depth probes recorded peat depths less than or equal to 0.5 m depth). This includes areas where existing Internal Track is present and where therefore peat has already been excavated. Approximately 34% of points surveyed recorded peat depths greater than 1 m depth, with the maximum peat depth recorded being 3.55 m. The mean peat depth recorded during the surveys was 0.73 m.

9.7.4.4 The frequency distribution of peat depths is summarized as follows:

- 697 no. samples (35.4%) located on land with no peat present;
- 321 no. samples (16.3%) located on land with >0.0 m and ≤0.5 m depth of peat or organo-mineral soil;
- 273 no. samples (13.9%) located on land with >0.5 m and ≤1.0 m depth of peat;
- 321 no. samples (16.3%) located on land with >1.0 m and ≤1.5 m depth of peat;
- 243 no. samples (12.3%) located on land with >1.5 m and ≤2.0 m depth of peat;
- 88 no. samples (4.5%) located on land with >2.0 m and ≤2.5 m depth of peat;
- 24 no. samples (1.2%) located on land with >2.5 m and ≤3.0 m depth of peat; and
- 3 no. samples (0.2%) located on land with >3.0 m and ≤4.0 m depth of peat.

9.7.5 Peat Instability

Types of Peat Instability

9.7.5.1 Peat instability can be defined as either 'minor instability' or 'major instability' and observed by both field observations and through desk top review of aerial/satellite imagery of the Site:

- Minor instability can be defined as localised and small-scale features that are not generally precursors to major failure and including gully sidewall collapses, pipe ceiling collapses, minor slumping along diffuse drainage pathways (e.g. along flushes). Indicators of minor instability include presence of tension cracks, compression ridges, or bulges; and
- Major instability can be defined by peat landslides.

9.7.5.2 For the purposes of this assessment, landslide classification is simplified and split into three main types:

- Multiple peat slides with displaced slabs and exposed substrate;
- Bog burst with peat retained within the failed area; and
- Multiple peat soil slides with displacement of thin soils exposing substrate.

9.7.5.3 The term 'peat slide' is used to refer to large-scale landslides and occur 'top-down' from the point of initiation on a slope in thinner peats (between 0.5 m and 1.5 m) and on moderate slope angles (typically 5-15°).

9.7.5.4 The term 'bog burst' is used to refer to very large-scale failures where peat is typically deeper (greater than 1.0 m and up to 10 m) and more amorphous than sites experiencing peat slides, with shallower slope angles (typically 2-5°).

9.7.5.5 'Peaty soil slide' is used to refer to small-scale slab-like slides in organic soils generally <0.5 m thick.

Factors Contributing to Peat Instability

9.7.5.6 Peat landslides are caused by a combination of preconditioning factors and triggering factors. The combined factors are discussed in greater detail in the Landslide Susceptibility Approach Section of this report. Triggering factors have an immediate or rapid effect on the stability of a peat accumulation whereas preconditioning factors can influence peat stability over a much longer period. Only some of these factors can be addressed by site characterisation.

9.7.5.7 Preconditioning factors may influence peat stability over long periods of time (years to hundreds of years), and include:

- Impeded drainage caused by a peat layer overlying an impervious clay or mineral base (hydrological discontinuity);
- A convex slope or a slope with a break of slope at its head (concentration of subsurface flow);
- Proximity to local drainage, either from flushes, pipes or streams (supply of water);
- Connectivity between surface drainage and the peat/impervious interface (mechanism for generation of excess pore pressures);
- Artificially cut transverse drainage ditches, or grips (elevating pore water pressures in the basal peat mineral matrix between cuts, and causing fragmentation of the peat mass);
- Increase in mass of the peat slope through peat formation, increases in water content or afforestation;

- Reduction in shear strength of peat or substrate from changes in physical structure caused by progressive creep and vertical fracturing (tension cracking or desiccation cracking), chemical or physical weathering or clay dispersal in the substrate;
- Loss of surface vegetation and associated tensile strength (e.g. by burning or pollution induced vegetation change);
- Increase in buoyancy of the peat slope through formation of sub-surface pools or water-filled pipe networks or wetting up of desiccated areas; and
- Afforestation of peat areas, reducing water held in the peat body, and increasing potential for formation of desiccation cracks which are exploited by rainfall on forest harvesting.

9.7.5.8 Triggering factors are typically of short duration (minutes to hours) and any individual trigger event can be considered as a result of cumulative events:

- Intense rainfall or snowmelt causing high pore pressures along pre-existing or potential rupture surfaces e.g. between the peat and substrate;
- Rapid ground accelerations e.g. from earthquakes or blasting; unloading of the peat mass by fluvial incision or by artificial excavations e.g. cutting;
- Focusing of drainage in a susceptible part of a slope by alterations to natural drainage patterns e.g. by pipe blocking or drainage diversion; and
- Loading by plant, spoil or infrastructure.

9.7.5.9 External environmental triggers such as rainfall and snowmelt cannot be mitigated, though they can be managed e.g. by limiting construction activities during periods of intense rain.

9.7.5.10 Unloading of the peat mass by excavation, loading of the peat by plant and focusing of drainage can be managed and mitigated by careful design, site specific stability analyses, informed working practices and monitoring.

Approaches to Assessing Peat Instability

9.7.5.11 This report considers a qualitative contributory factor-based approach and conventional stability analysis through limit equilibrium or Factor of Safety (FoS) analysis.

9.7.5.12 The advantage of the former is that many observed relationships between reported peat landslides and ground conditions can be considered together where a FoS is limited to consideration of a limited number of geotechnical parameters. The disadvantage is that the outputs of such an approach are better at illustrating relative variability in landslide susceptibility across a site rather than absolute likelihood.

9.7.5.13 The advantage of the FoS approach is that clear thresholds between stability and instability can be defined and modelled numerically. However, in reality there is considerable uncertainty in input parameters, and it is a generally held view that the geomechanical basis for stability analysis in peat is limited given the nature of peat as organic material, rather than mineral soil.

9.7.5.14 To reflect these limitations, both approaches are adopted and outputs from each approach integrated in the assessment of landslide likelihood.

Assessment of Peat Landslide Likelihood

Introduction

9.7.5.15 This section provides details on the landslide susceptibility and limit equilibrium approaches to the assessment of peat landslide likelihood used in this report. The assessment of likelihood is a key step in the calculation of risk, where risk is expressed as follows:

Risk = Probability of a Peat Landslide x Adverse Consequences

9.7.5.16 The probability of a peat landslide is expressed in this Technical Appendix as peat landslide likelihood and is considered below.

Limit Equilibrium Approach

9.7.5.17 Stability analysis has been undertaken using the infinite slope model to determine the FoS for a series of 25 m x 25 m cells within the proposed developable area. The limit equilibrium approach has been applied within areas where the peat thickness is over 0.5 m. The limit equilibrium approach is the most frequently cited approach for the quantitative assessment of the stability of peat slopes. The approach assumes that failure occurs by shallow translational land sliding, which is the mechanism usually interpreted for peat slides. Due to the relative length of the slope and depth to the failure surface, end effects are considered negligible and the safety of the slope against sliding may be determined from analysis of a 'slice' of the material within the slope.

9.7.5.18 The stability of a peat slope is assessed by calculating a Factor of Safety, F, which is the ratio of the sum of resisting forces (shear strength) and the sum of driving forces (shear stress):

$$\frac{c' + (\gamma - h\gamma_w)\, z\, cos^2\, \beta\, tan\, \phi')}{\gamma z\, sin\, \beta\, cos\, \beta}$$

In this formula:

- c is the effective cohesion (kPa);
- γ is the bulk unit weight of saturated peat (kN/m^3);
- γw is the unit weight of water (kN/m^3);
- z is the vertical peat depth (m),
- h is the height of the water table as a proportion of the peat depth;
- β is the angle of the substrate interface (°); and
- ϕ' is the angle of internal friction of the peat (°).

9.7.5.19 This form of the infinite slope equation uses effective stress parameters, and assumes that there are no excess pore pressures, i.e., that the soil is in its natural, unloaded condition.

9.7.5.20 The choice of water table height reflects the full saturation of the soils that would be expected under the most likely trigger conditions, i.e., heavy rain.

9.7.5.21 Where the driving forces exceed the shear strength (i.e. where the bottom half of the equation is larger than the top), F is <1, indicating instability. A FoS between 1 and 1.4 is normally taken in engineering terms to indicate marginal stability (providing an allowance for variability in soil strength, depth to failure). Slopes with a FoS greater than 1.4 are generally considered to be stable.

9.7.5.22 There are numerous uncertainties involved in applying geotechnical approaches to peat, not least because of its high-water content, compressibility and organic composition. Peat comprises organic matter in various states of decomposition with both pore water and water within plant constituents, and the frictional particle-to-particle contacts that are modelled in standard geotechnical approaches are different in peats. There is also a tensile strength component to peat which is assumed to be dominant in the acrotelm, declining with increasing decomposition and depth. As a result, analysis utilising geotechnical approaches is often primarily of value in showing relative stability across a site given credible and representative input parameters rather than in providing an absolute estimate of stability. With this in mind, representative data inputs have been derived from published literature and used for drained analysis only.

Data Inputs

9.7.5.23 Stability analysis was undertaken using GIS software and a 25 m x 25 m grid was superimposed on areas of peat only, with key input parameters derived for each grid cell. A 25 m x 25 m cell size was

chosen because it is sufficiently small to define a minimum credible landslide size and avoid 'smoothing' of important topographic irregularities. Given the cell size of the input DTM, which provides a key input parameter, any smaller cell size would be unlikely to provide significant benefits.

9.7.5.24 Table 9.7.1 shows the input parameters and assumptions for the stability analyses undertaken. The shear strength parameters c' and ϕ' are usually derived in the laboratory using undisturbed samples of peat collected in the field and therefore site-specific values are often not available ahead of detailed site investigation for a development. Therefore, for this assessment a literature search has been undertaken to identify a range of credible but conservative values for c' and ϕ' quoted in fibrous and humified peats. FoS analysis was undertaken with conservative ϕ' of 20° and values of 2 kPa and 5 kPa for c'.

Table 9.7.1: Geotechnical Parameters for Drained Infinite Slope Analysis

Parameter	Values	Rationale	Source
Effective Cohesion (c')	2, 5	Credible conservative cohesion values for humified peat based on literature review	5.5 - 6.1 - peat type not stated (Long, 2005)[9] 3, 4 - peat type not stated (Long, 2005)[8] 5 - basal peat (Warburton et al., 2003)[10] 8.74 - fibrous peat (Carling, 1986)[11] 4 - peat type not stated (Dykes and Kirk, 2001)[12] 7 – 12 - H8 peat (Huat et al, 2014)[13]
Bulk Unit Weight (γ)	10.5	Mid-range value for humified catotelmic peat taken from Laboratory testing	10.1 – catotelm peat (Mills, 2002)[14] 10.1 – Irish bog peat (Boylan et al, 2008)[15]
Effective Angle of Internal Friction (ϕ')	22	Credible conservative friction angle for humified peat based on literature review	40 – 65 - fibrous (Huat et al, 2014)[12] 50 – 60 - amorphous (Huat et al, 2014)[12] 36.6 - 43.5 - peat type not stated (Long, 2005)[8] 31 – 55 - Irish bog peat (Hebib, 2001)[16] 34 – 48 - fibrous sedge pear (Farrell & Hebib, 1998)[17] 32 – 58 - peat type not stated (Long, 2005)[8] 23 - basal peat (Warburton et al, 2003)[9] 21 - fibrous peat (Carling, 1986)[10]
Slope Angle from Horizontal (β)	Various	Mean slope angle per 25 m x 25 m grid cell	5 m DTM of site
Peat Depth (z)	Various	Mean peat depth per 25 m x 25 m grid cell	Interpolated peat depth model of site
Height of Water Table as a Proportion of Peat Depth (h)	1	Assumes peat mass is fully saturated (normal conditions during intense rainfall events or snowmelt, which are the most likely natural hydrological conditions at failure)	Assumed

Results

9.7.5.25 Figure 9.7.6 shows the results for drained analysis of the peat areas at the Site for the more conservative of the two parameter sets above (ϕ' of 22° and c' of 2 kPa). The results indicate that even with conservative parameters, Factors of Safety demonstrate stability across most of the Site (FoS >1.4).

9.7.5.26 Areas of marginally unstable ground (1.0 – 1.4) ground are present on Site and would require mitigation measures as per Section 9.7.8.

Landslide Susceptibility Approach

9.7.5.27 The landslide susceptibility approach is based on the layering of contributory factors to produce unique 'slope facets' that define areas of similar susceptibility to failure. The number and size of slope facets would vary from one part of the Site to another according to the complexity of ground conditions. As with the limit equilibrium approach, facets were only defined in areas of true peat.

9.7.5.28 Eight contributory factors are considered in the analysis:

- slope angle (S);
- peat depth (P);
- substrate geology (G);
- peat geomorphology (M);
- drainage (D);
- forestry (F);
- slope convexity (C); and
- land use (L).

9.7.5.29 For each factor, a series of numerical scores between 0 and 3 are assigned to factor 'classes', the significance of which is tabulated for each factor. The higher a score, the greater the contribution of that factor to instability for any particular slope facet. Scores of 0 imply neutral/negligible influence on instability.

9.7.5.30 Factor scores are summed for each slope facet to produce a peat landslide likelihood score (SPL), the theoretical maximum being 24 (8 factors, each with a maximum score of 3):

SPL = SS + SP + SG + SM + SD + SF + SC + SL

9.7.5.31 In practice, a maximum score is unlikely, as the chance of all contributory factors having their highest scores in one location is very small.

[9] Long M (2005) Review of peat strength, peat characterisation and constitutive modelling of peat with reference to landslides.

[10] Warburton *et al* (2003) Anatomy of a Pennine peat slide, Northern England. Earth Surface Processes and Landforms.

[11] Carling (1986) Peat slides in Teesdale and Weardale, Northern Pennines, July 1983: description and failure mechanisms.

[12] Dykes and Kirk (2001) Initiation of a multiple peat slide on Cuilcagh Mountain, Northern Ireland.

[13] Huat *et al* (2014) Geotechnics of organic soils and peat.

[14] Mills (2002) Peat slides: Morphology, Mechanisms and Recovery

[15] Boylan N, et al (2008) Peat slope failure in Ireland

[16] Hebib (2001) Experimental investigation of the stabilisation of Irish peat

[17] Farrell and Hebib (1998) The determination of the geotechnical parameters of organic soils

9.7.5.32 Figures to show the spatial distribution of each factor across the site are shown in Figures 9.7.7.1 to 9.7.7.8 of this report.

Slope Angle

9.7.5.33 Table 9.7.2 shows the slope ranges, their significance and related scores for the slope angle contributory factor. Slope angles were derived from the 5 m DTM and scores assigned based on reported slope angles associated with peat landslides rather than a simplistic assumption that 'the steeper a slope, the more likely it is to fail'.

Table 9.7.2: Slope Classes, Significance and Scores

Slope Range (°)	Significance	Score
>20.0	Failure typically occurs as peaty debris slides due to low thickness of peat	1
15.1-20.0	Failure typically occurs as peaty debris slides due to low thickness of peat	2
10.1-15.0	Failure typically occurs as peat slides, bog slides or peaty debris slides, a key slope range for reported population of peat failures	3
5.1-10.0	Failure typically occurs as peat slides, bog slides or peaty-debris slides, a key slope range for reported population of peat failures	3
2.1-5.0	Failure typically occurs as bog bursts, bog flows or peat flows; peat slides and peaty debris slides rare due to low slope angles	2
≤2.0	Failure is very rarely associated with flat ground, neutral influence on stability	0

9.7.5.34 Figure 9.7.7.1 shows the distribution of slope angle scores across the Site.

Peat Depth (P)

9.7.5.35 Table 9.7.3 shows the peat depths, their significance and related scores for the peat depth contributory factor. Peat depths were derived from the peat depth model shown on Figure 9.7.5 and reflect the peat depth ranges most frequently associated with peat slides (Evans and Warburton, 2007)[18].

Table 9.7.3: Peat Depth Classes, Significance and Scores

Depth Range (m)	Significance	Score
>1.5	Sufficient thickness for any type of peat failure	2
1.0-1.5	Sufficient thickness for peat slide or bog slide	3
0.5-1.0	Sufficient thickness for peat or bog slide and peaty-debris slide but not for bog burst	3
<0.5	Organic soil rather than peat, failures would be peaty-debris slides	1
No Organic Soil	No organic soil and therefore failures cannot be interpreted as peat slides, neutral influence on stability	0

Substrate Geology

9.7.5.36 Table 9.7.4 shows substrate type, significance and related scores for the peat depth contributory factor. The shear surface or failure zone of peat failures typically overlies an impervious clay or mineral (bedrock) base giving rise to impeded drainage. This, in part, is responsible for the presence of peat, but also precludes free drainage of water from the base of the peat mass, particularly under extreme conditions (such as after heavy rainfall, or snowmelt).

9.7.5.37 Peat failures are frequently cited in association with glacial till deposits in which an iron pan is observed in the upper few centimetres. They have also been observed over glacial till without an obvious iron pan, or over impermeable bedrock. They are rarely cited over permeable bedrock, probably due to the reduced likelihood of peat formation.

Table 9.7.4: Substrate Geology Classes, Significance and Scores

Substrate Geology	Significance	Score
Glacial Till with Iron Pan	Failures often associated with underlying till; particularly where impermeable iron pan provides polished shear surface	3
Glacial Till	Failures often associated with underlying till	2
Impermeable Bedrock	Failures sometimes associated with bedrock, particularly if smooth top surface	1
Permeable Bedrock	Failures rarely associated with permeable bedrock (peat is often thin or absent), neutral influence on stability	0

9.7.5.38 Figure 9.7.7.3 shows the distribution of substrate geology scores across the Site. The results indicate that the Site is underlain mostly by permeable bedrock with small areas of Glacial Till.

Peat Geomorphology

9.7.5.39 Table 9.7.5 shows the geomorphological features identified across the Site, their significance and related scores.

Table 9.7.5: Peat Geomorphology Classes, Significance and Scores

Geomorphology	Significance	Score
Adjacent/upslope (<50 m) to existing instability (peat slide, peaty-debris slide, bank failure)	Failures often associated with underlying till; particularly where impermeable iron pan provides polished shear surface	3
Incipient instability (tension crack, compression ridge, bulging, quaking bog)	Failures are likely to occur where incipient failure morphology is observed	3
Undrained intact planar peat	Failures are most frequently recorded in intact peat, planar peat	2
Diffuse natural drainage/pool/flush	Failures are often associated with areas of diffuse subsurface drainage (such as flushes)	2
Pipe/Collapsed Pipe	Failures are often associated with areas of soil piping	2
Existing Peat Slide	Failures typically stabilise and do not reactivate after the initial event	1
Gullied/Dissected/Hagged/Eroded Peat/Bare Peat/Bare Ground	Failures are rarely recorded in peat fragmentated by erosion	1

9.7.5.40 Figure 9.7.7.4 shows the distribution of geomorphology scores across the Site.

[18] Evans, M & Warburton, J 2007, Geomorphology of Upland Peat: Erosion, Form and Landscape Change.P104-135

Drainage (D)

9.7.5.41 Table 9.7.6 shows artificial drainage feature classes, their significance and related scores. Transverse/oblique drainage lines may reduce peat stability by creating lines of weakness in the peat slope and encouraging the formation of peat pipes. Review of published literature indicates that a number of peat failures have been identified which have failed over moorland grips. The influence of changes in hydrology becomes more pronounced the more transverse the orientation of the drainage lines are relative to the overall slope.

Table 9.7.6: Drainage Feature Classes, Significance and Scores

Significance	Score
Failures are sometimes reported in association with artificial drains oblique/ transverse to slope	3
Failures are rarely associated with artificial drains parallel to slope	1
Neutral influence on stability	0

9.7.5.42 Figure 9.7.7.5 shows the distribution of drainage feature scores across the Site.

Forestry (F)

9.7.5.43 Table 9.7.7 shows forestry classes, their significance and related scores.

Table 9.7.7: Forestry Classes, Significance and Scores

Forestry Class	Significance	Score
Afforested area (with mature trees), ridge and furrows oblique to slope	Peat underlying forestry stands with rows aligned oblique to slope has inter ridge cracks which are conducive to slope instability	2
Afforested area (with mature trees), ridge and furrows aligned to slope	Peat underlying forestry stands with rows aligned with slope is conducive to slope instability, but less so than where rows are aligned oblique to slope	1
Deforested area (few or no trees), ridge and furrows oblique to slope	Peat underlying deforested stands has a higher water table and more neutral buoyancy, but retains inter ridge cracks (lines of weakness) conducive to instability; alignment of cracks oblique to slope is most conducive to instability	3
Deforested area (few or no trees), ridge and furrows aligned to slope	Peat underlying deforested stands has a higher water table and more neutral buoyancy, but retains inter ridge cracks (lines of weakness), however, orientation of these cracks is less critical when aligned to slope	2
Not Afforested	Neutral influence on stability	0

9.7.5.44 Figure 9.7.7.6 shows the distribution of forestry feature scores.

Slope Convexity (C)

9.7.5.45 Table 9.7.8 shows profile convexity classes, significance and related scores. Convex and concave slopes (i.e., positions in a slope profile where slope gradient changes by a few degrees) can be associated with the initiation point of peat landslides. Convexities are often associated with thinning of peat; such that thicker peat upslope applies stresses to thinner 'retaining' peat downslope. Conversely, buckling and tearing of peat may trigger failure at concavities (Dykes and Warburton, 2007[19]). However, review of reported peat landslide locations against Google Earth elevation data (Mills and Rushton, 2023[20]) indicates that the majority of peat slides occur on rectilinear (uniform) slopes and that the reporting of convexity as a key driver may be misleading. Therefore, rectilinear slopes are assigned the highest score within this assessment.

Table 9.7.8: Convexity Feature Classes, Significance and Scores

Convexity Feature	Significance	Score
Convex Slope	Peat failures are often reported on or above convex slopes	3
Concave Slope	Peat failures are occasionally reported in association with concave slopes	1
Rectilinear Slope	Rectilinear slopes show no particular predisposition to failure, neutral influence on stability	0

9.7.5.46 Figure 9.7.7.7 shows the distribution of convexity feature scores across the site. Slopes are shown to be predominantly rectilinear in nature across the Site with interspersed areas of undulating ground.

Land use (L)

9.7.5.47 Table 9.7.9 shows land use classes, significance and related scores. A variety of land uses have been associated with peat failures which form the scoring and potential for failure.

Table 9.7.9: Land Use Feature Classes, Significance and Scores

Land Use	Significance	Score
Cutting/Turbary	Peat failures are often associated with peat cuttings/turbary	3
Adjacent quarrying	Failures are occasionally reported adjacent to quarries (usually as bog bursts, bog flows or peat flows)	2
Burning	Failures are rarely associated with burning though this activity may create pathways for water to the base of peat	1
Other Land Use	Failures are rarely associated with other forms of land use	0

9.7.5.48 Figure 9.6.7.8 shows the distribution of land use feature scores across the Site.

Likelihood Scores

9.7.5.49 The eight contributory factor layers shown on Figure 9.7.8 were combined in GIS software to produce likelihood scores for a peat landslide. These likelihood scores were then converted into descriptive 'likelihood classes' from 'Very Low' to 'Very High' with a corresponding numerical range of 1 to 5 and are described in Table 9.7.10 below.

[19] Dykes, A. and Warburton, J. 2007. Mass movements in peat: A formal classification scheme. Geomorphology, 86, 73-93)

[20] Mills, A.J. and Rushton, D. 2023. A risk-based approach to peatland restoration and peat instability. NatureScot Research Report 1259

Table 9.7.10: Likelihood Classes Derived from the Landslide Susceptibility Methodology			
Summed Contributory Factor Scores	**Typical Site Conditions Associated with Score**	**Qualitative Likelihood**	**Peat Landslide Likelihood Score**
≤8	Unmodified peat with no more than low weightings for peat depth, slope angle, underlying geology and peat morphology	Very Low	1
8-13	Unmodified or modified peat with no more than moderate or some high scores for peat depth, slope angle, underlying geology and peat morphology	Low	2
14-18	Unmodified or modified peat with high scores for peat depth and slope angle and/or high scores for at least three other contributory factors	Moderate	3
19-21	Modified peat with high scores for peat depth and slope angle and several other contributory factors	High	4
>21	Modified peat with high scores for most contributory factors (unusual except in areas with evidence of incipient instability)	Very High	5

9.7.5.50 Table 9.7.10 describes the basis for the likelihood classes. Professional judgement was made that for a facet to have a moderate or higher likelihood of a peat landslide, a likelihood score would be required equivalent to both the worst-case peat depth and slope angle scores (3 in each case, i.e., 3 x 2 classes) alongside three intermediate scores (of 2, i.e., 2 x 3 classes) for other contributory factors. This means that any likelihood score of 14 or greater would be equivalent to at least a moderate likelihood of a peat landslide. Given that the maximum score attainable is 24, this seems reasonable.

9.7.6 Peat Slide Risk Assessment and Mitigation

9.7.6.1 Table 9.7.11 below defines the stability risk assessment based on the peat slide likelihood and the required mitigation actions for each Risk Level.

Table 9.7.11: Risk Assessment		
Peat Slide Likelihood	**Potential Stability Risk (Pre-Mitigation)**	**Mitigation Action**
Very Low	Very Low	No peat present>0.5 m and therefore no mitigation action required
Low	Unlikely/Low	Development of a site-specific construction and management plan for peat areas
Moderate	Likely/Medium	As for Low condition plus may require mitigation to improve site conditions.
High	Probable High	Unacceptable level of risk, the area should be avoided. If unavoidable, detailed investigation and quantitative assessment required to determine stability with long term monitoring.
Very high	Almost Certain/Very high	Unacceptable level of risk, the area should be avoided

9.7.6.2 Table 9.7.12 shows the risk level (Likelihood) and required mitigation measures proposed for the turbines and Internal Tracks of the Proposed Development.

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Turbine Locations				
Turbine 1	2.22	6.99	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Turbine 2	1.43	6.20	Low	Although peat recorded >0.5 m depth, peat slide likelihood is low and FoS considered the ground to be stable.
Turbine 3	1.90	7.00	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Turbine 4	2.20	6.39	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Turbine 5	1.01	5.53	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Turbine 6	1.84	10.93	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Turbine 7	1.50	10.32	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Turbine 8	1.71	8.42	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Turbine 9	1.22	13.77	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Compounds/Substation & Borrow Pit				
Construction Compound, nearest Turbine 9	1.39	5.22	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Construction Compound, nearest Turbine 7	1.60	8.73	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Construction Compound, start of HGV track	0.00	0.36	Very Low	No peat recorded >0.5 m depth. No mitigation required
Substation	0.53	3.59	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Borrow Pit	0.40	13.0	Very Low	No peat recorded >0.5 m depth. No mitigation required
Internal Tracks: Heavy Goods Vehicle = HGV, Light Goods Vehicle = LGV and Substation Access = SA.				
From Turbine 1 to chainage 200 m	2.52	8.20	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 200 m and Chainage 400 m	1.17	11.74	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Chainage 600 m to Turbine 2	1.03	12.69	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Turbine 2 till end of Hardstand 2	1.21	9.67	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From End of Hardstand 2 to Start of Hardstand 3	1.14	11.34	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Start of Turbine 3 to End of Hardstand 3	1.57	10.15	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
End of Hardstand 3 to Chainage 1400 m	2.00	16.08	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Section between Chainage 1400m and Chainage 1600m	2.52	12.00	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 1600 m and Chainage 1800 m	2.14	5.22	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 1800 m and Chainage 2000 m	2.60	2.84	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Chainage 2000 m to Junction near Turbine 4	1.66	2.62	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction to Turbine 4	2.50	6.89	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Junction near Turbine 4 to start of Turbine 5	1.37	8.91	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Turbine 5 to End of Hardstand 5	1.34	7.84	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 2600m and Chainage 2800 m	1.10	8.66	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 2800 m and Chainage 3000 m	0.67	8.81	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 3000 m and Chainage 3200 m	1.81	8.19	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 3200 m and Chainage 3400 m	2.92	5.73	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
From Chainage 3400 m to Junction near Turbine 6	3.38	4.15	Moderate	High risk level area situated 20 m North-East of existing Internal Track based upon unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Junction to Turbine 6	2.43	7.63	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction to End of HGV	2.82	4.71	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction near turbine 6 to Junction for Turbine 7	2.45	6.57	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction for Turbine 7 to End of Hardstand 7	1.58	7.96	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
End of Hardstand 7 to Turbine 7	1.79	7.18	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Junction for Turbine 7 to Junction for Turbine 8	1.93	8.07	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Junction for Turbine 8 to Construction compound	1.42	8.65	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction for turbine 8 to End of Hardstand 8	1.53	9.08	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From End of Hardstand 8 to Turbine 8	1.00	6.95	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Junction for Turbine 8 to Chainage 4200 m	1.62	6.40	Low	Although peat recorded >0.5 m depth, peat slide likelihood

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
				considered to be low and FoS considered the ground to be stable.
Section between Chainage 4200 m and Chainage 4400 m	2.75	4.71	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From End of Hardstand 9 to Turbine 9	1.75	5.48	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From Hardstand 9 to 250 m East	1.74	9.95	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
From 250 East of Turbine 9 to Construction Compound	1.81	10.10	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 0 m and Chainage 200 m of HGV	0.00	1.54	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 200 m and Chainage 400 m of HGV	0.00	1.75	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 400 m and Chainage 600 m of HGV	0.00	2.27	Very Low	No peat recorded >0.5 m depth. No mitigation required
From HGV to Construction Compound in South East	0.00	3.41	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 600 m and Chainage 800 m of HGV	0.00	2.70	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 800 m and Chainage 1000 m of HGV	0.00	3.73	Very Low	No peat recorded >0.5 m depth. No mitigation required

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Section between Chainage 1000 m and Chainage 1200 m of HGV	0.07	3.31	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1200 m and Chainage 1400 m of HGV	0.02	3.74	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1400 m and Chainage 1600 m of HGV	0.00	5.38	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1600 m and Chainage 1800 m of HGV	0.00	6.12	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1800 m and Chainage 2000 m of HGV	0.00	5.54	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2000 m and Chainage 2200 m of HGV	0.00	7.09	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2200 m and Chainage 2400 m of HGV	0.05	7.25	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2400 m and Chainage 2600 m of HGV	0.24	5.90	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2600 m and Chainage 2800 m of HGV	0.20	4.95	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2800 m and Chainage 3000 m of HGV	0.07	7.88	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3000 m and Chainage 3200 m of HGV	0.14	9.10	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3200 m and Chainage 3400 m of HGV	0.15	7.91	Very Low	No peat recorded>0.5 m depth. No mitigation required
Section between Chainage 3400 m and Chainage 3600 m of HGV	0.12	5.88	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3600 m and Chainage 3800 m of HGV	0.11	7.48	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3800 m and Chainage 4000 m of HGV	0.10	9.03	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 4000 m and Chainage 4200 m of HGV	0.28	4.84	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 4200 m and Chainage 4400 m of HGV	0.18	7.06	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 4400 m and Chainage 4600 m of HGV	0.28	4.91	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 4600 m and Chainage 4800 m of HGV	0.22	4.99	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 4800 m and Chainage 5000 m of HGV	0.14	13.67	Very Low	No peat recorded >0.5 m depth. No mitigation required

Table 9.7.12 Risk Level (Likelihood) and Mitigation

Wind Farm Infrastructure

Turbine/ Infrastructure	Peat Depth m (Max)	Slope Angle Deg (Mean)	Risk Level	Comment/Mitigation
Section between Chainage 5000 m and Chainage 5200 m of HGV	0.07	14.22	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 5200 m and Chainage 5400 m of HGV	0.07	8.85	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 5400 m and Chainage 5600 m of HGV	0.11	5.73	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 5600 m and Chainage 5800 m of HGV	0.00	9.74	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 5800 m and Chainage 6000 m of HGV	0.10	9.48	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 6000 m and Chainage 6200 m of HGV	0.07	9.69	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 6200 m and Chainage 6400 m of HGV	0.05	4.36	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 6400 m and Chainage 6600 m of HGV	0.00	4.61	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 6600 m and Chainage 6800 m of HGV	0.00	4.51	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 6800 m and Chainage 7000 m of HGV	0.07	4.23	Very Low	No peat recorded > 0.5 m depth. No mitigation required
Section between Chainage 7000 m and Chainage 7200 m of HGV	0.03	3.66	Very Low	No peat recorded > 0.5 m depth. No mitigation required
Section between Chainage 7200 m and Chainage 7400 m of HGV	0.35	4.46	Very Low	No peat recorded > 0.5 m depth. No mitigation required
Section between Chainage 7400 m and Chainage 7600 m of HGV	0.63	5.57	Low	Although peat recorded > 0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 7600 m and Chainage 7800 m of HGV	2.03	4.38	Low	Although peat recorded > 0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 7800 m and Chainage 8000 m of HGV	1.41	5.24	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 8000 m and Chainage 8200 m of HGV	1.31	7.34	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 8200 m and Chainage 8400 m of HGV	0.33	9.00	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 8400 m and Chainage 8600 m of HGV	0.41	7.29	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 8600 m and Chainage 8800 m of HGV	0.13	7.19	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 8800 m and Chainage 9000 m of HGV	0.23	10.97	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 9000 m and Chainage 9200 m of HGV	0.10	12.33	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 9200 m and Chainage 9400 m of HGV	0.09	13.70	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 9400 m	0.10	10.26	Very Low	No peat recorded >0.5 m depth. No mitigation required

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
and Chainage 9600 m of HGV				
Section between Chainage 9600 m and Chainage 9800 m of HGV	0.03	4.12	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 9800 m and Chainage 10000 m of HGV	0.40	4.78	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 10000 m and Chainage 10200 m of HGV	0.25	5.11	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 10200 m and Chainage 10400 m of HGV	0.33	6.28	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 10400 m and Chainage 10600 m of HGV	1.01	6.56	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 10600 m and Chainage 10800 m of HGV	0.67	5.20	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 10800 m and Chainage 11000 m of HGV	0.52	5.50	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 11000 m and Chainage 11200 m of HGV	1.89	8.22	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.)
Section between Chainage 11200 m and Chainage 11400 m of HGV	1.79	6.59	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 11400 m and Chainage 11600 m of HGV	2.03	8.84	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Section between Chainage 11600 m and Chainage 11700 m of HGV	1.92	5.05	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 0m and Chainage 200 m of SA	0.53	6.44	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable.
Section between Chainage 200 m and Chainage 400 m of SA	0.22	4.12	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 400 m and Chainage 600 m of SA	0.24	3.12	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 600 m and Chainage 800 m of SA	0.23	6.20	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 800 m and Chainage 1000 m of SA	0.25	5.67	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1000 m and Chainage 1200 m of SA	0.46	8.11	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 1200 m and Chainage 1400 m of SA	0.53	8.85	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable
Section between Chainage 1400 m and Chainage 1600 m of SA	0.66	9.21	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable
Section between Chainage 1600 m and Chainage 1800 m of SA	0.60	6.22	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable
Section between Chainage 1800 m and Chainage 2000 m of SA	0.92	8.04	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable

Table 9.7.12 Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Section between Chainage 2000 m and Chainage 2200 m of SA	0.78	7.50	Low	Although peat recorded >0.5 m depth, peat slide likelihood considered to be low and FoS considered the ground to be stable
Section between Chainage 2200 m and Chainage 2400 m of SA	0.32	6.26	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2400 m and Chainage 2600 m of SA	0.29	7.75	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2600 m and Chainage 2800 m of SA	0.32	7.37	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 2800 m and Chainage 3000 m of SA	0.13	7.35	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3000 m and Chainage 3200 m of SA	0.16	6.44	Very Low	No peat recorded >0.5 m depth. No mitigation required
Section between Chainage 3200 m and Chainage 3400 m of SA	0.15	6.18	Very Low	No peat recorded >0.5 m depth. No mitigation required

9.7.6.3 For comments referring to Factor of Safety, refer to Figure 9.7.6. For comments referring to Peat Slide Likelihood, refer to Figure 9.7.8.

9.7.6.4 Table 9.3.13 shows all the moderate and high-risk infrastructure elements.

Table 9.3.13: Moderate (Likelihood) and Mitigation Elements				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
Turbine Locations				
Turbine 3	1.90	7.00	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Turbine 4	2.20	6.39	Moderate	Moderate risk level based upon marginally unstable ground in FoS.

Table 9.3.13: Moderate (Likelihood) and Mitigation Elements				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
				(Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Internal Tracks Heavy Goods Vehicle = HGV, Light Goods Vehicle = LGV and Substation Access = SA.				
From Start of Turbine 3 to End of Hardstand 3	1.57	10.15	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
End of Hardstand 3 to Chainage 1400 m	2.00	16.08	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 1400 m and Chainage 1600 m	2.52	12.00	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Junction to Turbine 4	2.50	6.89	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 3200 m and Chainage 3400 m	2.92	5.73	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Chainage 3400m to Junction near Turbine 6	3.38	4.15	Moderate	High risk level area situated 20 m North-East of existing track based upon unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
End of Hardstand 7 to Turbine 7	1.79	7.18	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
From Junction for Turbine 7 to Junction for Turbine 8	1.93	8.07	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 7800 m and Chainage 8000 m of Access Route	1.41	5.24	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 8000 m	1.31	7.34	Moderate	Moderate risk level based upon marginally unstable ground in FoS.

Table 9.3.13: Moderate (Likelihood) and Mitigation Elements				
Wind Farm Infrastructure				
Turbine/ Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment/Mitigation**
and Chainage 8200 m of Access Route				(Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.
Section between Chainage 11400 m and Chainage 11600 m of Access Route	2.03	8.84	Moderate	Moderate risk level based upon marginally unstable ground in FoS. (Refer to specific mitigation measures, Section 9.7.8). Peat slide likelihood is low.

Results

9.7.6.5 The results of the FoS assessment (Figure 9.7.6) and Peat Slide Likelihood Combined Factor Assessment (Figure 9.7.8) indicate that both assessments broadly agree that most of the proposed construction infrastructure location across the Site are considered to be of 'Low' or 'Very Low' likelihood of a peat landslide.

9.7.6.6 Several areas have been assigned a moderate risk level, as per Table 9.3.13. The moderate risk level is associated with the limit equilibrium approach identifying areas of marginal instability, as shown in the FoS assessment Figure 9.7.6. Whilst these areas are shown as low likelihood from the combined factors assessment, the worst-case scenario has been applied.

9.7.6.7 Where moderate risk areas exist, specific mitigation measures as outlined within Section 9.7.8 will need to be applied.

9.7.6.8 In order for there to be a 'High' or 'Medium' risk associated with the Proposed Development, combined peat landslide likelihood must be 'Moderate' or higher at an infrastructure location, as defined by Scottish Government Guidance[1].

9.7.6.9 Where combined peat landslide likelihoods and FoS results are assessed as 'Low' or 'Very Low', post-consent site investigations and application of good practice construction mitigation methods should be employed prior to and during construction as detailed in Section 9.7.8 below. Specific mitigation methods for areas assessed as 'Moderate' likelihood are also detailed in Section 9.7.8.

9.7.7 Consequence Evaluation

9.7.7.1 Based on the assessment of consequence of risk methodology, as defined by the Scottish Government Best Practice Guidance[1], five receptors have been identified at the Site, and are assessed for consequence in Table 9.7.14 below:

- Watercourses;
- Private Water Supplies (PWS);
- Groundwater Dependent Terrestrial Ecosystems (GWDTE) habitats;
- Non-riverine habitats;
- Proposed development infrastructure; and
- Residential properties.

Table 9.7.14: Assessment of Consequence and Risk				
Receptor	**Consequence**	**Score**	**Justification for Score**	**Consequence Scale**
Watercourse – Allt Torran an Tairneanaich National Grid Reference NH 55047 71788	Increased turbidity and acidification, fish kill, blockage of drainage, effects on private water supplies	3	Water Quality, Flood risk and Private water supplies have been assessed within Hydrology Reporting	High
Private Water Supply (PWS) – National Grid Reference NH 56306 68876	Increased turbidity and acidification – effects on water supply	3	Water quality effects, as PWS identified within Hydrology Reporting	High
Residential Receptor – National Grid Reference NH 55722 69054	Medium term loss of residency for local occupants. Significant cost to restore property and temporary accommodation. Possible injury, loss of life to occupants	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to residents' property are less significant	Extremely High
Proposed Development Infrastructure, Hardstanding Turbine 3 - National Grid Reference NH 54062 72579	Damage to infrastructure, possible injury, loss of life	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to infrastructure are less significant	Extremely high
Proposed Development Infrastructure, Hardstanding Turbine 4- National Grid Reference NH 54374 72304	Damage to infrastructure, possible injury, loss of life	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to infrastructure are less significant	Extremely high

9.7.7.2 Thirteen areas of moderate likelihood of peat slide have been identified directly at infrastructure locations; two at turbine hardstanding locations and ten at Internal Track locations. Receptors have been included in Table 9.7.15 below to confirm the evaluation for the level of risk associated with the proposed development.

Table 9.7.15 Risk levels derived from Likelihood vs Consequence

Receptor	Qualitative Likelihood worst case (see Table 8.6.12)	Conse-quence Scale/ Score (See Table 8.6.14)	Risk Level	Minimum Distance to Receptor	Level of Mitigation Required	Risk Level (Post Mitigation)
Watercourse	Moderate	High	Moderate	95 m south of existing Internal Track	Specific mitigation, refer to Section 9.7.8	Low
Private Water Supply (PWS)	Moderate	High	Moderate	1260 m south of intersection of Access Route and SA	Specific mitigation, refer to Section 9.7.8	Low
Proposed Development Infrastructure, Hardstanding Turbine 3	Moderate	Extremely High	Moderate	Underlying area of Hardstanding 3	Specific mitigation, refer to Section 9.7.8	Low
Proposed Development Infrastructure, Hardstanding Turbine 4	Moderate	Extremely High	Moderate	Underlying area of Hardstanding 4	Specific mitigation, refer to Section 9.7.8	Low
Residential Property	Moderate	Extremely High	Moderate	990 m south of intersection of Access Route and SA	Specific mitigation, refer to Section 9.7.8	Low

9.7.7.3 The risk levels identified above for each potential receptor are based on the worst-case likelihood and closest proximity to the receptor. The risk level for these areas is considered to be Moderate for the Watercourse, Private Water Supply, Proposed Development for both Turbine 3 and 4 and the Residential Property, based on:

- proximity of potential for unstable ground from infrastructure location;
- level and slope angle both up and down slope; and
- run out distances to potential receptors (Refer to Figure 9.6.9).

9.7.7.4 Implementing specific mitigation measures would lower the post mitigation risk too low for the receptors identified as moderate risk, Section 9.7.8.

9.7.7.5 Whilst the FoS assessment has been undertaken using conservative representative values within the assessment, several peat exposures were noted on Site near existing infrastructure locations. These exposures were formed during the original construction of the windfarm and show only marginal localised instability (peat debris from vertical face, Photograph 1).

Photograph 1: Peat exposure showing localised instability, approximately 2.5 m height



9.7.7.6 This may suggest that the values within the FoS assessment are potentially overly conservative and therefore we recommend that these values are reassessed following post consent ground investigation.

9.7.7.7 It is also noted that there are several areas of marginal instability under existing Internal Tracks. This would suggest that the peat has potentially been removed during original construction. Existing Internal Tracks would require modification/widening which would require the removal of any peat.

9.7.7.8 Based on the combined Qualitative likelihood vs Consequence and the findings within the FoS assessment previously outlined, the combined risk level of peat landslide in association with the construction of the Proposed Development is assessed as being Low risk. This assessment of Risk level is based on Low likelihood or Moderate Likelihood vs High or Extremely High consequence as outlined in ECU best practice guidance[21], as shown in Table 9.6.16.

[21] Energy Consents Unit Scottish Government (2017), Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments – Second Edition.

Table 9.6.16 Indicative Risk Level

Peat Landslide Probability or Likelihood	Receptor	Adverse Consequence: Extremely High	High	Moderate	Low	Very Low
	Very High (Almost certain)	High	High	Moderate	Moderate	Low
	High (Probable)	High	Moderate	Moderate	Low	Negligible
	Moderate (Likely)	Moderate	Moderate	Low	Low	Negligible
	Low (Unlikely)	Low	Low	Low	Negligible	Negligible
	Very Low (Negligible)	Low	Negligible	Negligible	Negligible	Negligible

9.7.8 Mitigation Measures

9.7.8.1 The following infrastructure elements have been identified as a moderate risk based on the FoS assessment:

- Turbines
- Turbine 3 (hardstanding); and
- Turbine 4 (hardstanding).
- Internal Tracks
- From Start of Turbine 3 to End of Hardstand 3;
- End of Hardstand 3 to Chainage 1400 m;
- Section between Chainage 1400 m and Chainage 1600 m;
- From Junction to Turbine 4;
- Section between Chainage 3200 m and Chainage 3400 m;
- From Chainage 3400 m to Junction near Turbine 6;
- End of Hardstand 7 to Turbine 7;
- From Junction for Turbine 7 to Junction for Turbine 8;
- Section between Chainage 7800 m and Chainage 8000 m of Access Route;
- Section between Chainage 8000 m and Chainage 8200 m of Access Route; and
- Section between Chainage 11400 m and Chainage 11600 m of Access Route.

Specific Mitigation Measures

9.7.8.2 Micrositing of infrastructure following additional post-consent ground investigation and detailed design to reduce potential risk associated with construction in areas of moderate risk should be considered. Where micrositing is not practicable then excavation of the peat will be required to mitigate the potential risk.

9.7.8.3 General good practice should be applied across the Site to engender awareness of peat instability and enable early identification of potential displacements and opportunities for mitigation.

9.7.8.4 Between Chainage 3,400 m to the junction near Turbine 6 the FoS assessment (Figure 9.6.6) a small area of unstable ground is shown 25 m northeast of the existing Internal Track. As such it is considered that the use of good practice mitigation would be sufficient to mitigate any potential risk based on the Internal Track being locally modified.

General Mitigation Measures

9.7.8.5 A comprehensive intrusive geotechnical assessment would be undertaken post-consent based on the combined ground investigation, to support the engineering design of turbine foundations, tracks and ancillary infrastructure for the Proposed Development.

9.7.8.6 Appropriate field and laboratory testing would also be undertaken as part of the comprehensive ground investigation to confirm the peat stability baseline across the Site to cover the areas affected by the Internal Tracks and ancillary infrastructure, and further design mitigation used as appropriate to reduce the likelihood of peat instability (where required).

9.7.8.7 A geotechnical risk register would be prepared detailing any ground risks identified during the ground investigation and providing mitigation measures as appropriate. The risk register should be considered a live document and updated throughout the phases of the Proposed Development. The monitoring requirements discussed in the following paragraphs would be undertaken by the Applicant's contractor.

9.7.8.8 During construction of the Proposed Development the following mitigation would be undertaken for excavations:

- A geotechnical risk register would be prepared for the Proposed Development following intrusive investigations post consent and location specific stability analyses;
- Site inspections and audits would be undertaken at scheduled intervals to identify any unusual or unexpected changes to ground conditions (which may be associated with construction, or which may occur independently of construction);
- All construction activities and operational decisions that involve disturbance to peat deposits would be overseen by an appropriately qualified geotechnical engineer with experience of construction on peat sites;
- Awareness of peat instability and pre-failure indicators would be incorporated into site induction, tool box talks, and training to enable all site personnel to recognise ground disturbances and features indicative of incipient instability;
- Monitoring checklists would be prepared with respect to peat instability addressing all construction activities forming the Proposed Development;
- Use of appropriate supporting structures around peat excavations, where required, (e.g. for towers, crane pads and compounds) to prevent collapse and the development of tension cracks;
- Avoid cutting trenches or aligning excavations across slopes (which may act as incipient back scars for peat failures) unless appropriate mitigation has been put in place;
- Implement methods of working that minimise the cutting of the toes of slope, e.g. working up-to-downslope during excavation works;
- Monitor the ground upslope of excavation works for creep, heave, displacement, tension cracks, subsidence or changes in surface water content;
- Monitor cut faces for changes in water discharge, particularly at the peat-substrate contact; and

- Minimise the effects of construction on natural drainage by ensuring natural drainage pathways are maintained or diverted such that there is no significant alteration of the hydrological regime of the Site; drainage plans should avoid creating drainage/infiltration areas or settlement ponds towards the tops of slopes (where they may act to both load the slope and elevate pore pressures).

9.7.8.9 During construction of the Proposed Development the following mitigation would be undertaken for excavated Internal Tracks:

- Maintain drainage pathways through tracks to avoid ponding of water upslope;
- Monitor the top line of excavated peat deposits for deformation post-excavation; and
- Monitor the effectiveness of cross-track drainage to ensure it water remains free-flowing and that no blockages have occurred.

9.7.8.10 During construction of the Proposed Development the following mitigation would be undertaken for temporary storage of peat and restoration activities:

- Where practicable, ensure temporary stores of peat are located on non-peat soils to minimise potential for instability of the underlying soils;
- Avoid storing peat on slope gradients >3° and preferably store on ground with neutral slopes and natural downslope barriers to peat movement;
- Monitor effects of wetting/re-wetting stored peat on surrounding peat areas, and prevent water build up on the upslope side of peat mounds; and
- Maximise the interval between material deliveries over newly constructed tracks that are still observed to be within the primary consolidation phase.

9.7.8.11 During the operational phase of the Proposed Development monitoring of key infrastructure locations would continue through site walkovers and inspections by the Applicant's maintenance contractor to look for signs of unexpected ground disturbance, including:

- Ponding on the upslope side of infrastructure sites and on the upslope side of Internal Tracks;
- Subsidence and lateral displacement of Internal Tracks;
- Changes in the character of natural or artificial peat drainage within a 50 m buffer strip of Internal Tracks and infrastructure (e.g. development of quaking bog, waterlogging of previously dry drains);
- Blockage or underperformance of the installed Site drainage system;
- Slippage or creep of stored peat deposits (including in restored peat cuttings); and
- Development of tension cracks, compression features, bulging or quaking bog anywhere in a 50 m corridor surrounding the Site of any construction activities or Site works.

9.7.8.12 Monitoring would be undertaken during construction and as part of the commissioning phase the need for on-going monitoring would be reviewed and any ongoing monitoring requirements identified.

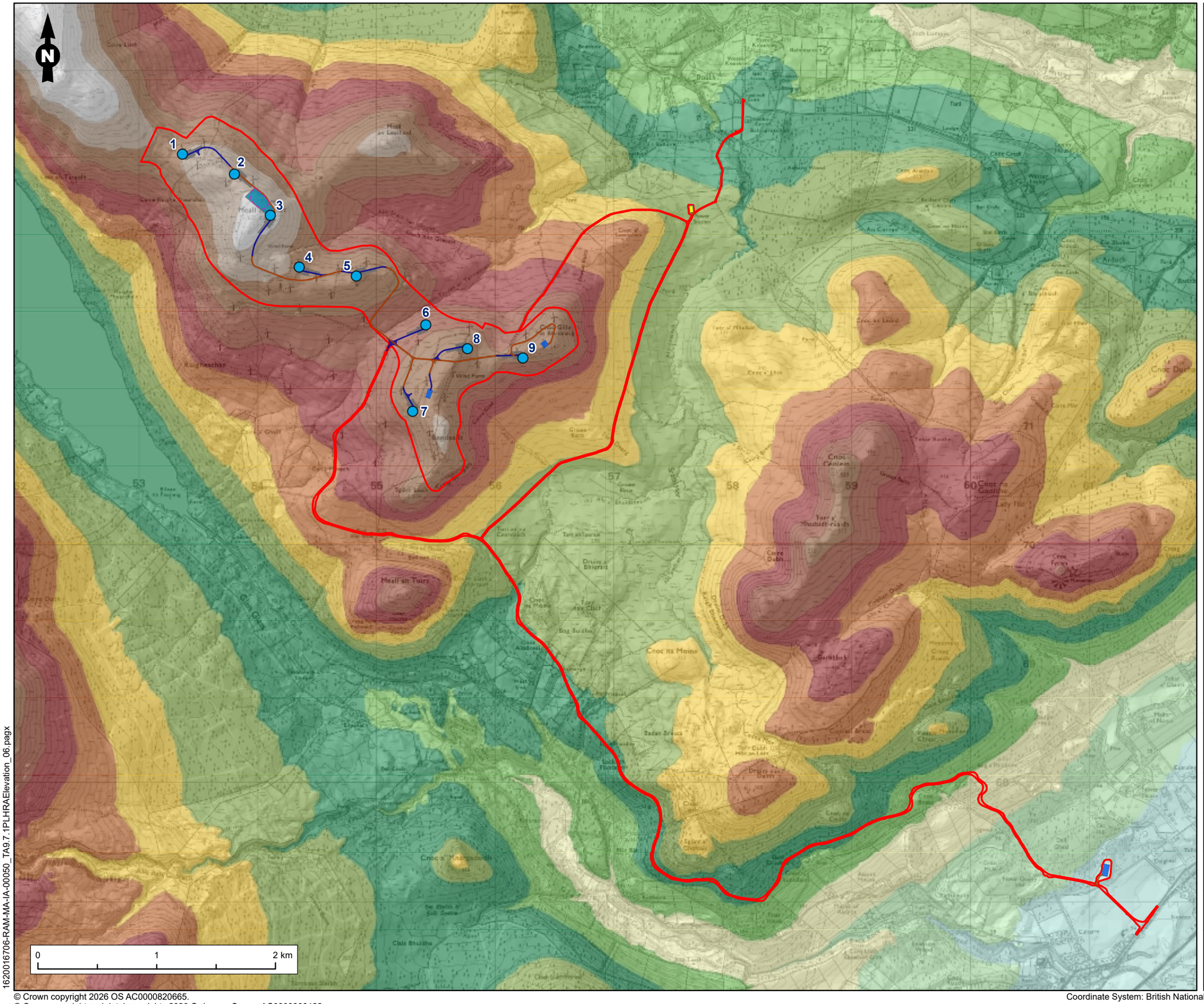
9.7.9 Conclusion

9.7.9.1 The Site is generally considered to be Low or Very Low risk with regards to peat slide risk with the exception of thirteen locations which are considered to be Moderate.

9.7.9.2 It is considered that the general good practice mitigation measures included within Section 9.7.8 of this Technical Appendix would be sufficient to provide mitigation for very low and low risk areas of the Site.

9.7.9.3 For areas of moderate risk, specific mitigation including micrositing or removal of peat should be undertaken following post consent Ground Investigation.

Figures



Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Elevation (mAOD)

- 700.1 - 750
- 650.1 - 700
- 600.1 - 650
- 550.1 - 600
- 500.1 - 550
- 450.1 - 500
- 400.1 - 450
- 350.1 - 400
- 300.1 - 350
- 250.1 - 300
- 200.1 - 250
- 150.1 - 200
- 100.1 - 150
- 50.1 - 100
- 10.2 - 50

Figure Title
Elevation

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.1	1.0

Prepared By	Scale
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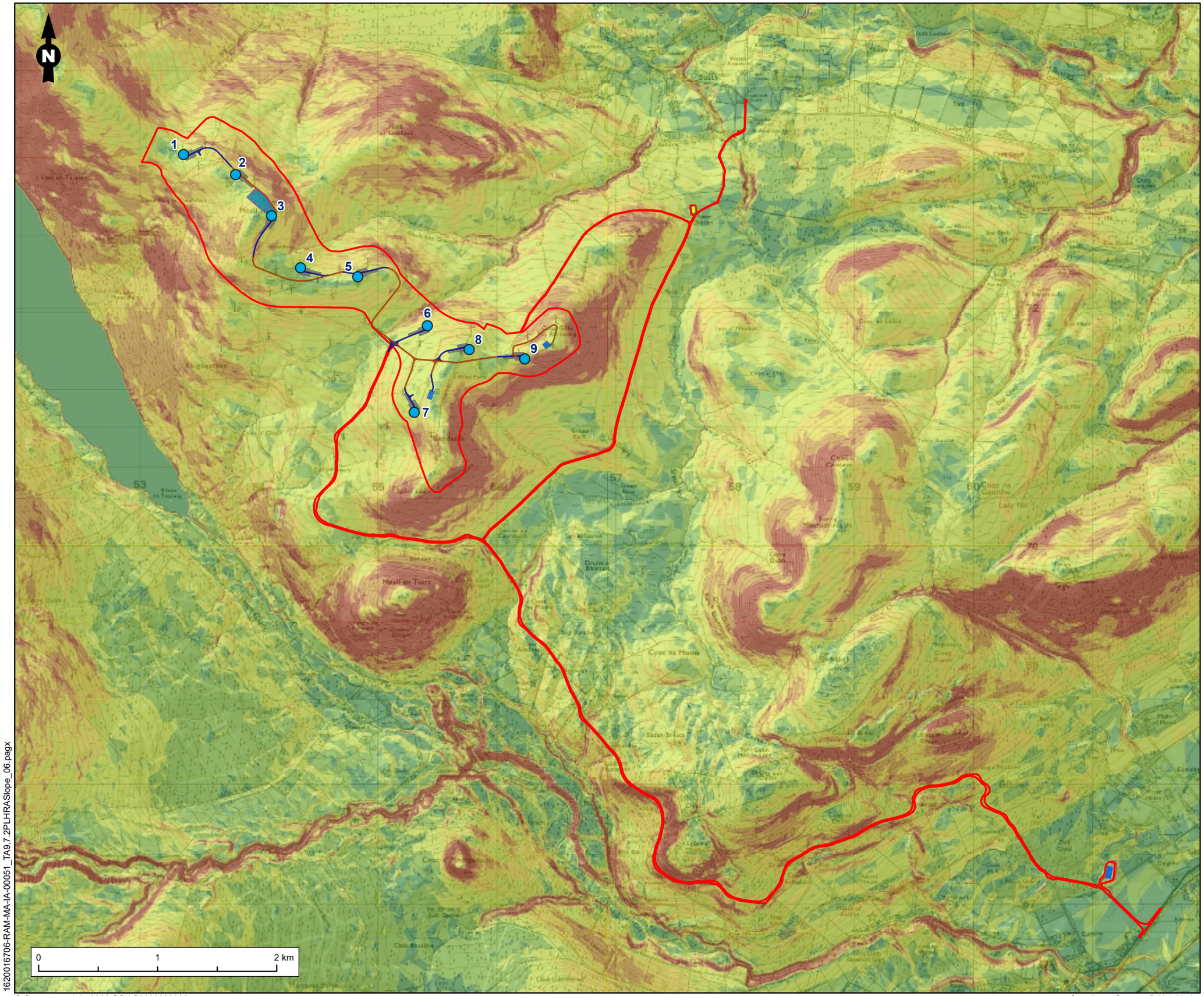
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Slope Angle (Degrees)

- 0.1 - 2
- 2.1 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 90

Figure Title
Slope Angle

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.2	1.0

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Fault Lines (BGS 625k)

- Fault at Rockhead

Bedrock Geology (BGS 625k)

- Middle Old Red Sandstone (Undifferentiated) - Conglomerate, Sandstone, Siltstone and Mudstone
- Lower Old Red Sandstone - Conglomerate, Sandstone, Siltstone and Mudstone
- Glenfinnan Group - Pelite
- Loch Eil Group - Psammite

Figure Title
Bedrock Geology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.3.1	1.0

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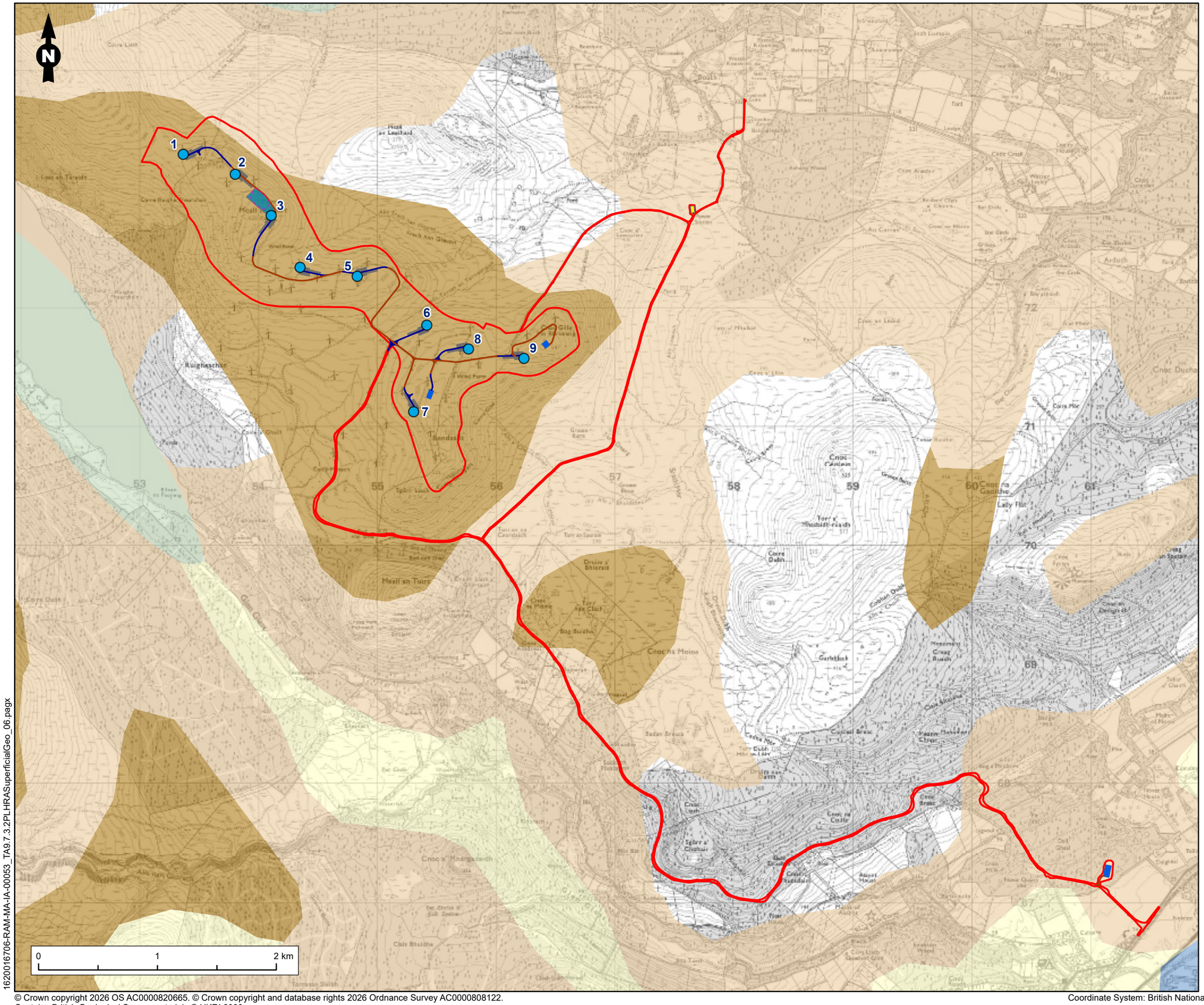
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Superficial Geology (BGS 625k)

- Glacigenic Deposits - Diamicton (Clay, Sand And Gravel)
- Glaciofluvial Deposits - Sand And Gravel
- Marine and Coastal-Zone Deposits - Sand And Gravel
- Organic Deposits - Peat
- Unknown Deposits

Figure Title
Superficial Geology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.3.2	1.0

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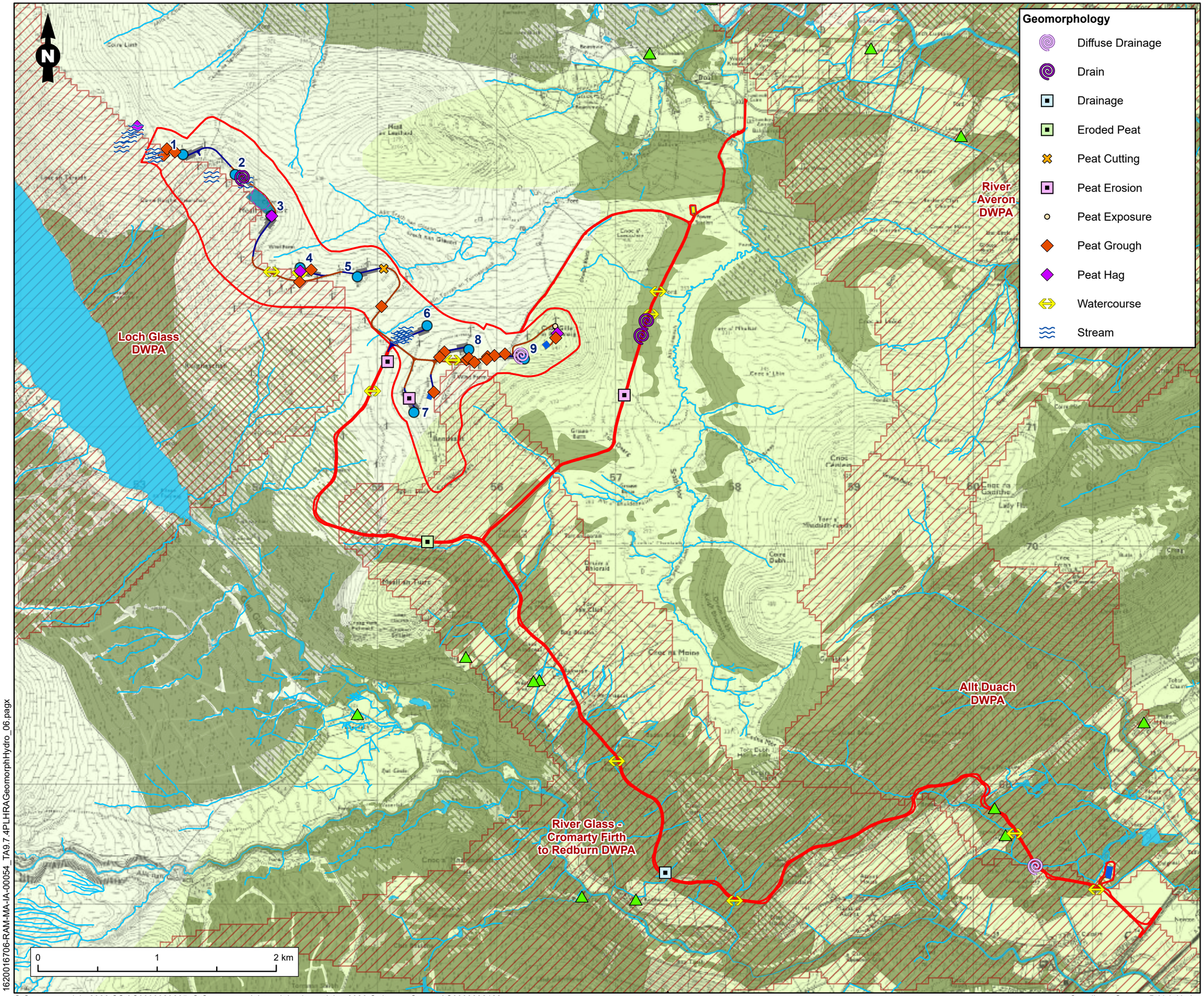
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Geomorphology

- Diffuse Drainage
- Drain
- Drainage
- Eroded Peat
- Peat Cutting
- Peat Erosion
- Peat Exposure
- Peat Grough
- Peat Hag
- Watercourse
- Stream

Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
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- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Aquifer Classification (BGS 625k)

- Moderately Productive Aquifer
- Low Productivity Aquifer

National Forest Inventory 2023

- Woodland
- Felled

Private Water Supply

- Private Water Supply

Surface Water

- Watercourse
- Waterbody
- Drinking Water Protected Area (Catchment)

Figure Title
Geomorphology & Hydrology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.4	1.0

Prepared By	Scale
AB/RD	1:30,000 @A3

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Peat Depth (m)

- No Peat
- 0.01 - 0.20
- 0.21 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00
- 3.01 - 3.55

Interpolated Peat Depth (m)

- No Peat
- 0.01 - 0.20
- 0.21 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00
- 3.01 - 3.55

Figure Title
Peat Depth

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.5.1	1.0

Prepared By	Scale
AB/RD	1:22,000 @A3

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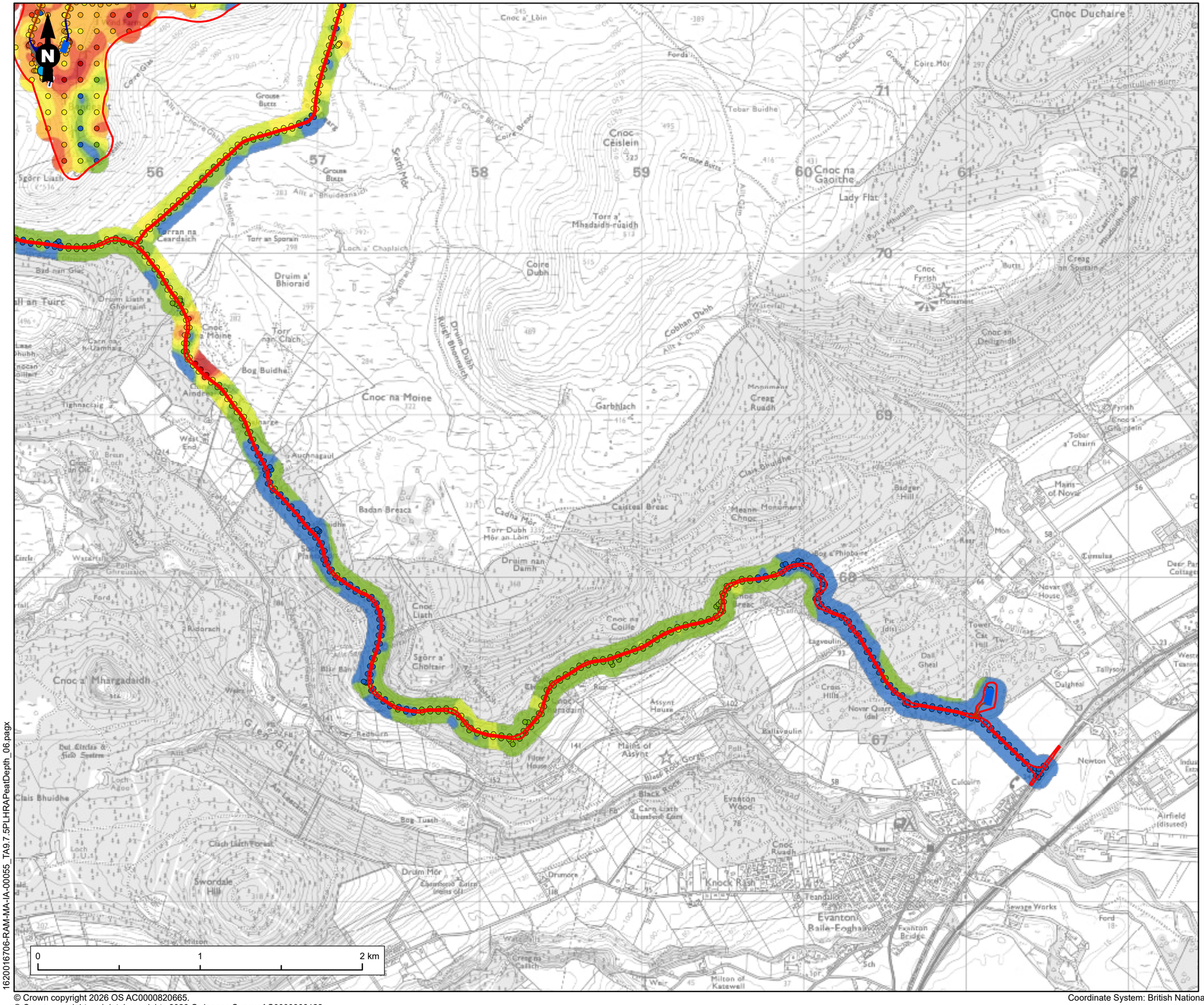
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0 1 2 km

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Construction Compound

Peat Depth (m)

- No Peat
- 0.01 - 0.20
- 0.21 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00

Interpolated Peat Depth (m)

- No Peat
- 0.01 - 0.20
- 0.21 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00
- 3.01 - 3.55

Figure Title
Peat Depth

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.5.2	1.0

Prepared By	Scale
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Factor of Safety

- < 1.0 (Unstable)
- 1.0 - 1.4 (Marginally Unstable)
- 1.4 - 2.0 (Stable)
- 2.0 - 3.0 (Stable)
- >3.0 (Stable)

Figure Title
Factor Of Safety

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.6.1	1.0

Prepared By	Scale
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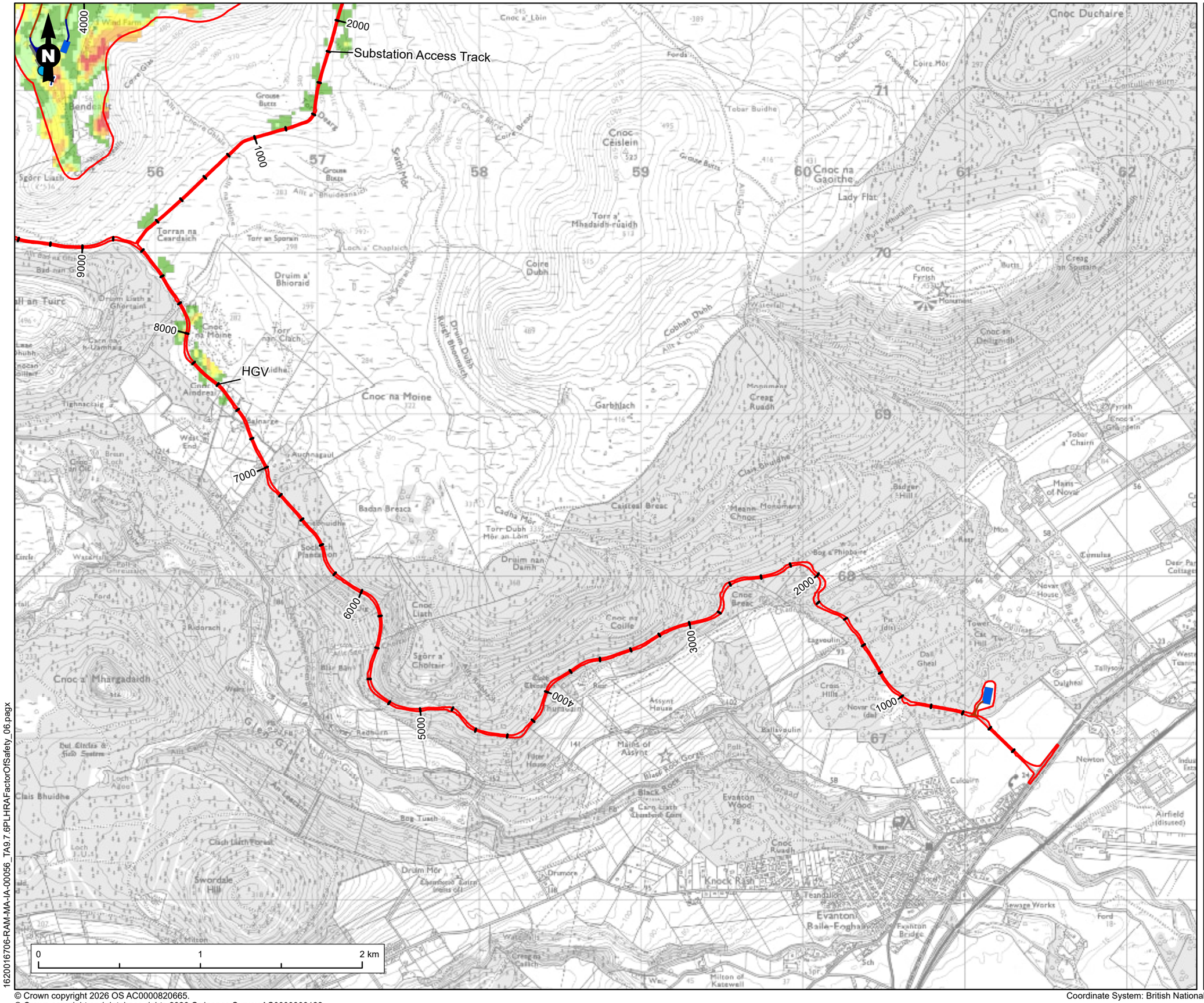
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Construction Compound

Factor of Safety

- < 1.0 (Unstable)
- 1.0 - 1.4 (Marginally Unstable)
- 1.4 - 2.0 (Stable)
- 2.0 - 3.0 (Stable)
- >3.0 (Stable)

Figure Title
Factor Of Safety

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.6.2	1.0

Prepared By	Scale
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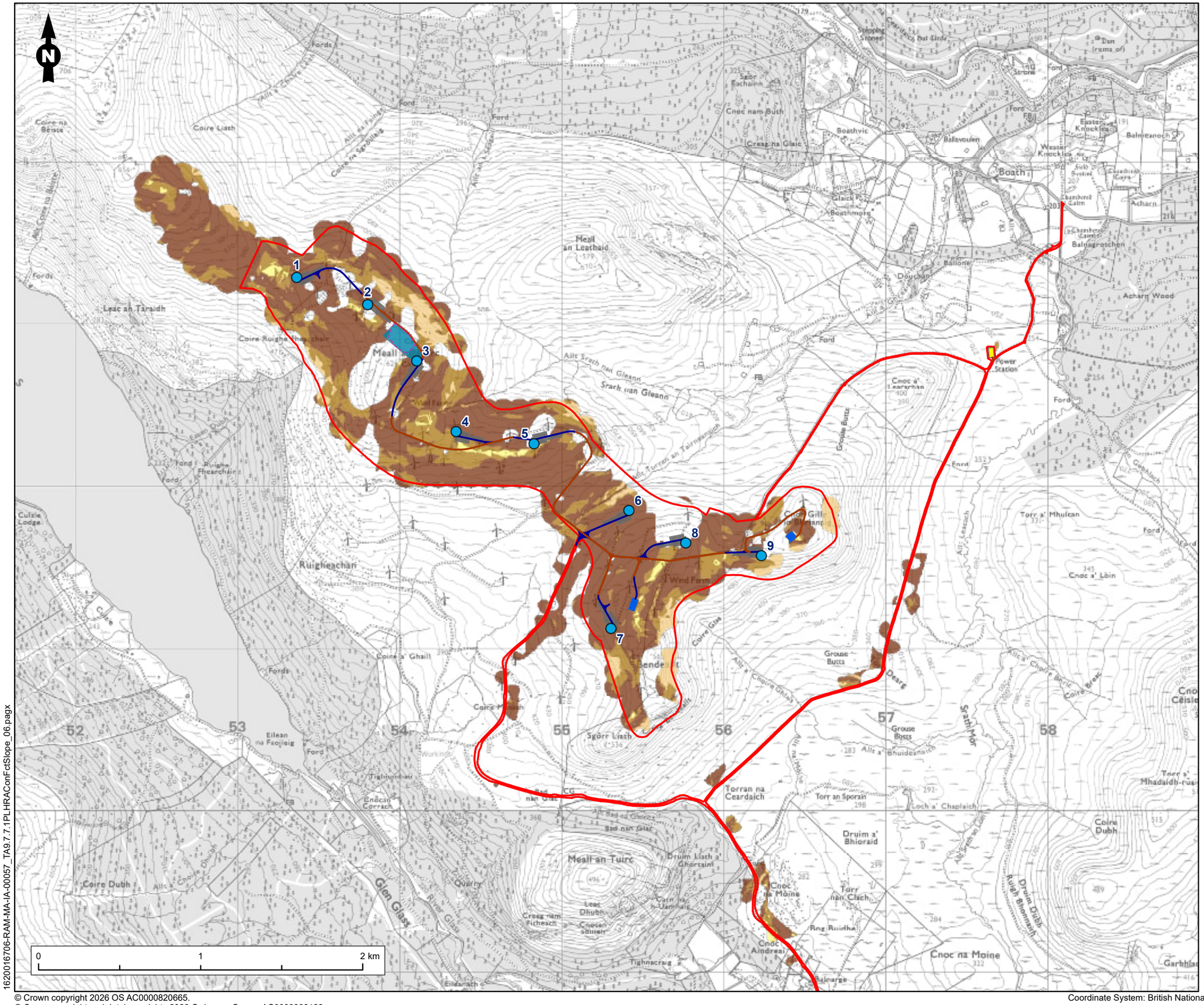
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Slope Angle Scores (S)

- Score 0: <= 2 deg
- Score 1: >20 deg
- Score 2: 2 - 5 deg and 15 - 20 deg
- Score 3: 5 - 15 deg

Figure Title
Contributory Factor: Slope Angle

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.1.1	1.0

Prepared By	Scale
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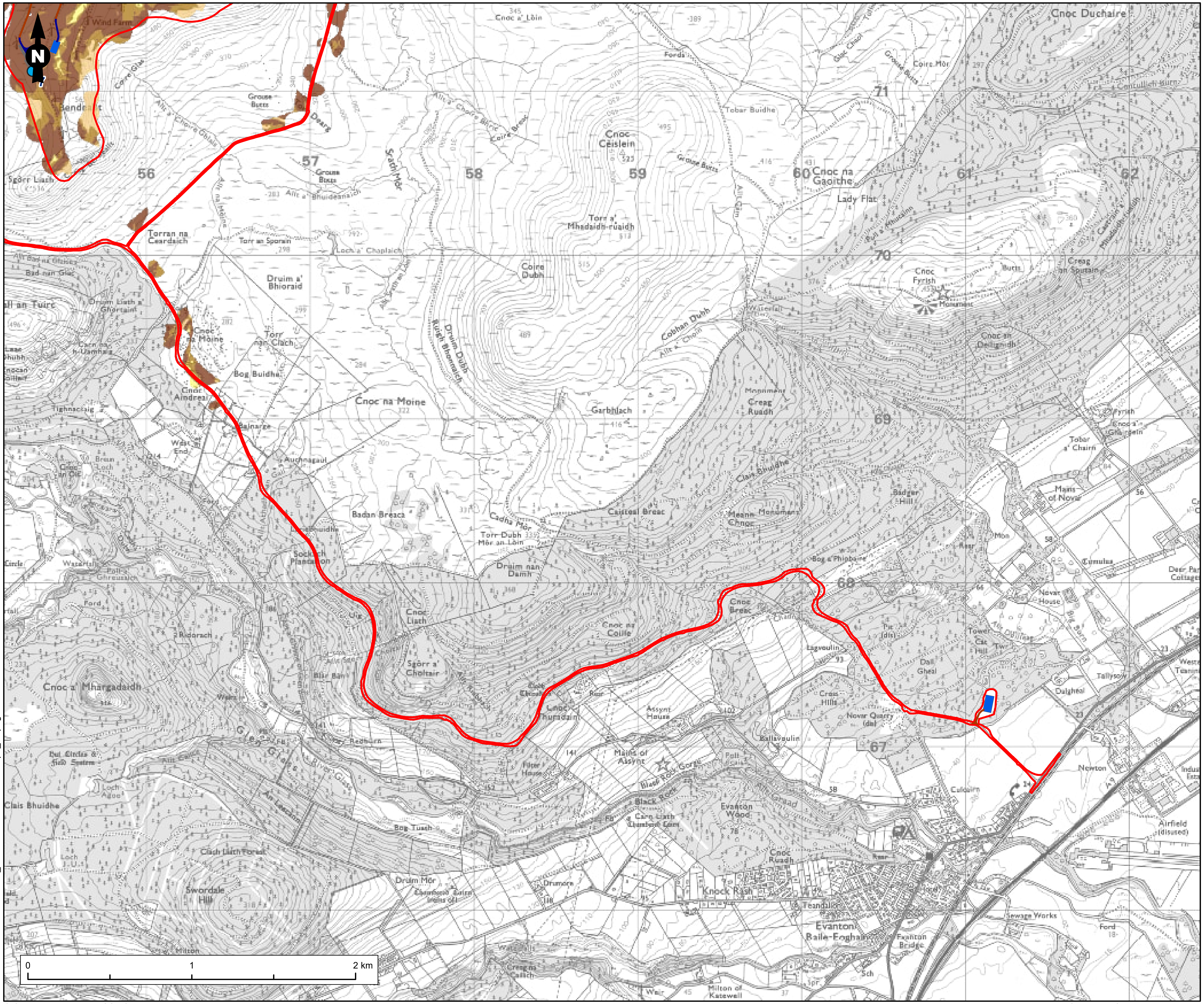
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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Slope Angle Scores (S)

Score 0: <= 2 deg

Score 1: >20 deg

Score 2: 2 - 5 deg and 15 - 20 deg

Score 3: 5 - 15 deg

Figure Title	Contributory Factor: Slope Angle
Project Name	Novar 1 Wind Farm Repowering
Project No./Filery ID	1620016706 / REH2023N04156
Date	September 2026
Figure No.	TA 9.7.7.1.2
Revision	1.0
Prepared By	AB/RD
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Peat Depth Scores (P)

- Score 1: < 0.5 m
- Score 2: >1.5 m
- Score 3: 0.5 - 1.5 m

0 1 2 km

Figure Title
Contributory Factor: Peat Depth

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.2.1	1.0

Prepared By	Scale
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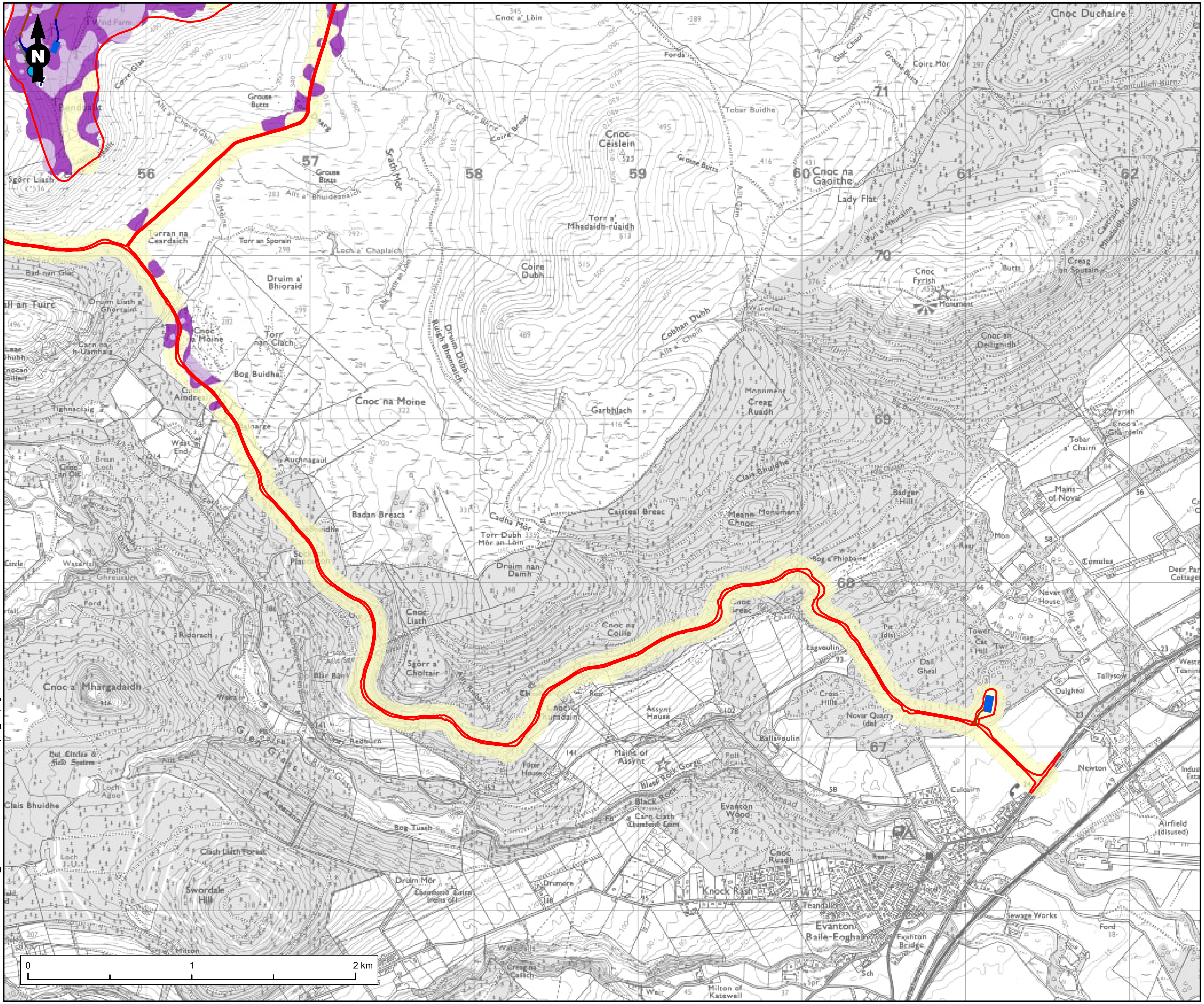
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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Peat Depth Scores (P)

Score 1: < 0.5 m

Score 2: >1.5 m

Score 3: 0.5 - 1.5 m

Figure Title		
Contributory Factor: Peat Depth		
Project Name		
Novar 1 Wind Farm Repowering		
Project No./Filery ID		
1620016706 / REH2023N04156		
Date	Figure No.	Revision
September 2026	TA 9.7.7.2.2	1.0
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Substrate Geology Scores (G)

- Score 1: Impermeable Bedrock
- Score 2: Glacial Till

Figure Title
Contributory Factor: Substrate Geology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.3.1	1.0

Prepared By	Scale
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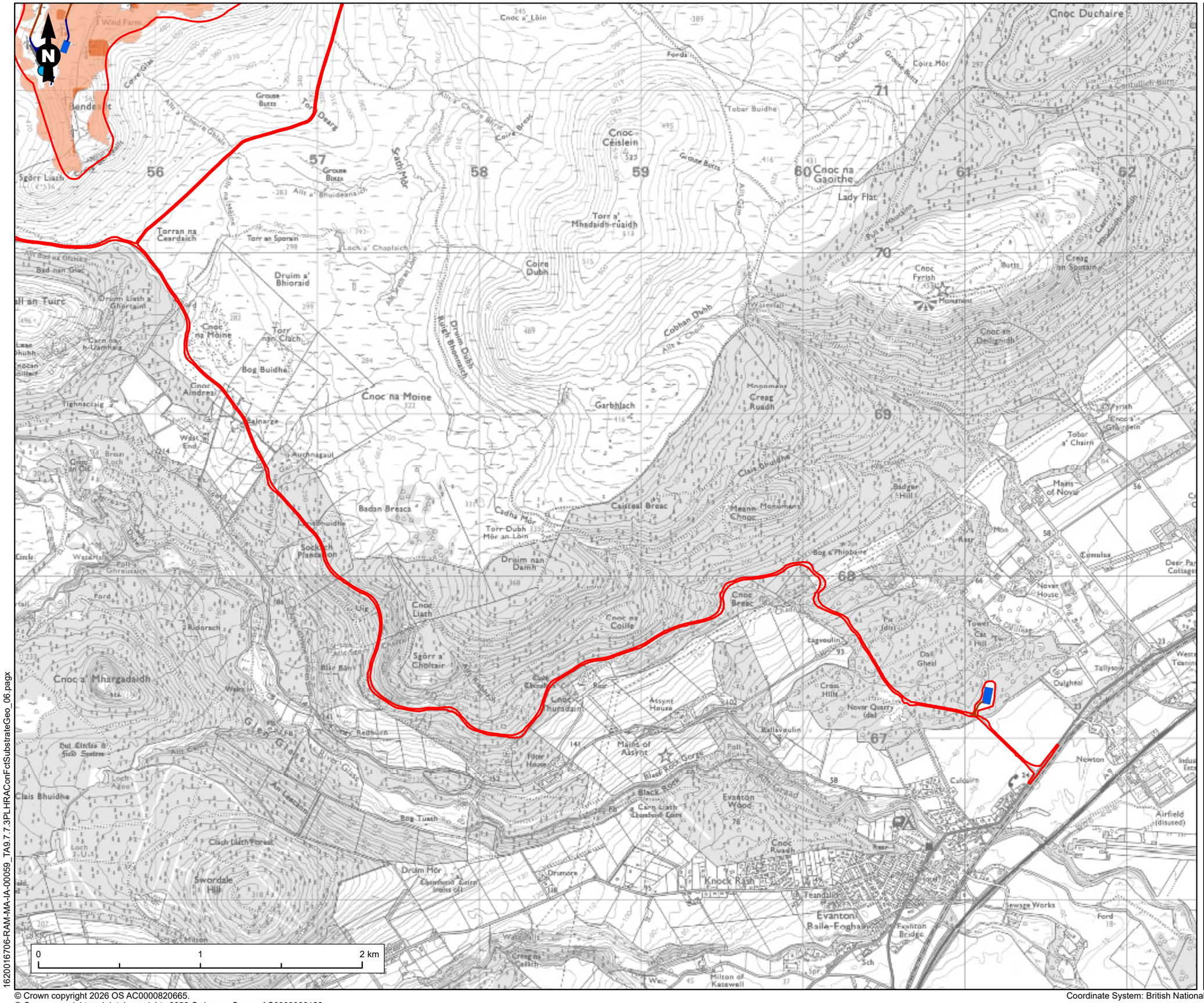
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0 1 2 km

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Construction Compound

Substrate Geology Scores (G)

- Score 1: Impermeable Bedrock
- Score 2: Glacial Till

Figure Title
Contributory Factor: Substrate Geology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.3.2	1.0

Prepared By	Scale
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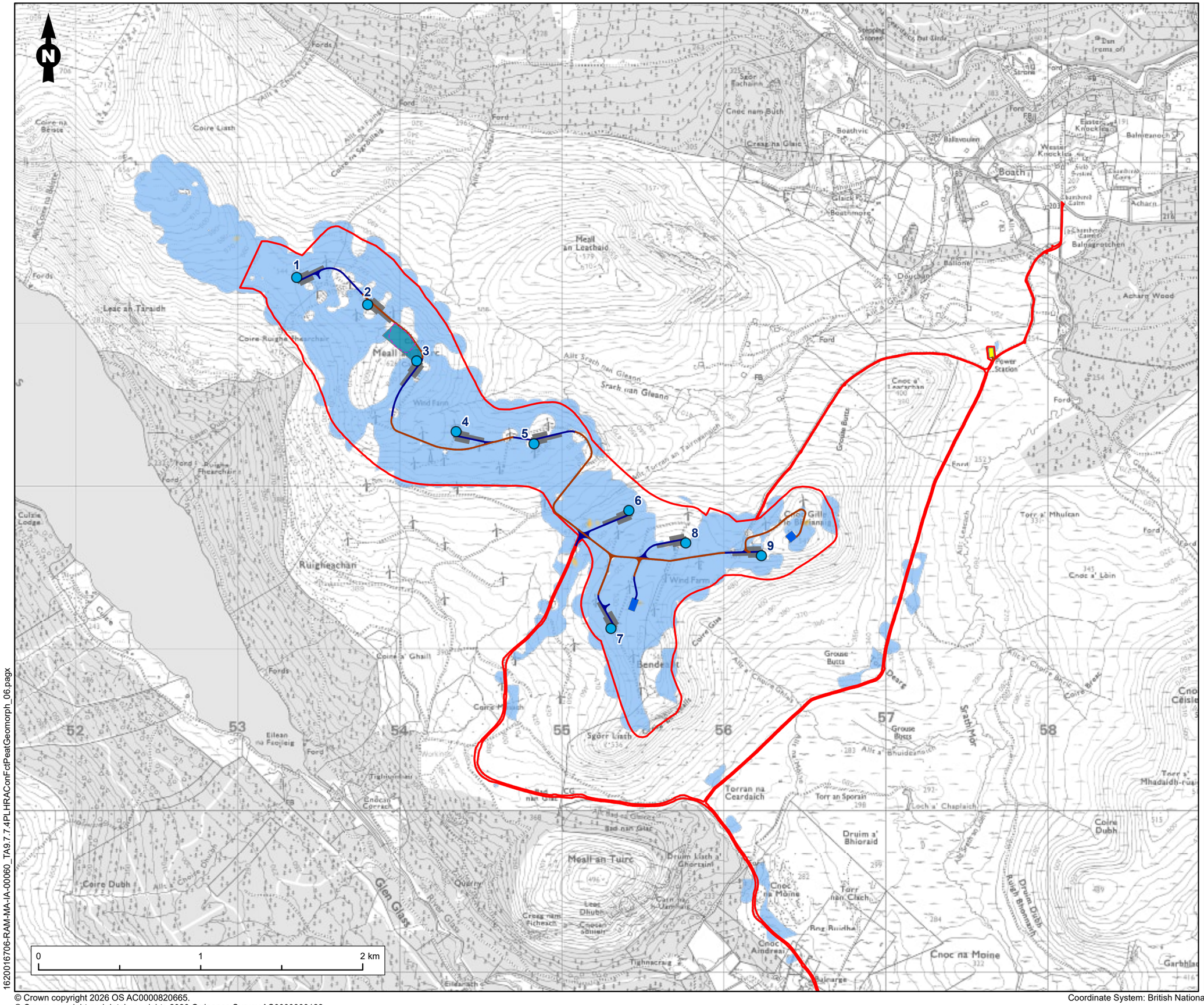
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Peat Geomorphology Scores (M)

- Score 0: No Peat Geomorphology Features Noted
- Score 1: Existing Peat Slide/Hag/ Peat Cutting/Bare Ground

Figure Title
Contributory Factor: Peat Geomorphology

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.4.1	1.0

Prepared By	Scale
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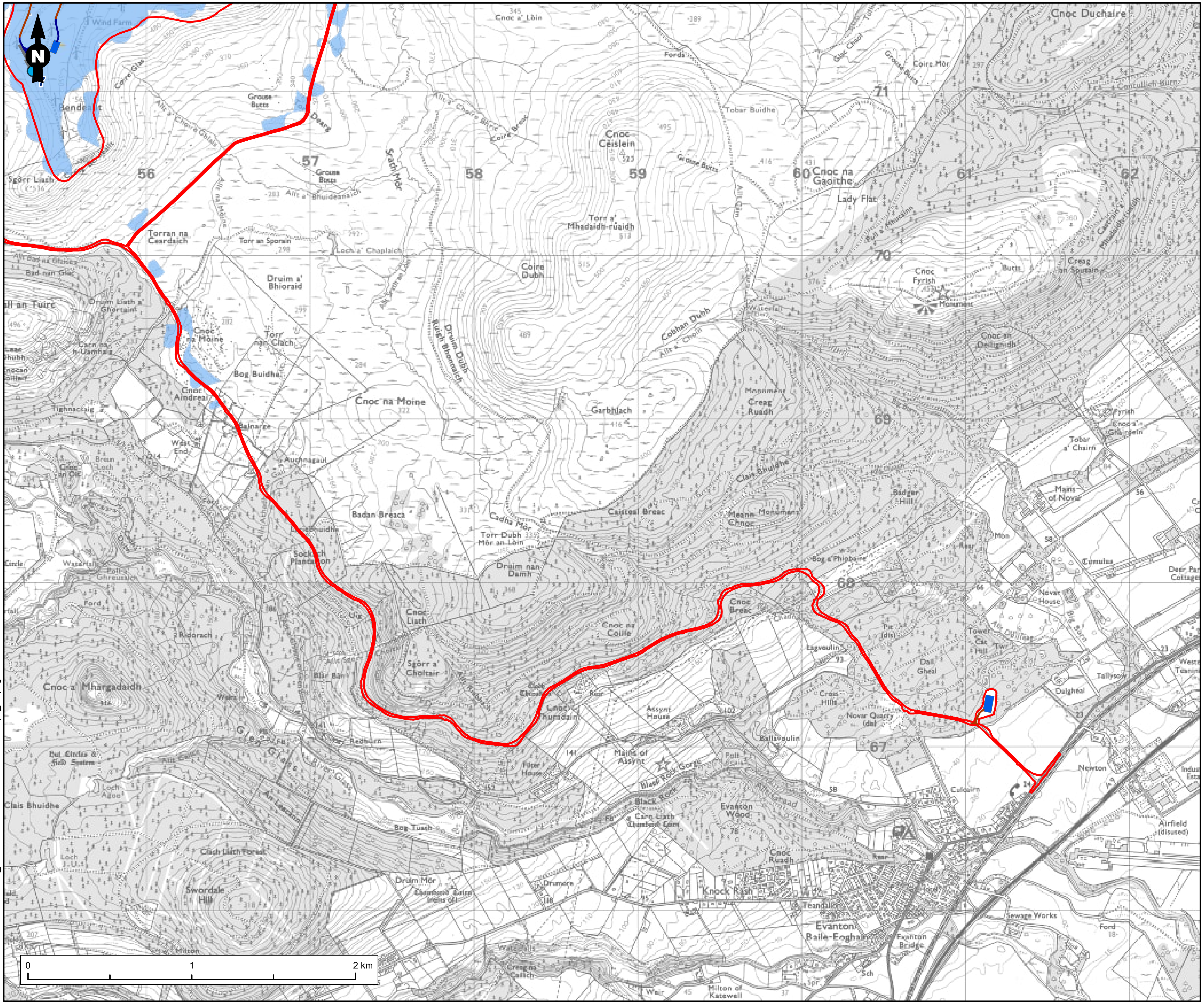
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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Peat Geomorphology Scores (M)

Score 0: No Peat Geomorphology Features Noted

Score 1: Existing Peat Slide/Hag/ Peat Cutting/Bare Ground

Figure Title Contributory Factor: Peat Geomorphology		
Project Name Novar 1 Wind Farm Repowering		
Project No./Filery ID 1620016706 / REH2023N04156		
Date September 2026	Figure No. TA 9.7.7.4.2	Revision 1.0
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Drainage Scores (D)

- Score 0: No Drainage Lines
- Score 1: Drain Aligned to Slope

Figure Title
Contributory Factor: Drainage

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.5.1	1.0

Prepared By	Scale
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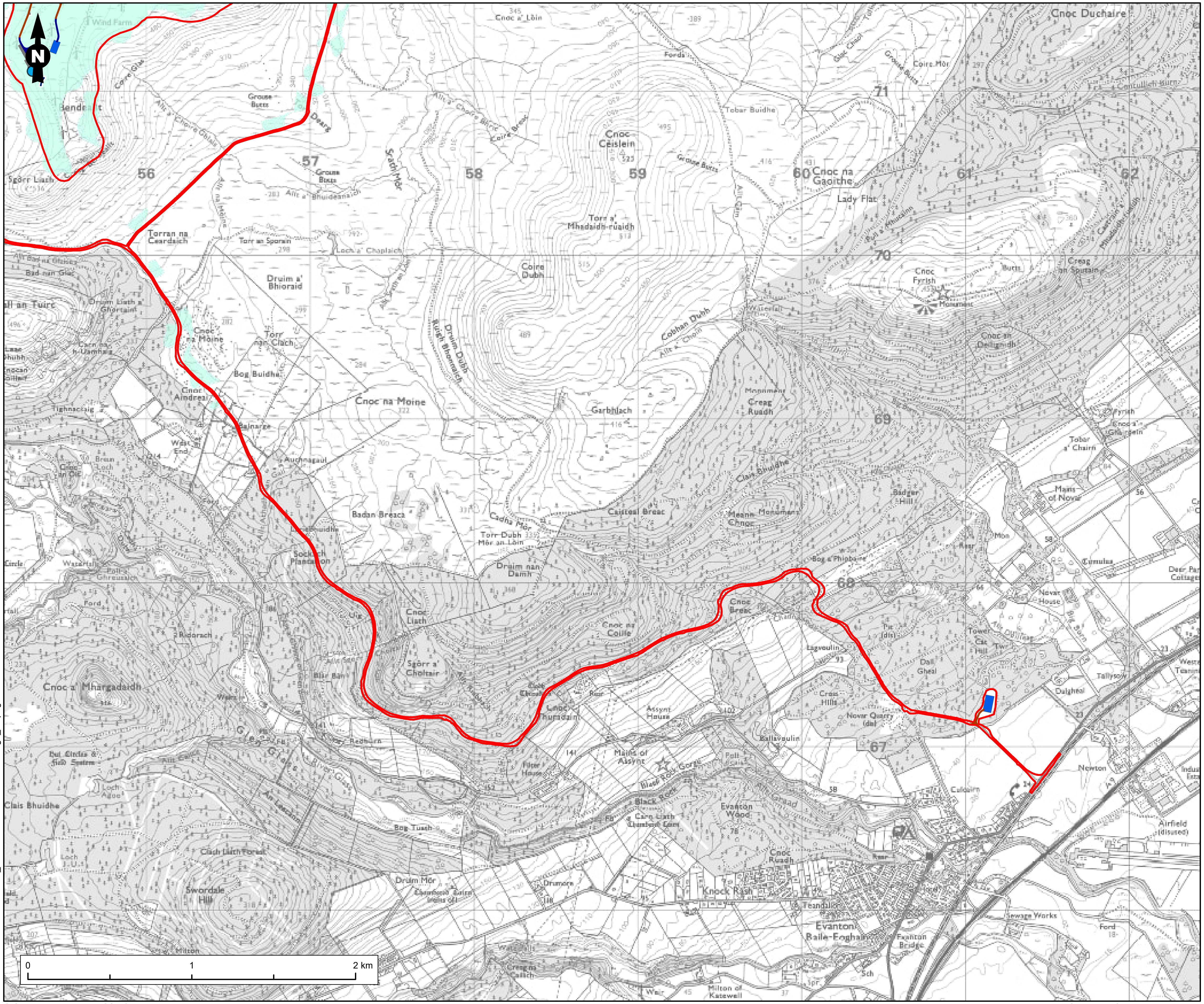
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0 1 2 km

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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Drainage Scores (D)

Score 0: No Drainage Lines

Score 1: Drain Aligned to Slope

Figure Title

Contributory Factor: Drainage

Project Name

Novar 1 Wind Farm Repowering

Project No./Filery ID

1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.5.2	1.0

Prepared By	Scale
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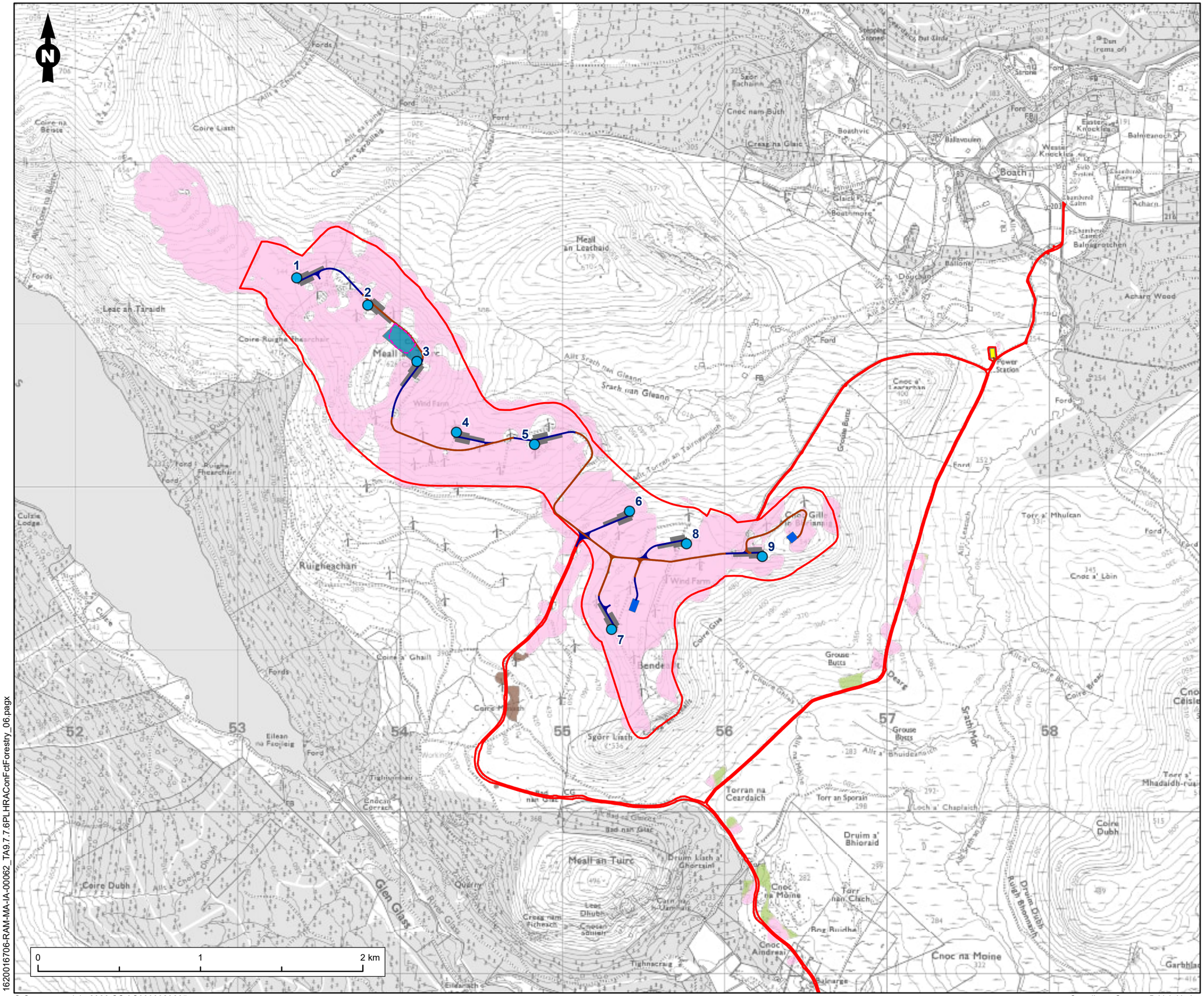
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Forestry Scores (F)

- Score 0: Not afforested
- Score 1: Afforested aligned
- Score 2: Deforested aligned

Figure Title
Contributory Factor: Forestry

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

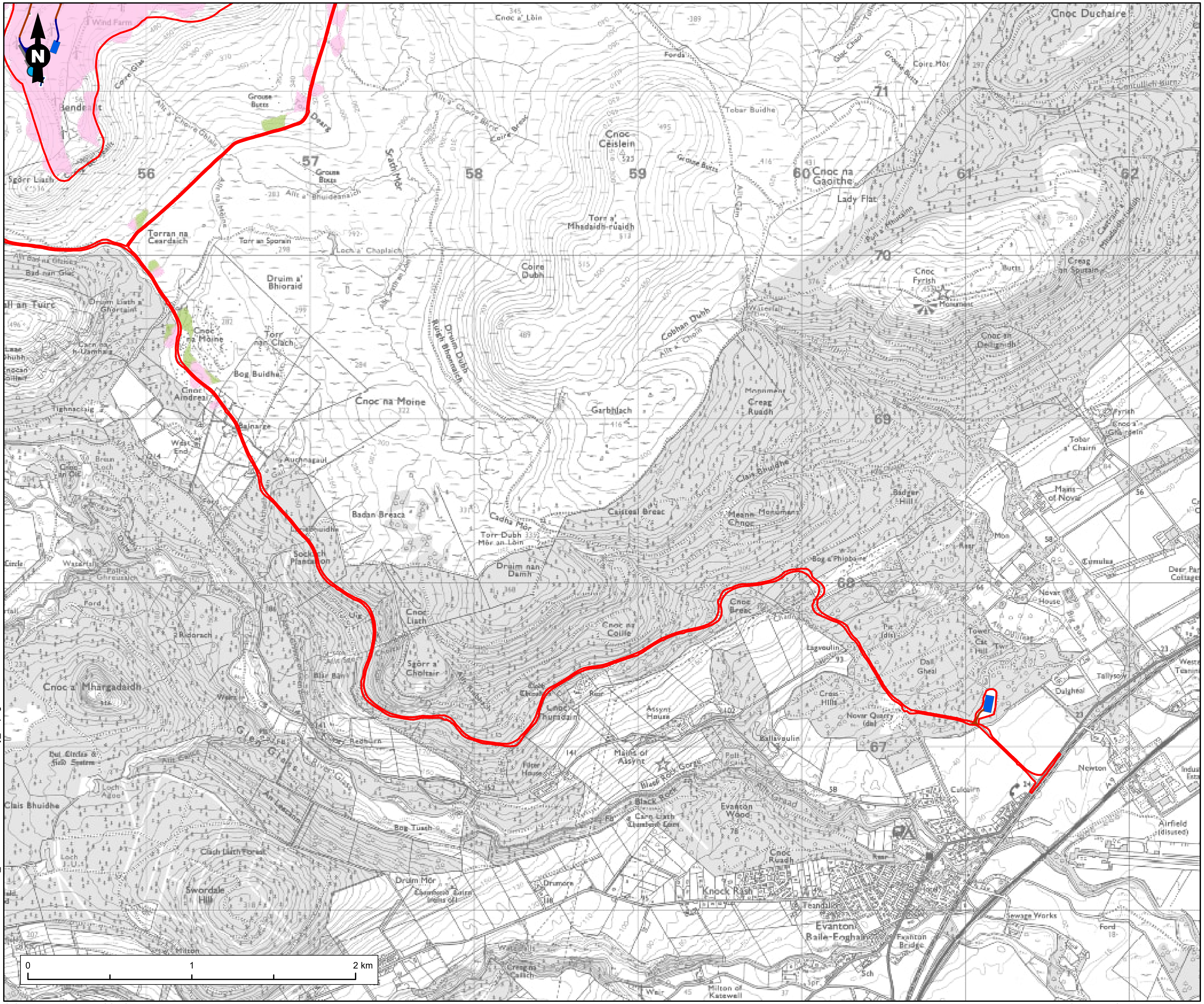
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September 2026	TA 9.7.7.6.1	1.0

Prepared By	Scale
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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Forestry Scores (F)

Score 0: Not afforested

Score 1: Afforested aligned

Figure Title	Contributory Factor: Forestry
Project Name	Novar 1 Wind Farm Repowering
Project No./Filery ID	1620016706 / REH2023N04156
Date	September 2026
Figure No.	TA 9.7.7.6.2
Revision	1.0
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Contributory Factor

- Score 0 : Undulating Ground Slope
- Score 1 : Concave Slope
- Slope 2 : Convex Slope
- Slope 3 : Rectilinear Slope

0 1 2 km

Figure Title
Contributory Factor: Convexity

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.7.1	1.0

Prepared By	Scale
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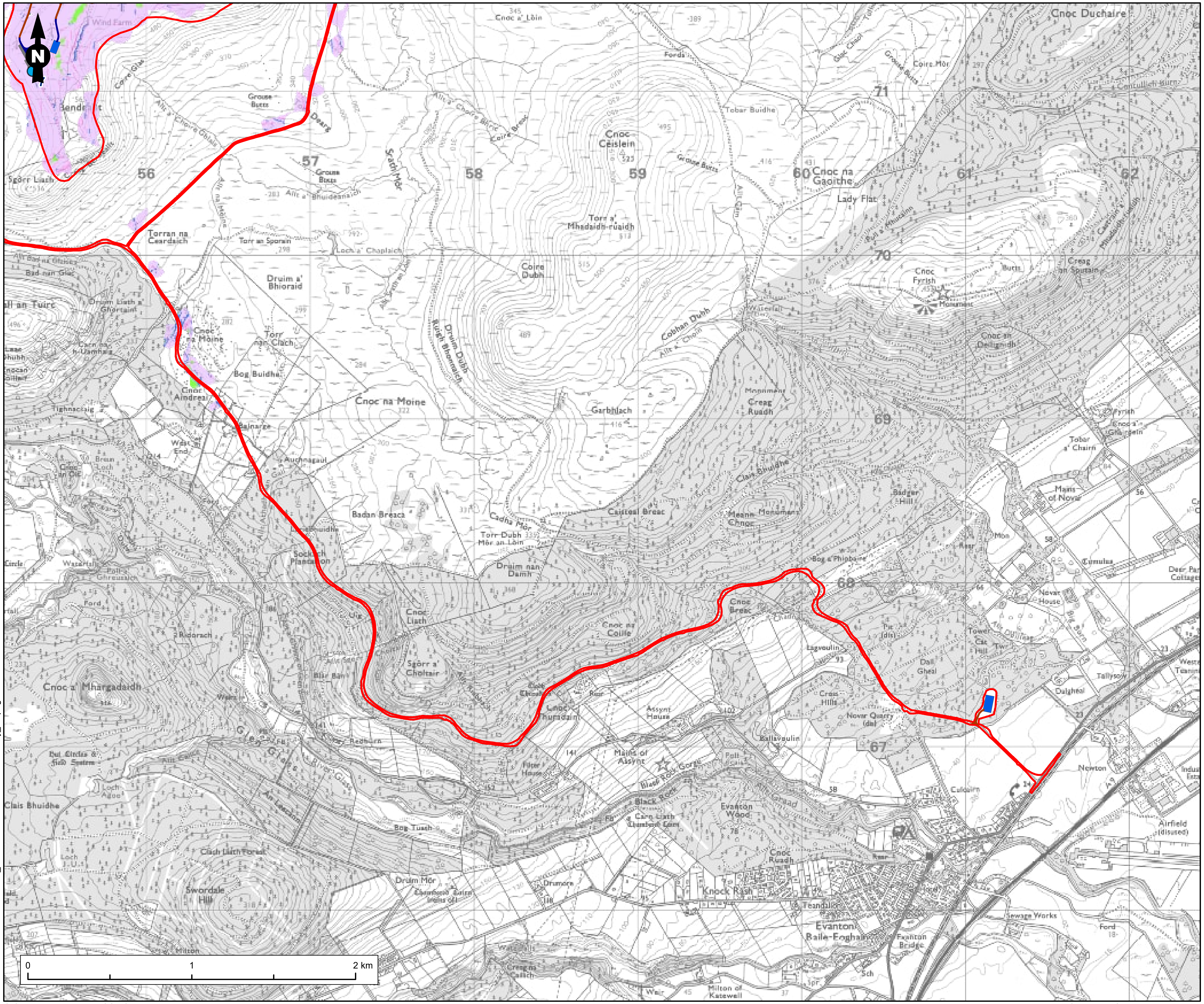
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Legend

Application Boundary

Site Layout

Design Freeze layout

New Tracks

Existing Tracks

Hardstandings

Construction Compound

Contributory Factor

Score 0 : Undulating Ground Slope

Score 1 : Concave Slope

Slope 2 : Convex Slope

Slope 3 : Rectilinear Slope

Figure Title
Contributory Factor: Convexity

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.7.2	1.0

Prepared By	Scale
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Land Use Scores (L)

- Score 0: Other Land Use
- Score 3: Cutting/Turbary

0 1 2 km

Figure Title
Contributory Factor: Land Use

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.8.1	1.0

Prepared By	Scale
AB/RD	1:22,000 @A3

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Construction Compound

Land Use Scores (L)

- Score 0: Other Land Use

Figure Title
Contributory Factor: Land Use

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.7.8.2	1.0

Prepared By	Scale
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0 1 2 km

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Peat Slide Likelihood

- 1) Very Low
- 2) Low (8 - 13)

1
2
3
4
5
6
7
8
9
1000
2000
3000
4000
LGV
LGV
3000
2000
Substation Access Track
1000
11000
HGV
10000
9000
8000
HGV
0
1
2 km

Figure Title
Peat Slide Likelihood

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.8.1	1.0

Prepared By	Scale
AB/RD	1:22,000 @A3

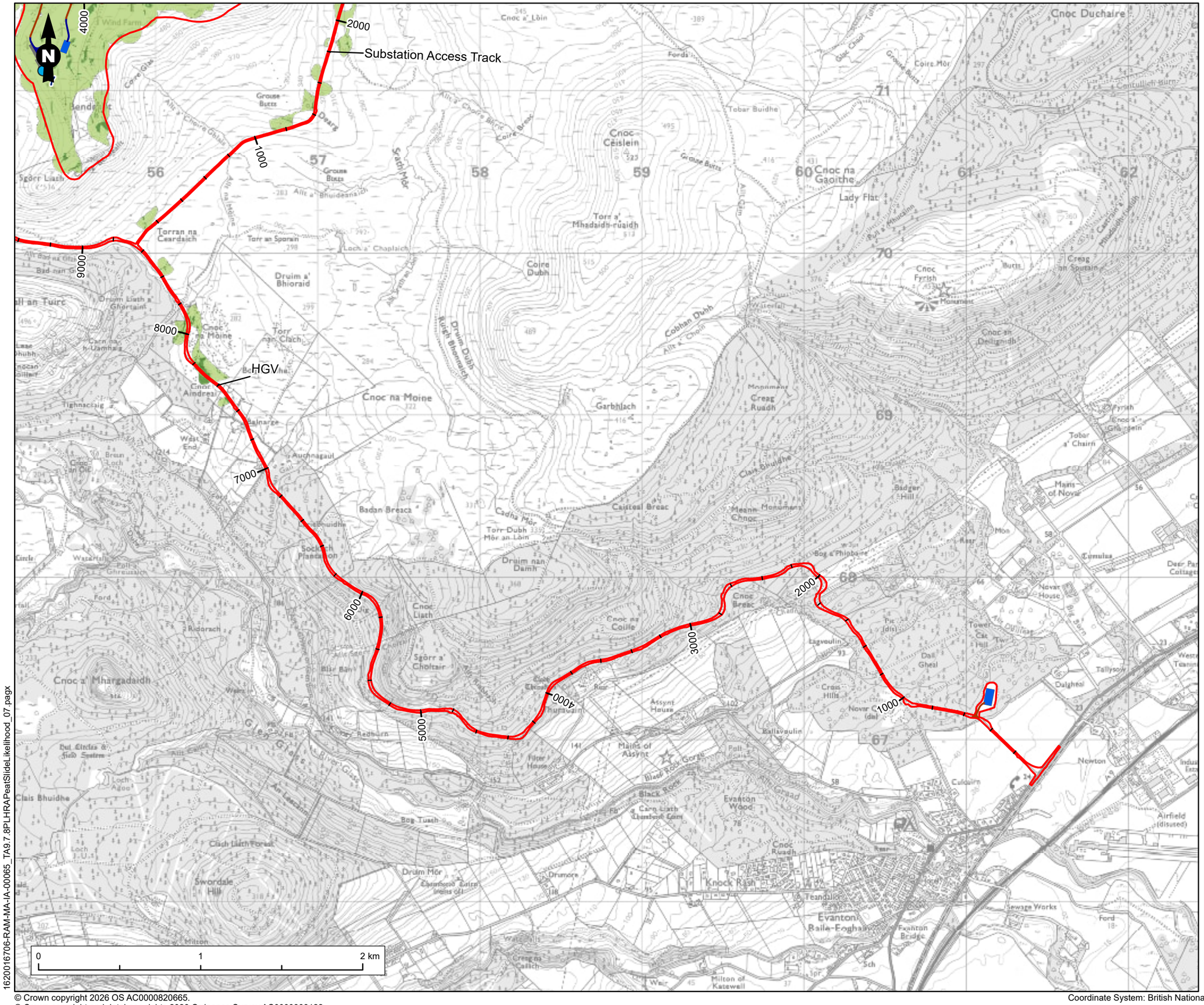
Client
nadara

RAMBOLL

1620016706-RAM-MA-IA-00065_TA9.7.8PLHRAPeatSlideLikelihood_07.pagx

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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Construction Compound

Peat Slide Likelihood

- 1) Very Low
- 2) Low (8 - 13)

Figure Title
Peat Slide Likelihood

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.8.2	1.0

Prepared By	Scale
AB/RD	1:22,000 @A3

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ID	Risk Level	Location	Description
1	Marginally Unstable	95 m South of the Existing Access Track	Watercourse
2	Marginally Unstable	1260 m South of Intersection of HGV and SA	Private Water Supply
3	Marginally Unstable	990 m Southwest of Intersection of HGV and SA	Residential Receptor
4	Marginally Unstable	Underlying Area of Hardstanding 3	Proposed Development
5	Marginally Unstable	Underlying Area of Hardstanding 4	Proposed Development

0 1 2 km

Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Factor of Safety

- < 1.0 (Unstable)
- 1.0 - 1.4 (Marginally Unstable)
- 1.4 - 2.0 (Stable)
- 2.0 - 3.0 (Stable)
- >3.0 (Stable)
- Risk Receptor

Receptors

- Residential Property
- Watercourse
- Waterbody
- Private Water Supply

Figure Title
Distance to Receptors

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.7.9	1.0

Prepared By	Scale
AB/RD	1:22,000 @A3

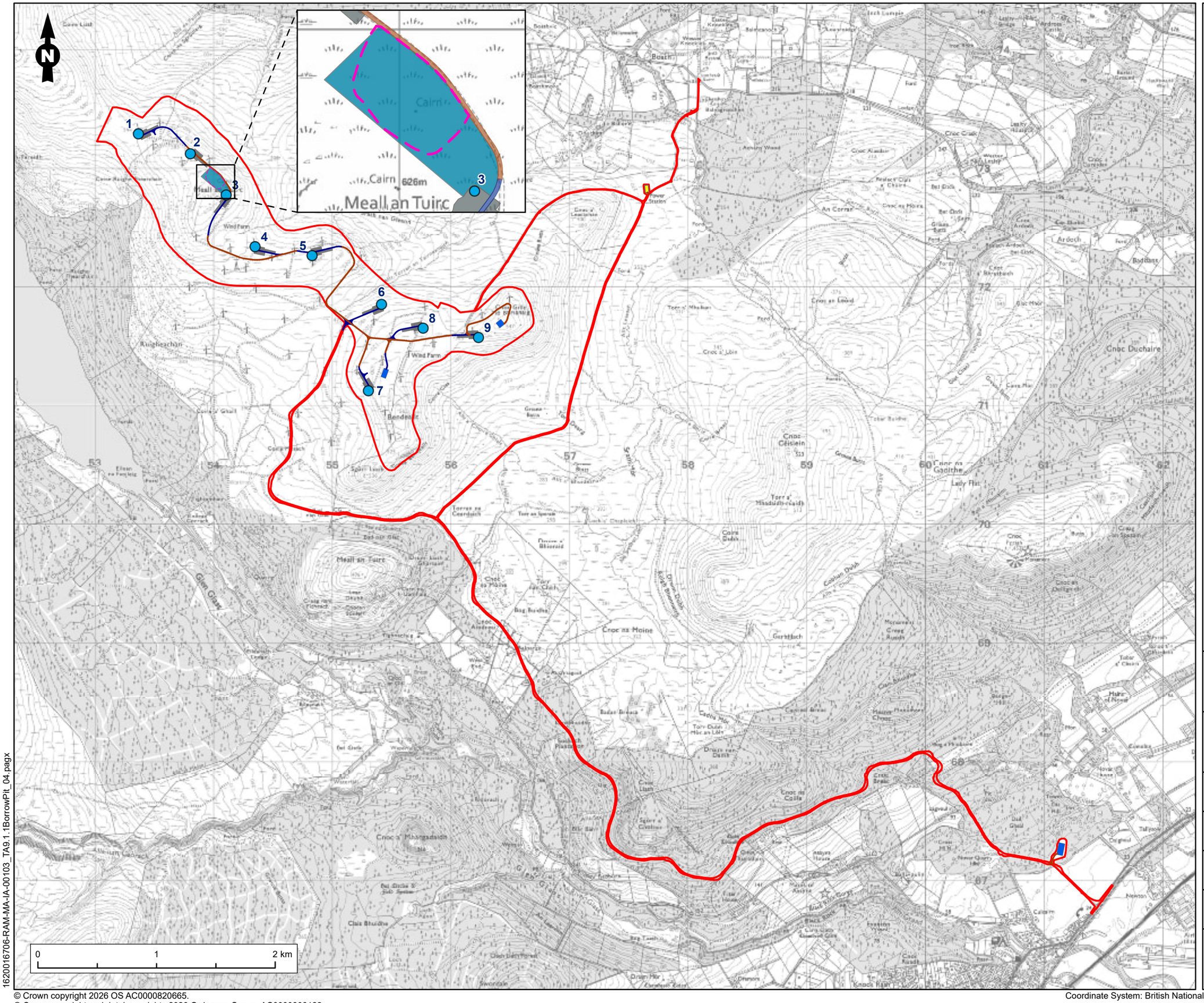
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Legend

- Application Boundary

Site Layout

- Design Freeze layout
- New Tracks
- Existing Tracks
- Hardstandings
- Substation
- Construction Compound
- Borrow Pit Search Area
- Borrow Pit Including Tie In

Figure Title
Borrow Pit Layout

Project Name
Novar 1 Wind Farm Repowering

Project No./Filery ID
1620016706 / REH2023N04156

Date	Figure No.	Revision
September 2026	TA 9.1.1	1.0

Prepared By	Scale
RD	1:30,000 @A3

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