Technical Appendix 10.1: Peat Landslide Hazard Risk Assessment

Cairnoch Hill Wind Farm

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Basis of Report

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1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Eurowind Energy Limited (the 'Applicant') to undertake a Peat Landslide Hazard and Risk Assessment (PLHRA) for the proposed Cairnoch Hill Wind Farm ("the Proposed Development").

The Proposed Development is for the construction and operation of up to four wind turbines (up to 180m to blade tip height) and associated infrastructure, on land owned by the Scottish Ministers and managed by Forestry and Land Scotland (FLS) (FLS) at Cairnoch Hill within the administrative boundary of Stirling Council. The location and layout of the Proposed Development is shown on **Figure 3.1: Site Layout** of the Environmental Impact Assessment (EIA) Report with the red line defining the Proposed Development application boundary ("the Site"). Full details of the Proposed Development are provided in **Chapter 3: Description of the Development.**

The purpose of this report is to consider the extent of peat and potential peat slide hazard at the Site and consider the potential impact from the Proposed Development, such that areas of deep peat and areas at high risk of a peat slide can be avoided where technically feasible during the design phase. Further consideration is given to stability risks due to construction of the Proposed Development and potential risks to receptors across the Site.

The methods adopted for the assessment follow relevant currently available best practice guidance issued by the Scottish Government[1] for investigation, assessment and reporting for electricity generation developments in peat areas. The guidance provides a screening tool to determine whether a PLHRA is required. The requirements to undertake a PLHRA are when blanket peat is present, slopes exceed 2° and the proposed infrastructure is located on peat, or when raised bogs are present. Some areas of the Proposed Development are situated on blanket peat, and with slopes greater than 2° are present therefore a PLHRA is required.

Where relevant, reference is also made to guidance published by the Scottish Environment Protection Agency (SEPA)[2] and wind farm construction good practice guidance[3] where relevant to construction on peat.

The work has been undertaken by a team of Geotechnical Engineers and Geologists, with over 18 years' experience in undertaking peat surveys and assessments, specialising in the assessment of renewable energy projects in Ireland and the UK.

The report should be read in conjunction with **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**, **Technical Appendix 10.2: Soils and Peat Management Plan (SPMP) and Technical Appendix 10.5: Peatland Condition Assessment (PCA)**.

1.2 Methodology

The peat stability assessment is primarily concerned with the influence of the peat on the development of the wind farm. The main objective is to assess the potential peat stability at the Site, identify areas of potential concern and identify mitigation measures to ensure the maintenance of peat stability before, during and after construction. All aspects of construction should be based on ensuring minimum disruption to the peat areas. The objectives have been achieved by completion of the following:

1 Peat Landslide Hazard and Risk Assessments (Scottish Government, April 2017)

2 Scottish Government, Scottish Natural Heritage, SEPA., (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only

3 NatureScot (July 2024), Good Practice During Wind Farm Construction. https://www.nature.scot/doc/good-practice-during-wind-farm-construction.

- A desk-based review of available reports which include geological, hydrological and topographical information;
- Site reconnaissance including several phases of peat surveys;
- Geomorphological mapping of the Site to identify the prevailing conditions influencing the potential for, or any evidence of, active, incipient or relict peat instability, including identification of the location and photographic record, as appropriate;
- 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;
- Identification of potential controls to be imposed on the Contractors for the works to minimise the risk of peat instability occurring during construction and operation of the Proposed Development; and
- Provide recommendations for further work or specific construction methodologies to suit the ground conditions at the Site to mitigate any unacceptable risk of potential peat instability.

The risk assessment is based on ground models developed using a Geographical Information System (GIS) specifically for this Proposed Development. A numerical analysis was undertaken in which coefficients were allocated for each of the factors influencing peat stability.

This system outlined above was developed in accordance with the guidelines on PLHRA by the Scottish Government[1] for the investigation, assessment, and reporting for wind farms in peat areas. The analysis and interpretation are based upon the results obtained from this process as well as previous experience and the results of case studies elsewhere. Where deviations from this guidance have occurred, this is highlighted and explained in the text.

2.0 Peat Instability

Although peat slides are naturally occurring events, they are a relatively rare phenomenon occurring in upland and lowland peats in the UK, Ireland and globally (Mills and Rushton, 2003[7]). However, the importance of assessing the stability of peat deposits in relation to wind farm developments came to the fore as a result of peat failures during the construction of Derrybrien[4] Wind Farm in Ireland in 2003. Although no fatalities were associated with these failures, there was a significant environmental impact. Wind farms tend to be constructed in upland areas which may be associated with significant peat deposits (typically blanket bogs). There is a potential for peat instability to occur, particularly where deposits are in excess of 1m thick.

Peat instability is influenced by many factors, including, but not limited to, peat thickness, hill slope gradient, underlying geology and subsurface hydrology.

This section reviews the nature of peat and how current and past activities can influence stability. The factors which are likely to influence the potential for peat instability are:

- Significant peat depths over impermeable bedrock or minimal soil;
- The presence of slope gradients greater than 2° (approximately) and general topography;
- Natural drainage paths and subsurface hydrology;
- Evidence of past failures, including soil creep;
- Drainage features at the base of slopes which could lead to undercutting; and
- Forestry plantations and artificial drainage and recent climate patterns.

Other anthropogenic factors may also increase the likelihood of peat instability events occurring, which are explored further within this report.

It should be noted that peat instability is not a recent phenomenon and there is documentary evidence of peat landslides dating back over 500 years[5]. Many landslides that involve peat have no human interference that could be considered as a trigger, and this should be borne in mind when considering the susceptibility of a site to potential instability.

2.1 Background Information Regarding Peat

2.1.1 Definition of Peat

Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the degree of decomposition. Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material and the peat ‘grows’ in-situ.

The Scottish Government Peat Landslide Hazard Best Practice Guide (2017) uses the following Joint Nature Conservation Committee (JNCC) report 445 ‘Towards an Assessment of the State of UK Peatlands’ definition for classification of peat deposits:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5m deep;

4 Lindsay, R.A. and Bragg, O., (2004), ‘Windfarm and Blanket Peat, The Bog Slide of 16th October 2003 at Derrybrien, Co. Galway, Ireland’. University of East London

5 Smith, L.T., (Ed) (1910), ‘The literary of John Leland in or about the years 1535-1543.’ Vol.5, Part IX. London: AF Bell and Sons.

- Peat: a soil with a surface organic layer greater than 0.5m deep which has an organic matter content of more than 60%; and
- Deep Peat: a peat soil with a surface organic layer greater than 1.0m deep.

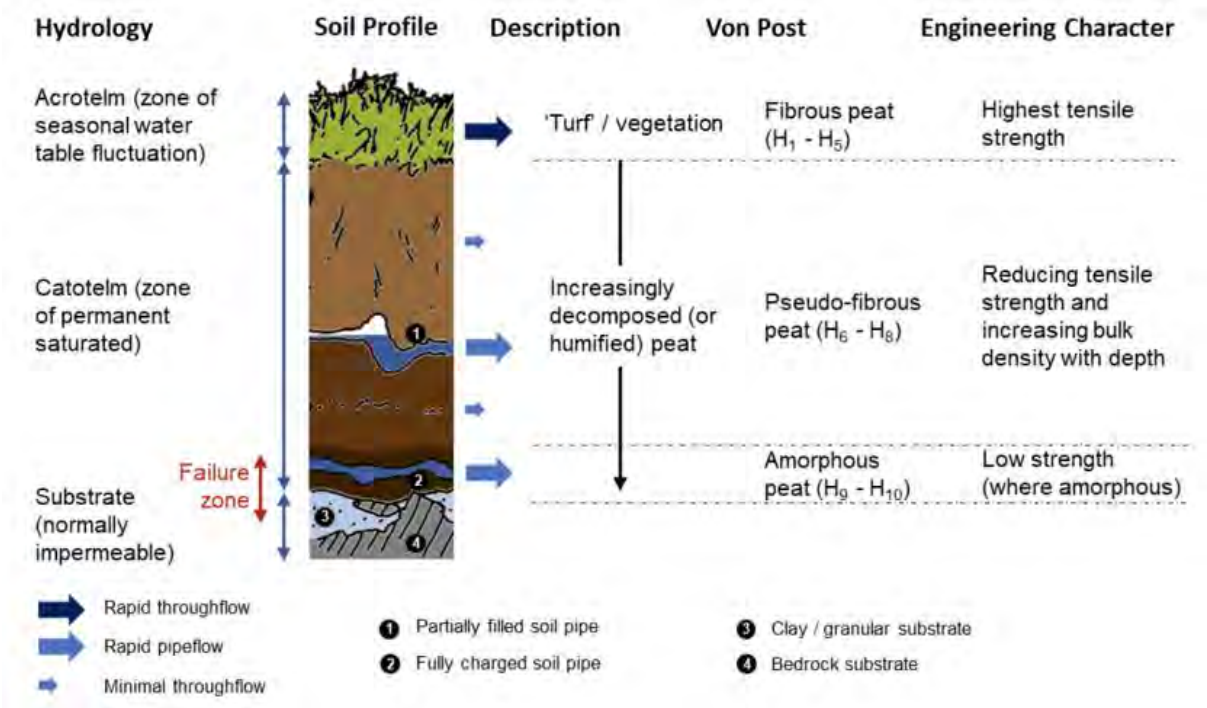
Peat is characterised by low density, high moisture content, high compressibility and low shear strength, all of which are related to the degree of decomposition and hence residual plant fabric and structure. To some extent, it is this structure that affects the retention or expulsion of water in the system and differentiates one peat from another.

Lindsay[6] defined two main types of peat bog, raised bog and blanket bog, which are prevalent on the West coast of Europe along the Atlantic seaboard. In Britain, the dominant peatland is blanket bog which occurs on the gentle slopes of upland plateaux, ridges and benches and is predominantly supplied with water and nutrients in the form of precipitation. Blanket peat is usually considered to be hydrologically disconnected from the underlying mineral layer.

There are two principal types of peat in a near natural peatland (see **Plate 1 below**):

- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1m to 0.6m deep; and
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling.

Plate 1 - Typical Peat Profile[7]



6 Lindsay, R.A., (1995), 'Bogs: The ecology, classification and conservation of Ombrotrophic Mires.' Scottish Natural Heritage, Perth.

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

The acrotelm is the fibrous surface to the peat bog[8], typically less than 0.6m thick, which exists between the growing bog surface and the lowest position of the water table in dry summers.

For geotechnical purposes the degree of decomposition (humification) can be estimated in the field by applying the 'squeezing test' proposed by von Post and Grunland[9] (1926) and as shown in Plate 1. The humification value ranges from H1 (no decomposition) to H10 (highly decomposed). The extended system set out by Hobbs[10] provides a means of correlating the types of peat with their physical, chemical and structural properties.

The relative position of the water table within the peat controls the balance between accumulation and decomposition and therefore its stability, hence artificial adjustment of the water table by drainage requires careful consideration.

2.1.2 Peat Shear Strength

In geotechnical terms, the shear strength of a soil is the physical characteristic that provides stability and coherence to a body of soil. For mineral soils such as clays or sands, such strength is variously given by an inter-particle friction value and cohesion. Depending on whether the mineral soil is predominantly cohesive (clay) or non-cohesive (sand) governs which of the components of strength control the behaviour of the soil.

For peat soils, where the major constituent is organic and there is likely to be little or no mineral component, the geotechnical definition of shear strength does not strictly apply. At present there is no real alternative method for defining the shear strength of peat, therefore the geotechnical definition is generally adopted, in the knowledge that it should be used with great caution.

As noted previously, the acrotelm or near surface peat comprises a tangle of fresh and slightly rotted roots and vegetable fibres. These roots and fibres impart a significant tensile shear strength capacity to the material which provides it with a significant load carrying capacity. The acrotelm is, in effect, a fibre reinforced soil.

In the more decomposed catotelm, the tensile shear strength is reduced as the roots and fibres become more rotted. However, the loss in strength due to decomposition is offset to a limited degree, by a gain in strength due to the overburden pressure. In geotechnical engineering there is an established relationship for recently deposited soils, between the shear strength of a sample and the thickness of overburden above it.

Consequently, it is almost impossible to predict a shear strength profile in peat and attempts to measure the shear strength using normal geotechnical methods can be misleading. Typical values of shear strength from hand shear vanes would be in the range 10-60 kilopascal (kPa) although values over 100 kPa have been recorded in peat elsewhere. The higher strengths are almost certainly the influence of roots or other non-decomposed material. It is believed that the strength of peat should be quoted as a cohesion value as there are few, if any, discrete particles to give the material a significant frictional resistance. It should be noted, however, that any quotation of shear strength for peat should be treated with extreme caution.

2.1.3 Peat Stability-Factors to be Considered

There is considerable observational information relating to debris and peat flows although the actual mechanisms involved in peat instability are not fully understood. The main influences on slope stability are geological, geotechnical, geomorphic, hydrological, topographic, climatic, agricultural and human influences such as drainage and construction activity. Peat is

8 Ingram, H.A.P., (1978), 'Soil layers in mires: function and terminology'. Journal of Soil Science, 29, 224-227.

9 Von Post, L. and Grunland, E., (1926), 'Sodra Sveriges torvillganger 1' Sverges Geol. Unders. Avh., C335, 1-127.

10 Hobbs, N.B., (1986), 'Mire morphology and the properties and behaviour of some British and foreign peats.' Quarterly Journal of Engineering Geology, London, 19, 7-80.

affected to a degree by changes in any of the above list and it is vital to appreciate that changes to the existing equilibrium would affect the level of slope stability during construction and operation of the Proposed Development.

Some of the contributory factors to peat instability are summarised as follows:

- The geographical limits which could be affected by potential instability are not confined to the artificial boundaries imposed by land ownership; landslip occurring above a site could affect the site and property down slope or downstream of the site for several kilometres;
- Agriculture and grazing have a substantial effect on peat areas, and this can be compounded in areas that have been managed to improve grazing. Grazing compacts the peat surface reducing the rainwater infiltration and the additional nutrients change the ecological balance of the original peat bog. Agricultural management can include surface drainage and periodic burning, both of which can leave the surface of the peat bare for a period of time, resulting in temporary desiccation of the surface. Subsequent wetting of the peat and resumption of peat accumulation results in the former desiccated and possibly ash covered surface being incorporated into the body of the peat which introduces a weak discontinuity in the profile; this in turn becomes another unknown factor in the stability assessment;
- Forestry has a substantial effect on slope stability particularly in the early stages as the creation of a forest involves disruption of the natural equilibrium and drainage of the slopes and the installation of artificial drains by deep ploughing. The construction of access tracks further disrupts the drainage and concentrates groundwater flow into narrow, fast flowing erosive streams. The work by Winter *et al* [11] noted that forest tracks can act to retard or concentrate the down slope flow of water and thus aid its penetration into the slope below. Such a mechanism has been observed at a number of recent landslips that have affected the road network in Scotland;
- Natural drainage – some of the precipitation falling onto a natural upland peat bog would be absorbed into the low permeability catotelm peat. However, most of the water would run-off as sheet flow through upper, high permeability acrotelm. Thus, the water is transmitted to the lower slopes in a reasonably controlled manner through a range of interconnections that operate at different scales and speed. Failure to understand this and to disrupt the transmission process for the groundwater could result in instability; and
- Artificial drainage - where agricultural drainage has been used to improve the quality of the grazing or to promote forestry, it reduces the overall volume of water entering the bog and transfers this water to the edges more rapidly. This can result in ditches and streams becoming enlarged, causing increased erosion and a greater silt burden in the stream water.

2.2 Peat Mass Stability

The principal surface indicator of peat slide potential is cracking of the peat land surface, and it is the identification of crack patterns in the field and the attendant causes of the cracking that is fundamental to a peat stability assessment.

11 Winter, M.R., Macgregor, F. and Shackman, L. (2005a), 'Scottish tracks networks landslide study' Trunk tracks: network management division, published report series. The Scottish Government.

Sites that have exhibited natural instability in the past are likely to be more susceptible to future instability during and following construction of a renewable energy development, therefore it is important to identify such instability as part of the Peat Stability Assessment.

2.2.1 Types of Failure

The result of instability in peat is the down-slope mass movement of the material; there are a number of definitions of peat instability which are used to characterise the type of failure including:

- Bog bursts or bog flows – the emergence of a fluid form of well humified, amorphous peat from the surface of a bog, followed by the settling of the residual peat, in-situ [12].
- Peat slides – the failure of the peat at, or below, the peat/substratum interface leading to translational sliding of detached blocks of surface vegetation together with the whole underlying peat stratum[11].
- Bog slide – an intermediate form of instability where failure occurs on a surface within the peat mass with rafts of surface vegetation being carried by the movement of a mass of liquid peat.

2.2.2 Bog Bursts

Accounts of bog bursts are generally associated with very wet climates or areas which have received storm rainfall events. Bog bursts can be associated with particularly wet peat landscapes; therefore, it is possible to identify broad regions of a higher susceptibility to these failures. The constraints used to identify the areas of higher susceptibility to bog burst failure are given below:

- Peat thickness greater than 2m;
- Shallow gradients, generally within the range of 2 to 5°, peat thicker than 1.5m is generally not observed on slopes steeper than 10°, also moisture content is generally reduced on steeper slopes due to drainage;
- Ground which is annually waterlogged to within the upper 1m below ground level (bgl) (the groundwater level may rise above this but rarely falls below); and
- Greater humification of the lower catotelm within the waterlogged ground; and lower surface tensile strength of the fibrous peat and vegetation.

The humified mass can be considered as analogous to a heavy liquid and the stability of this mass is maintained by the strength of the surface or acrotelm peat. Should the surface become weakened through erosion or desiccation or the construction of a surface drainage ditch for agricultural or forestry reasons or through turbary (peat cutting), failure is made more likely.

2.2.3 Peat Slides

Peat slides tend to be translational failures with a defined shear surface at or close to the interface with the substrate.

The factors generally considered to influence susceptibility to peat slide failures are listed below:

- Peat depth up to 2m;
- Slope gradients between 5° and 15°;

12 Dykes, A.P and Kirk, K.J., (2001), 'Initiation of a multiple peat slide on Cuilcagh Mountain, Northern Ireland.' Earth Surface Processes and Landforms, 26, 395-408.

- Natural or artificial drainage cut into the surrounding peat landscape;
- Greater humification of the lower catotelm within the waterlogged ground; and
- Lower surface tensile strength of the fibrous peat and vegetation.

It is noted that some of the factors causing instability are common to both bog bursts and peat slides.

The peat – substrate interface is the primary zone of failure and is enhanced by elevated water content at this boundary and softening or weathering of the lower mineral surface. For this reason, any investigation or probing should try to distinguish the nature of the lower mineral substrate.

2.2.4 Bog Slides

A bog slide is a variation on a peat slide where part of the peat mass is subject to movement, usually on an internal layer of material, which may be more prone to movement, such as an interface between the acrotelm and catotelm layer.

2.2.5 Natural Instability

The stability of a peat mass is maintained by a complex inter-relationship of many factors. Key factors include sloping rock head and proximity to a water body. Rainfall often acts as the trigger after the slope has already been conditioned to fail by natural processes.

It should also be remembered that peat bogs are growing environments and that there would come a time, on sloping ground, where the forces causing instability, the weight of the bog, can no longer be resisted by the internal strength of the peat and its interface with the underlying mineral surface. At this point, failure would occur.

The weight of the peat bog or any soils mantling steep hill slopes would be increased during periods of very heavy rain and it is common to see landslips occurring following extreme rain events. This may be a concern for future developments where one of the predicted effects of global warming will be a greater frequency of extreme weather, intense storms being one element.

3.0 Desk Based Review

3.1 Site Description

The Proposed Development is located immediately north of Carron Valley Reservoir and approximately 6km east of Fintry, centred at National Grid Reference (NGR) NS 69768 85606. The Proposed Development is located in an area of commercial forestry with minor pockets of open moor and heathland.

Access to the Site is gained off the B818 via existing forestry tracks.

Average ground elevations across the Site are noted to be on average approximately 227m Above Ordnance Survey (AOD) near Carron Valley Reservoir at the southern boundary of the Site with the local highpoint of Cairnoch Hill in the centre of the Site at approximately 413m AOD.

Information and historic maps from the National Library of Scotland[13] indicate that the Site has experienced limited changes over time. From the OS One Inch 1885-1900 map, the Site is shown to have been comprised of open undeveloped moorland. The historic map and aerial imagery review indicates that the majority of the Site was utilised for sheep farming.

Further details on land use and land management practices are provided within **Technical Appendix 11.5: Peatland Condition Assessment**.

3.2 Geology and Soils

3.2.1 Artificial Ground

Based on the information available from the British Geological Survey (BGS) Geoindex[14], no made ground deposits are mapped across the Site.

3.2.2 Superficial Geology

Based on the available BGS online data[14], the Site consists of variable superficial deposits including Devensian Till (generally mapped in the east, south and west, with isolated areas in the centre and north), Hummocky (Moundy) Glacial Deposits (encroaching the site boundaries to the north east, south and west), Peat (very small areas towards the north east and south) and Alluvium (very small areas encroaching the north east and south). Superficial geology BGS mapping is presented on **Figure 10.4: Superficial Deposits**.

3.2.3 Bedrock Geology

Based on the available BGS online data[14], the majority of the Site is underlain by basalt bedrock of the Campsie Lava Member (mapped in the south, west and north) and the Gargunnock Hills Lava Member (mapped in the centre and east). Additionally, basalts of the Spout of Ballochleam Lava Member (mapped along the northern boundary) and the Overton Lava Member (encroaching the north east boundary).

Igneous intrusive rocks are also noted within the Site comprising felsite and basaltic rocks of the Dinantian Dykes (present in an isolated area in the north) and Waterhead Central Volcanic-Complex (present in two isolated areas in the south).

13 National Library of Scotland, Map Finder Available from: https://maps.nls.uk/geo/explore/side-by-side/

14 BGS Online Viewer, available at [https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.133433804.376188765.1646739904-1030004651.1646739904]

Various linear features are present across the Site, all of which are denoted as being downthrow faults located along the north west (trending south west to north east), centre (trending south west to north east), west (trending west to east) and south eastern corner (trending south west to north east).

Bedrock geology BGS mapping is presented on **Figure 10.8: Bedrock Geology**.

3.3 Peatland Classification

The Carbon and Peatland Map 2016[15] indicates that Class 4 and 5 peatland is mapped across much of the northern half of the Site, with an isolated area of Class 3 peatland in the centre near Cairnoch Hill. The proposed crane pad associated with Turbine 1 and Turbine 3 are located within areas of Class 4 peatland, with the proposed crane pad associated with Turbine 2 and Turbine 4 located within areas of Class 5 peatland. Class 5 peatland also encroaches into the south east corner of Turbine 1.

Much of the south of the Site, including the temporary construction compound and substation compound, is underlain by mineral soils (Class 0). Mineral soil also encroaches onto the west of Turbine 4. An isolated area of Class 4 peatland is present in the south east of the Site adjacent to the site boundary.

No Class 1 or 2 peatland, considered nationally important priority peatland, is indicated across the Site.

The Carbon and Peatland mapping is presented on Figure 10.5: Peatland Classification.

3.4 Ground Stability Hazards

The BGS online data[14] records indicate that there is no risk regarding the mass movement or instability of materials.

3.5 Mining and Quarrying

Information from The Mining Remediation Authority Online Viewer[16] indicates that the Proposed Development is not within a Coal Mining Reporting Area or a Development High Risk Area.

3.6 Hydrogeology

The BGS online data[14] identifies the Site to be underlain predominantly by volcanic member Dinantian extrusive rocks, which are characterised as a low productivity aquifer. Transmission and storage of water are almost entirely confined to the near surface weathered zones and secondary fractures with all current flow through fractures and discontinuities.

3.7 Hydrology

The SEPA Water Classification Hub[17] identifies the majority of the Site to be underlain by the Carron and Touch waterbody (ID: 150598) with the north west underlain by the Campsie waterbody (ID: 150614), both of which have an overall classification of “good”.

Much of the Site is located within the River Carron (Carron Valley Reservoir to Avon Burn) surface water catchment, a part of the larger River Carron (Falkirk) main river catchment. The south and west of the Site are located within the nested catchment of, and drain directly to,

15 NatureScot, Carbon and Peatland Map 2016, Available online at: map.environment.gov.scot/soil_maps/

16 The Coal Authority, The Coal Authority Map Viewer, Available online at: https://datamine-cauk.hub.arcgis.com/

17 SEPA Water Classification Hub. Available at [https://www.sepa.org.uk/data-visualisation/water-classification-hub/]

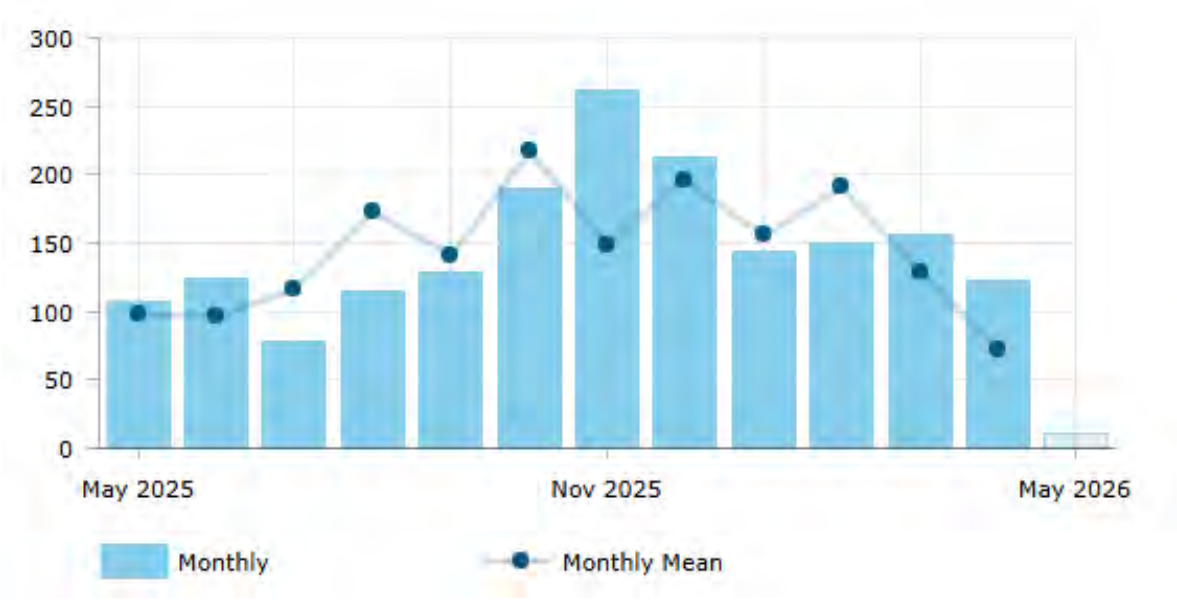
the Carron Valley Reservoir with the north east and east of the Site located within the Earls Burn nested catchment flowing generally south west along the north eastern boundary of the Site before discharging into the River Carron approximately 2.4km east. The north west extent of the Site is located within the Endrick Water (u/s Blane Water) surface water catchment, a part of the larger River Leven (Loch Lomond) main river catchment, flowing south west from the Proposed Development.

The Site is drained radially by multiple unnamed minor watercourses, with the highest concentration of these located in the south of the Site discharging directly into the Carron Valley Reservoir. Four minor watercourses in the north eastern extent of the Site drain into the Earl's Burn, while two drain the north western extent of the Site and discharge into the Endrick Water.

3.8 Rainfall

Periods of intense, heavy rainfall are often seen as triggers for instability events. Rainfall data from the closest SEPA[18] weather station at Earlsburn Reservoir RG (station number 568155) shows the monthly rainfall data from May 2025 to April 2026, with the station located 1.9km north of the Site. The month with the highest recorded rainfall was November 2025 with 261.8mm, and the month with the lowest recorded rainfall was in July 2025 with 77.6mm.

Plate 2: Monthly Rainfall totals in mm from Earlsburn Reservoir RG



3.9 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

As detailed in **Chapter 10: Geology, Hydrology, Hydrogeology and Soils**, all areas of identified potential GWDTE on the Site, have been proven to not be reliant on groundwater and instead are likely to be in hydraulic continuity with surface watercourses, or in areas identified by SEPA as likely to have surface water flooding. GWDTE are therefore not considered a receptor to potential peat instability.

18 SEPA, Rainfall Data for Scotland, available online at: https://www2.sepa.org.uk/rainfall

3.10 Private Water Supplies

As detailed in **Chapter 10: Geology, Hydrology, Hydrogeology and Soils**, there is one private water supply (PWS) in the vicinity of the Site, however it is located over 100m from the nearest infrastructure and so is determined to not be at risk from the Proposed Development. Further details are provided within **Chapter 10** and **Technical Appendix 10.4: Private Water Supply Risk Assessment**. PWS's are therefore not considered a receptor to potential peat instability.

3.11 Environmental Designations

A review of Naturescot SiteLink Map[19] confirms there are no relevant environmental designations within the Site, with the closest located approximately 2km west, and listed as the Endrick Water Site, Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). Environmental designations are therefore not considered a receptor to potential peat instability.

3.12 Geomorphology Review

The Site is characterised by the gentle sloping terrain that rises towards Cairnoch Hill, located at the centre of the Site at approximately 413m AOD. Flatter areas occur at break of slope and generally correspond to locations of deeper probe points (>0.5m).

The geomorphology of the Site has been significantly influenced by commercial forestry practises, with historic felling and replanting altering the natural landform. Associated drainage ditches and plough furrows have further modified the Site. As a result, areas of microtopography are present, forming localised depressions that often coincide with deeper probe points. Geomorphology mapping is detailed on **Figure 10.1.3: Geomorphology**.

Small bedrock outcrops were identified during Site surveys but were not found to be extensive.

Typical conditions observed throughout the Site are detailed below in the following photographs. Photographs 1 to 3 display the typical conditions at the Site.

19 NatureScot Data, available at https://sitelink.nature.scot/map

Photograph 1: Deep probe depth at an area of open forestry at T4. Taken from NGR: NS 70692 85362.



Photograph 2: Deep probe depth at an area of open forestry at the Construction Compound. Taken from NGR: NS 69941 84396.



Photograph 3: Soft mineral soil at the base of PC03. Taken from NGR: NS 70708 85371.



3.12.1 Peat Erosional Features

Limited peat erosional features were observed across the Site. Gully erosion was identified 100m north of T4 as seen in Photograph 4, however this was not found to be extensive with the exposure confined to the area. Onsite observation suggests that the gully is hydrologically influenced due to localised networks of drainage ditches. No areas of instability were noted in relation to any erosional features across the Site or within influencing distance of the Proposed Development.

Photograph 4: Exposed gully erosion up to 1.5m in height. Taken from NGR: NS 70760 85506.



3.12.2 Drainage

The Site features anthropogenic drainage along the existing access track, which was predominantly observed to be overgrown, see Photographs 5 and 6. The artificial drainage ditches were measured at 0.5m deep and 0.8m wide, however these measurements did vary with width, found to be up to 2m. Culverts were also present running perpendicular to the existing track.

Artificial drains within the forestry were observed during surveying, either as drainage ditches or through furrows as seen in Photograph 7. Forestry drains were measured at 0.5m deep and 0.5m wide, with flowing water observed. Drainage ditches trended parallel with the slope contours and were associated with openings in the forestry where deeper probe points were located.

No areas of instability were noted in relation to drainage across the Site.

Photograph 5: Trackside drainage trending east-west. Taken from NGR: NS 69442 84589.



Photograph 6: Wide vegetated drainage ditch trending north west – south east. Taken from NGR: NS 69761 84333.



Photograph 7: Forestry drainage ditch trending north west south east. Taken from NGR: NS 69981 84380.



3.12.3 Cuttings

Peat cuttings were not observed during a review of the aerial photography or Site visits.

3.12.4 Forestry

Forestry is found throughout the Site, predominantly as active plantation with felling present at T3 (See Photograph 8). The forestry within the Site is dense and consists of varying ages, correlating with prior felling and replanting periods (See Photographs 9 and 10).

Instability was noted in relation to forestry in the east of the Site at T4, with large quantities of fallen trees and wind throw present as seen in Photographs 11 and 12. As a result, restricting access to certain probe points.

Photograph 8: Felled forestry with vegetation regrowth at T3. Taken from NGR: NS 70224 85562.



Photograph 9: Start of young forestry at the Temporary Construction Compound north of the Substation Compound, facing west. Taken from NGR NS 70558 85029.



Photograph 10: Thick mature forestry facing east towards the track for T2. Taken from NGR NS 69067 86038.



Photograph 11: Fallen trees at T4, facing south west. Taken from NGR NS 70723 85388.



Photograph 12: Tree throw located east of T4. Taken from NGR NS 70697 85267.



3.12.5 Bedrock

From review of aerial photography, bedrock outcrops are not common across the Site. This was confirmed during Site walkovers where minimal bedrock outcrops were encountered. No areas of instability were noted in relation to bedrock exposures across the Site.

3.12.6 Previous Instability

No evidence of any significant historic peat failures or slides was observed at the Site from the aerial photographs and this was confirmed during Site visits with no evidence of any extension or compression features identified in the peat during Site visits.

4.0 Site Work

4.1 Peat Depth and Coring Survey

4.1.1 Methodology

Peat surveys were carried out in accordance with best practice guidance for developments on peatland[20,21]. Phase 1 (low resolution) peat probing was conducted on a 100m grid to identify the extent and depth of peat and inform preliminary Site layout designs. Phase 2 (detailed) peat probing was typically undertaken on tracks at 50m spacings with offset probing 10m either side. Infrastructure (turbines, hardstandings, compounds, etc) was typically probed at 10m spacings. Where upgraded infrastructure is proposed (access track) probing was undertaken adjacent to existing infrastructure.

The thickness of peat and soft sediment was assessed using a graduated fibre glass peat probe, approximately 12mm diameter and capable of probing depths of up to 10m. This was pushed vertically into the ground to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System (GPS) instrument.

The accuracy of the GPS was quoted as ±2m under open-sky conditions, with slightly reduced accuracy in areas of poor satellite visibility e.g. within dense forestry.

Where appropriate, conditions have also been assessed using visual interpretation e.g.:

- On steep slopes not conducive to peat formation;
- Areas of outcropping bedrock, or where conditions indicate a clear absence of peat e.g. glacial hummocks;
- Artificial or made ground deposits;
- Areas where probing is prohibited but conditions can be interpreted based on clear evidence at surface e.g. scheduled monuments;
- Areas where cuttings expose the underlying substrate; and
- Assessment of surface vegetation / habitat.

Where the peat probing met refusal on a hard substrate, the ‘feel’ of the refusal can provide an insight into the nature of the substrate. The following criteria were used to assess material:

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

The relative stiffness of the peat was also assessed from the resistance to penetration of the probe and to the effort required to extract the probes (retrieval of the probe was often impossible for one person). In all instances refusal was met on obstructions allowing identification of subsurface geology.

20 Scottish Renewables & SEPA (2012) ‘Developments on Peatland Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste’.

21 Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.

To determine the underlying condition of peat on the Site, and help identify the depth to acrotelm, several peat cores were extracted at targeted locations across the Site, representative of local conditions.

Cores were extracted using a 'Russian auger'. The Russian Auger allows for the collection of an undisturbed sample. Cores were photographed and logged in line with the Von Post scale of humification.

4.2 Survey Results

4.2.1 Peat Depth

Peat is generally defined as a soil with a surface organic layer in excess of 0.5m[20]. Where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as 'peaty soils'. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density.

A total of 3,229 peat probes were undertaken across all survey phases, with the results summarised in **Table A** with all probing data provided in **Annex A.** The maximum recorded depth of peat was 2.1 metres below ground level (mbgl), located in the north of the Proposed Development. The average thickness of peat across the Proposed Development was 0.3m.

Table A: Peat Probing Results

Peat Thickness (m)	**No. of Probes**	**Percentage (of total probes undertaken on-site)**
0 (no peat or soil)	152	4.7
0.01 – 0.49 (peaty soil)	2638	81.7
0.50 – 0.99	379	11.7
1.00 – 1.49	40	1.2
1.50 – 1.99	19	0.6
2.00 – 2.49	1	0
2.50 – 2.99	0	0
3.00 – 3.49	0	0
3.50 – 3.99	0	0
> 4.0	0	0

4.2.1.1 Substrate

Where possible, in the SLR investigation, an assessment of the substrate was made, as described previously. From the evidence of the probing and coring, the substrate was recorded as the following:

- Granular, recorded at 3,031 (94%) probe locations; and
- Rock, recorded at 198 (6%) probe locations.

Based on a review of the BGS mapping and Site surveys, the granular material is anticipated to be of glacial till origin and of weathered bedrock. No rock samples were recovered from probe locations however, based on the limited rock exposures and BGS mapping, the bedrock is interpreted to be igneous in nature.

4.2.2 Peat Coring

Peat is described using BS5930[22] and the Von Post classification[23]. Three peat cores were collected by SLR during phase 2 surveying, using a Russian Auger to inform interpretations of the underlying physical peat condition and underlying substrate. Peat samples were undertaken to depths of between 0.5 and 1 mbgl.

Table B: Peat Coring Results

Location	Von Post Degree of Decomposition	Description
PC01: East of T4 (NGR NS 70714 85305)	H3, B3	GL – 0.40 Dark brown PEAT with occasional wood fragments. 0.40 – 1.00 Brown organic sandy SILT with occasional wood fragments and rootlets.
PC02: T4 hardstand (NGR NS 70688 85352)	H3, B2	GL – 0.35 Dark brown silty PEAT with rare wood fragments. 0.35 – 0.5 Brownish grey sandy SILT with occasional rootlets.
PC03: T4 hardstand (NGR NS 70707 85371)	H5, B3	GL – 0.4 Brown pseudo-fibrous PEAT with occasional wood fragments. 0.4 – 1 Light brown sandy SILT with occasional wood fragments and rootlets.

Peat core logs and photographs are presented within **Annex B**.

22 BS 5930:2015+A1:2020, Code of practice for ground investigations

23 Von Post, L. and Grunland, E., (1926), 'Sodra Sveriges torvillganger 1' Sverges Geol. Unders. Avh., C335, 1-127.

5.0 Hazard and Risk Assessment

5.1 Introduction

The Scottish Government Guidance[1] provides an overview of the principles of hazard and risk with respect to peat landslides. The guidance is noted as illustrative only and the developers can present their own methodology providing, it is clearly explained and incorporates consideration of the likelihood of instability and the consequences should it occur. The following sections detail the preferred methodology used within this assessment.

A 'Hazard Ranking' system has been applied based on the analysis of risk of peat slide as outlined in the Scottish Government Guidance[1]. This is applied on the principle:

Hazard Ranking = Hazard x Exposure

5.2 Methodology

The determination of Hazard and Exposure values is based on a number of variables which impact the likelihood of a peat slide and the relative importance of these variables specific to the Proposed Development.

Similarly, the consequences or exposure to receptors is dependent on variables including the particular scale of a peat slide, the distance it will travel, and the sensitivity of the receptor.

In the absence of a predefined system, the approach to determining and categorising Hazard and Exposure is determined on a site-by-site basis. The particular system adopted for the PLHRA is outlined in the following sections.

5.3 Slope Stability

The stability of peat is a complex subject and there are numerous inter-relationships that affect the stability.

A quantitative assessment requires a numerical input, and such an analysis cannot account for the unquantifiable input required for a comprehensive peat stability assessment. For this reason, a purely quantitative assessment should only be considered as a guide, and a qualitative assessment of stability should be used to inform the final recommendations.

The characteristics of the peat failure phenomena have been incorporated in a stability risk assessment to evaluate the risk of instability occurring within the peat areas. The main factors controlling the stability of the peat mass are the surface gradients, the depth and condition of the peat at each location and the type of substrate.

The natural moisture content and undrained shear strength of the peat are important; however, it is generally accepted that where present, the peat would be saturated and have a very low strength. It is believed to be unrealistic to rely on specific values of shear strength to maintain stability when back analysis of failed slopes indicates that there is often a significant discrepancy between measured strength in peat and stability. Shear strength has been assumed to be constant and worst case, throughout this assessment. It has also been assumed, as a worst case, that the groundwater level is coincident with the ground surface.

5.4 Hazard

The potential for a peat slide to occur during the construction of the Proposed Development depends on several factors, the importance of which can vary from site to site. The factors requiring considerations would typically include:

- Peat depth;

- Slope gradient;
- Substrate material; and
- Evidence of instability or potential instability;

Of these, peat depth and slope gradient are considered to be principal factors. Without a sufficient peat depth and a prevailing slope, peat slide hazard would be negligible.

The rating system outlined below differs slightly from that proposed in the Scottish Government Guidance[1] as the system adopted here incorporates three inputs compared to two in the guidance, with the potential impact of substrate added in this section.

The probability of a peat landslide 'Hazard' (score) was derived by multiplying the coefficients for the four key factors together to produce a rating which is a measure of the likelihood of peat instability, and this enables potential areas of concern to be highlighted. For the assessment, the following rating system was applied as shown in **Table C**.

Table C: Probability of Peat Landslide

Risk Rating Coefficient	**Potential Stability Risk (Pre-Mitigation)**	**Action**
<5	Negligible	No mitigation action required.
5 - <16	Low	As for negligible condition plus development of a site-specific construction and management plan for peat areas.
16 - <31	Medium	As for low condition plus may require mitigation to improve site conditions.
31-50	High	Unacceptable level of risk, the area should be avoided. If unavoidable, detailed investigation and quantitative assessment required to determine stability and sensitivity to minor changes in strength and groundwater regime combined with long term monitoring.
>51	Very High	Unacceptable level of risk, the area should be avoided.

5.4.1 Peat Depth

The peat depth is shown on the peat depth interpolation figures provided in **Figure 10.1.1** and **Figure 10.1.2.** The interpolation was undertaken using the Spline with Barriers tool in ArcGIS Pro methodology.

The spline method produces a smooth surface through data points, therefore is particularly sensitive to outliers, which can distort the interpolated surface and may not fully capture abrupt changes in peat depth.

Detailed probing has been undertaken at all infrastructure locations, reducing the overall level of uncertainty, and limiting the impact of potential interpolation flaws.

Peat depths can still vary over small scale and therefore topographic changes in the bedrock profile, historical ground disturbance etc. may impact the total accuracy of the interpolated surface.

Table D shows the peat depth ranges and their related peat depth coefficients. The ground conditions were assessed by using peat depths recorded during peat probing. Thin peat was classed as being 0.5m to 1.5m thick, with deposits in excess of this being classed as thick. The thickness ranges used are intended to reflect the risk of instability associated with both peat slides (in thin peat) and bog slides. Where the probing recorded peat less than 0.5m

thick, this has been considered to be an organic soil rather than peat and are outside the scope of this assessment.

In addition to peat thickness, the presence of existing landslip debris or indicators of meta-stable conditions such as tension cracks or slumping in the peat suggest the material is likely to become even less stable should the existing ground conditions change.

Table D: Coefficients for Peat Depth

Peat Depth Range	Description	Peat Depth Coefficients	Notes
(<0.5m)	Peaty/organic soil	0	No peat/organic soil therefore no potential for peat slide
(0.5 – 1.5m)	Thin Peat	3	Sufficient peat thickness for peaty debris or peat slide
(>1.5m)	Thick Peat	2	Sufficient peat thickness for peat slide however less often recorded at this thickness, due to thicker peat generally occurring in areas of shallow gradients

5.4.2 Slope Gradients

Table E gives the coefficients applied to the categorised slope angles. The slope gradients were assessed by reference to the mapping and particularly the Digital Terrain Model (DTM) which was used to generate a slope map (**Figure 10.1.4**), from which the gradient at each probe location could be determined and input into the Peat Slide Risk data (**Annex A**). The gradient quoted at each location was based on the average gradient over a 5m grid.

Coefficients for slope gradient have been assigned to ensure the potential for both peat slides (gradients of 5-15°) and bog slides (gradients of 2-10°) are addressed. By simple inspection it is clear that steeper slopes pose a greater risk of instability than shallow gradients. Therefore, a graduated gradient scale from 0° to 15° (the practical maximum gradient on which peat is commonly observed) has been applied.

It should be noted that the 5m DTM resolution may not capture subtle variations in slope or small-scale geomorphological features, such as localised hummocks or micro-topographic variability, however it is deemed suitable for this stage of quantitative assessment, on the basis that it provides a conservative assessment, and more detailed topographic models would require site specific surveying.

Table E: Coefficients for Slope Gradients

Slope Angle (°)	Slope Angle Coefficients	Notes
Slope <2°	1	Failure unlikely due to flat ground
2°≤ Slope <5°	2	Failure in blanket bog areas would typically occur as bog slides, due to low slope angle.
5°≤ Slope <10°	4	Failure in blanket bog areas would typically occur as peat slides or bog slides.
10°≤ Slope <15°	6	Failure in blanket bog areas would typically occur as peat

Slope Angle (°)	Slope Angle Coefficients	Notes
		slides or peaty-debris slides. This is a key slope range for reported peat failures.
>15° Slope <20°	2	Failure would typically occur as peaty debris slides due to low thickness of peat on steeper slopes.
>20° Slope	1	Failure would typically occur as peaty debris slides due to low thickness of peat on steeper slopes.

5.4.3 Substrate

Table F shows the substrate type and their related substrate coefficient. As noted above, most failures in thin peat layers occur at the interface with the underlying substrate; the nature of the substrate has an influence on the probable level of stability.

Peat failures often occur within glacial till deposits in which an iron pan is observed in the upper few centimetres (Dykes and Warburton, 2007)[24]. They have also been observed over glacial till without an obvious iron pan, or over impermeable bedrock. They are rarely cited over permeable bedrock as the formation of peat deposits is deemed to be less likely.

Where sand and/or gravel (derived from glacial till) form the substrate, the effective strength of the interface can be considered to be good with comparatively high friction values. Under these conditions, failure is likely to occur in a zone within the peat, just above the interface. Further factors are necessary to cause a failure of this nature (increased pore pressures within the peat) and occurrence of such events is rare.

A rock substrate provides a high strength stratum, however, the rock surface can be smooth, and, depending on the dip orientation of the strata, it can provide a very weak interface. Therefore, it has been given a rating higher than that of granular material.

Where clay forms the interface, there is likely to be a significant zone of softening in the clay (due to saturation at low normal stresses, poor or non-existent vertical drainage and the effect of organic acids), resulting in either very low undrained shear strength or low effective shear strength parameters. The result is that potential shearing could occur either in the peat, on the interface or in the clay; all three possibilities have been documented in the past.

Table F: Coefficients for Substrate

Substrate Conditions	Substrate Coefficients	Notes
Granular Sands/Gravels/Weathered Rock	1	Peat failures sometimes associated with bedrock or granular till substrate
Rock (smooth interface)	2	Peat failures often associated with cohesive till substrate
Cohesive (clay)	3	Peat failures often associated with impermeable ‘smooth’ bedrock surface.

24 Dykes A and Warburton J (2007) Mass movements in peat: A formal classification scheme. Geomorphology 86, pp. 73–93

Probing across the Site indicated primarily granular and bedrock substrates using the refusal method. This was confirmed by coring at selected locations across the Site.

5.4.4 Evidence of Existing or Emerging Instability

Geomorphological considerations such as peat erosion, hagging, peat pipes, pools, and evidence of existing instability, can contribute to the potential for instability to arise.

Where evidence of existing or emerging instability was identified by surveyor observations or through mapping and aerial photography a coefficient score has been assigned, as shown in **Table G**.

Table G: Coefficient for Existing or Emerging Instability

Evidence of Existing/Emerging Instability	Existing or Emerging Instability Coefficient	Notes
Yes	2	Failures likely to occur where evidence of emerging/ developing instability is observed (peat pipes/collapsed pipes, areas of diffuse surface drainage such as flushes and pools, tension cracks, compression ridges, bulging, quaking bog) or in areas in close proximity to previous failure events.
No	1	No impact on likelihood of peat slide

5.4.5 Results

The table of results, included in **Annex A,** shows that 3,229 probe locations were identified within the extent of the DTM, peat (>0.5m) was present at 439. The stability risk rating identified the following:

- No peat was recorded at 152 locations (5%), hence no risk;
- Negligible risk at 2,666 (82%) locations;
- Low risk at 387 (12%) locations;
- Medium risk at 24 (<1%) locations; and
- High risk at 0 (0%) locations.

Figure 10.1.5 presents the interpreted risk of peat instability based on the multiplication of the risk coefficients discussed above in **Table D** to **Table G**.

5.5 Exposure

An assessment of the receptors ‘Exposure’ of the medium risk locations has been undertaken. It should be noted that the exposure assessment is primarily concerned with impacts that affect the environment, ecology, public or infrastructure associated with the Proposed Development, both onsite and potentially offsite. This assessment does not consider the detailed ecological impact of construction induced peat instability; however, the majority of the sensitive onsite receptors are the watercourses and thus the inferred ecological and environmental issues are addressed. The proposed mitigation measures in Section 6.0 would limit the potential for any slope failures into watercourses and drainage features hence limit

such impacts. The effect a slope failure may have on the construction site and infrastructure can be easily identified. However, the effect of an instability event on features impacted by an event not associated with the Proposed Development is harder to predict. In order to address this effect, it is not considered appropriate to assess the effect at every potential receptor location close to the Proposed Development; but rather to assess the effect a particular infrastructure feature (track, wind turbine, substation, etc.) would have on the structures or features surrounding it. By adopting such an approach, the assessment of infrastructure features where a risk ranking of 'negligible' or 'low' (assessed in the stability risk assessments described above) is discounted from further assessment.

The exposure coefficient (score) is derived by multiplying the receptor ranking coefficient (score) by the distance coefficient (score) and the elevation coefficient (score) for each impact receptor associated with a particular infrastructure feature. The ranking process by attributing the different weighting systems to each factor is detailed in the following sub-sections.

5.5.1 Receptor Ranking

Receptors are generally nearby structures or features that may be affected by peat movements caused during or following construction. Generally, only receptors immediately down gradient of the infrastructure feature could be affected by peat instability, therefore the first phase of feature ranking requires topographic ridges and valleys to be identified across the Proposed Development and surrounding area. From this, receptors at risk from particular infrastructure features can be identified. However, should instability occur on a steep slope, there is the risk of the back scarp of the instability migrating up-slope, there-by affecting areas previously considered not to be at risk.

The main receptors located within the Site and surrounding area which could potentially be affected in the event of a peat slide; were primarily watercourses and associated tributaries, existing tracks and paths and the Proposed Development infrastructure. The feature deemed to be the receptor for each medium or high slide risk location is identified in **Table M**. No GWDTE or PWS are deemed to be a receptor of any peat instability at this Site.

Following identification of receptors at risk, these are ranked according to their size and sensitivity. **Table H** presents the coefficients placed on particular receptor types.

Table H: Coefficients for Receptor Ranking

Nature of Feature	Feature Coefficient
Non-critical Infrastructure (including minor/private roads, estate tracks)	1
Wind Farm Infrastructure (including turbines, hardstandings, tracks, borrow pits, compounds, substation, etc.,)	2
Sensitive Hydrological Feature (including watercourses, GWDTE, PWS, etc.,)	3
Human Health (risk to workers or members of the public)	3
Sub-Community (settlement 1-10 residents)	4
Community (settlement of >10 residents)	5

5.5.2 Receptor Proximity

The proximity of an impact receptor is also critical in assessing the likely level of disruption it may suffer following an instability event. Based on this, two further coefficients – distance from

infrastructure feature and relative elevation differences between the infrastructure feature and impact receptor - are applied in deriving an impact ranking.

Published research recorded in a recent NatureScot study by Mills and Rushton (2023)[25], considers typical runout pathways, and the potential for impacts from peat landslides to have impacts beyond those distances.

For peat slides:

- The majority of peat slides partially or fully excavate the scarp area and undergo runout downslope;
- The combined scarp and runout lengths are typically in the order of 250 – 500m, with 90% of peat slides being < 500m in length from headscarp to the downslope limit of runout. The average length is 250m. Therefore, any receptors > 500m from a potential peat slide location are unlikely to be at risk; and
- Peat slide debris rapidly thins with distance (peat blocks reduce in size and number).

The logic is similar for bog bursts:

- The majority of bog bursts only partially excavate their 'source zones' (which can lack a clear headscarp);
- However, runout from the source zone is often similar in character and behaviour to that of peat slides; and
- The combined length of the source and runout zone in bog bursts is generally greater than for peat slides, with over 35% of failures > 500m in length. The average total length is 430m.

Table I and **Table J** present the coefficients derived for distance and elevation of impact receptors.

The quantitative assessment presented here does not account for the credibility of potential runout pathways e.g. the presence of physical barriers (such as forestry), the volume of source material (and therefore the likely scale of any landslide), or topographic constraints that may limit or prevent material from reaching identified receptors. A qualitative assessment of identified risk locations is considered in **Table M**.

Table I: Coefficient for Receptor Proximity

Distance from Coefficient Feature	**Distance Coefficient**
> 500m	1
100m – <500m	2
10 – <100m	3
0 – <10m	4

Table J: Coefficient for Impact Feature Elevation

Relative Elevation of Feature	**Elevation Coefficient**
0 -<10m	1
10 – <50m	2

25 Mills, A.J. and Rushton, D. (2023) – A risk-based approach to peatland restoration and peat instability. NatureScot Research Report 1259.

Relative Elevation of Feature	**Elevation Coefficient**
50 – <100m	3
> 100m	4

Based on distance to impact receptors, in this instance we have identified watercourses (which are the most sensitive receptor near the Proposed Development). The other receptors have been discounted, either they are not present or distance to receptor mitigates risk. Watercourses are the principal receptor as they are at risk of not only direct impact from a peat slide but potentially the watercourse creates a pathway to impact other receptors indirectly, either ecological or potential water users downstream. Based on **Table H** the watercourses would have an impact receptor coefficient (score) of 3 and then considering the distance to the receptor and the relative elevation differences onsite of receptors, a potential impact can be derived.

5.6 Hazard Ranking

In order to achieve a meaningful and manageable result from the hazard ranking, the results of the Hazard and Exposure have been normalised to a standard numerical scale (below).

Table K: Rating Normalisation

Hazard		**Exposure**	
Current Scale	Normalised Scale	Current Scale	Normalised Scale
Negligible <5	1	Very Low <10	1
Low 5 - <16	2	Low 11 - 20	2
Medium 16 – <31	3	High 21 - 30	3
High 31 - 50	4	Very High 31-50	4
Very High >51	5	Extremely High >51	5

The method of assessing probability of landslide, adverse consequence and hazard developed by SLR Consulting incorporates additional critical elements such as the substrate interface and coefficients for the receptor position, distance and elevation and as such is considered to be more rigorous than the assessment scheme proposed by the Scottish Government[1]. The Hazard Ranking scale does equate to the Scottish Government[1] scale, with rankings divided over four zones.

A simple multiplication of these coefficients would result in potentially large and unwieldy risk and impact rating numbers. SLR has therefore opted to normalise these values to bring them in line with the values used in the Scottish Government Guidance[1], as illustrated in **Table K**.

Table L: Hazard Ranking

Hazard Ranking	**Hazard Ranking Zone**	**Action**
1-4	Very Low	No mitigation action required although slide management and monitoring shall be employed. Slide management shall include the development of a site specific construction plan for peat areas.
5 - 10	Low	As for very low condition plus further investigation to refine the assessment combined with detailed quantitative risk assessment to determine appropriate mitigation through relocation or re-design.

Hazard Ranking	Hazard Ranking Zone	Action
11 - 16	Moderate	Consideration of avoiding project development in these areas should be made unless hazard mitigation can be put in place without significant environmental effect.
17-25	High	Unacceptable level of hazard; development within the area should be avoided.

The stability risk assessment has demonstrated that the majority of the Proposed Development lies within an area of negligible to low risk (99% of probe locations) with regards to stability based on **Figure 10.1.5**.

1% of probe locations identified a moderate or high risk of peat instability across the Proposed Development. Following review, the majority of these locations are not considered to have either a potential impact on the development infrastructure, due to locality, either well away from influencing infrastructure, in a down gradient position or have no impact on the local watercourses (receptors). Therefore 3 moderate risk sites have been identified and are discussed in the following section.

The stability risk assessment results presented in **Table M** shows the calculated hazard ranking associated with every location where there is a stability risk of moderate or above, at or close to infrastructure. The particular mitigation measures to reduce the risk of instability occurring are dependent upon location and the type of proposed structure. Proposed mitigation measures and actions already undertaken to reduce the risk of peat instability occurring are also identified in **Table M**, together with the associated, revised hazard ranking. A more detailed discussion of the possible mitigation measures is presented in Section 6.0.

6.0 Slide Risk and Mitigation

6.1 Overview

As previously discussed no historic peat instability has been observed across the Proposed Development. However, appropriate good practice and mitigation measures should be followed to minimise the effects of any peat instability.

The Proposed Development requires the preparation of a Construction and Environment Management Plan (CEMP) and a Construction Management Statement (CMS). These documents must integrate best-practice measures specifically designed for electricity-generating projects within peatland environments. Both plans will be subject to ongoing review and updates throughout the pre-construction and construction phases to ensure continued adherence to established guidance.

A number of mitigation measures can be implemented to further reduce the risk levels identified across the Proposed Development. These range from infrastructure specific measures to general good practice that should be applied across the Proposed Development to increase awareness of peat instability and enable early identification of potential displacement and opportunities for mitigation.

Risks may be mitigated by:

- Undertaking site specific stability analysis using better quality geotechnical data, final design loads for infrastructure and detailed ground models in areas of specific concern.
- Precautionary construction measures – including use of monitoring, good practice and a geotechnical risk register relevant to all locations.

Mitigation measures are provided below specific to each area of “Moderate” or “High” risk. These mitigation measures will also help further reduce “Low” and “Negligible” risks to potential receptors. Section 6.2 provides information on good practice pre-construction, during construction and post-construction (i.e. during operation).

6.2 Embedded Mitigation

The paragraphs below detail good practice that is recommended during construction and follow the principles detailed in the NatureScot Guidance (2024)[4]. These measures are considered 'embedded mitigation' for the purposes of the assessment, and have been assumed to be in place for the purposes of the assessment presented in the EIA Report:

Construction Management (Health & Safety)

To prevent injury to construction workers or members of the public during construction of the Proposed Development, the following control measures and mitigation should be adopted.

- The CEMP/CMS shall be produced and incorporate the conclusions of the peat stability report, continuously update the assessment and develop appropriate mitigations to respond to the peat slide risk as development proceeds;
- A documented procedure shall be in place and rapid reaction strategy in place prior to the commencement of construction on peat land. This strategy shall be enacted should signs of peat movement be recorded across the Proposed Development. This approach requires periodic and continued monitoring of the construction process by a suitably qualified geotechnical engineer;
- Awareness of peat instability and pre-failure indicators should be incorporated in Site induction and training to enable all site personnel to recognise ground disturbances and features indicative of incipient instability;

- Specific work method statements to monitor compliance of activities in susceptible areas;
- All construction activities and operational decisions that involve disturbance to peat deposits should be overseen by an appropriately qualified geotechnical engineer with experience of construction on peat sites;
- Review weather forecasts to prevent working in areas of peat instability risk during periods of heavy rainfall;
- Engineered drainage measures—including surface soakaways and gullies, and subsurface piping—should be installed to divert surface and groundwater flow away from high-risk areas;
- Localised re-profiling will be implemented only where the resulting reduction in hazard risk outweighs the associated environmental impact; and
- Where feasible, construction machinery should operate from established surfaces. Where peat access is unavoidable, low-ground-pressure plant must be utilised to minimize ground disturbance.

Geotechnical Risk Register

It is recommended that a geotechnical risk register (GRR) should be prepared for the Proposed Development following intrusive investigations post-consent and location specific stability analyses – the risk register should be considered a live document and updated with site experience as infrastructure is constructed.

The purpose of this report is to consider the potential risk of peat slides and general geotechnical instability occurring at the Proposed Development such that these risk areas are identified and that suitable controls and appropriate methodologies can be implemented during the operation of the Site, to mitigate against these risks.

The following control measures and mitigation should be incorporated into the GRR during construction of the Proposed Development:

- The observation of any peat instability and pre-failure indicators should be recorded in the GRR during the setting out of proposed works;
- Awareness of peat instability and pre-failure indicators should be incorporated in site induction and training to enable all Site personnel to recognise ground disturbances and features indicative of incipient instability;
- Monitoring checklists should be prepared with respect to peat instability addressing all construction activities proposed for Site;
- It is recommended that a regular regime of monitoring is undertaken across the Site and primarily focus on assessing stability and risk at each of the areas identified as “Medium to High” risk visually. Any additional areas of concern should be added to the risk register and continually monitored until the risk is no longer present;
- Each monitoring visit should be documented in a short summary report detailing the site conditions and any changes. The report should also be accompanied by photographs detailing the conditions at each identified risk zone; and
- As part of the GRR, regular inspection and monitoring of stored peat should be undertaken until temporary storage has been completed. This involves the recording of any visual signs of ground movement including identification of tension cracking or slumping of peat material. Future inspection frequency would be determined post construction and be dependent upon meteorological conditions.

The following activities will be built into any monitoring of groundworks undertaken as part of the GRR:

- Ponding on the upslope side of infrastructure sites and on the upslope side of access tracks;
- Subsidence and lateral displacement of tracks;
- Excessive floating track settlement;
- Blockage or underperformance of the installed site drainage system;
- Movement of underground cables; and
- Development of tension cracks, compression features, bulging or quaking bog anywhere in a 50m corridor surrounding the Site of any construction activities or Site works.

Earthworks

The following control measures and good practice when considering excavations within peat and other and general earthworks activities during the construction:

- Use of appropriate supporting structures around peat excavations to prevent collapse and the development of tension cracks;
- Avoid cutting trenches or aligning excavations across slopes (which may act as incipient head scarps for peat failures) unless appropriate mitigation has been put in place;
- Implement methods of working that minimise the cutting of the toes of slopes, 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).

Peat Storage

The following control measures and good practice when considering temporary storage of peat during the construction:

- Ensure stored peat is not located in areas identified with ‘Moderate’ or higher peat landslide likelihoods;
- Undertake site specific stability analysis for all areas of peat storage to ensure the likelihood of destabilisation of underlying peat is minimised. Analysis should consider the slope angle of the storage location, the thickness of peat being stored and being loaded, and use representative parameters for both the stored and underlying peat;
- Avoid storage of peat in areas of peat >1m in depth;
- Ensure adequate drainage is maintained for any peat storage areas;
- Minimise haul distances for peat, storing as near to excavation as possible; and

- Monitor effects of wetting/re-wetting stored peat on surrounding peat areas and prevent water build up on the upslope side of peat mounds. Mitigate any run-off.

Drainage Measures

Drainage design is a critical mitigation measure in maintaining the hydrological conditions. In order to maintain hydrological conditions, the following requirements of the drainage measures should be met:

- Minimise the impact 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;
- Development of drainage systems that would not create areas of concentrated flow or cause over-, or under-, saturation of peat habitats;
- Existing drainage which was installed during the construction should be retained for the long-term to ensure the stability of peat deposits;
- A robust design of drainage systems and associated measures (i.e. silt traps, etc.) to minimise sedimentation into natural watercourses;
- Development of robust drainage systems that would require minimal maintenance; and
- Measures shall be put in place to ensure drainage systems are well maintained, to include the identification and demarcation of zones of sensitive drainage or hydrology, e.g. inclusion of maintenance regimes for drainage systems into an operational management plan or similar.

Track Construction

The following control measures and good practice should be adopted when construction access tracks across the Proposed Development:

- Prior to the construction, setting out the centreline of the proposed track should include a walk over performed by the site manager or general foreman, along with the suitably qualified Geotechnical Engineer, and appropriate Clerk of Works. This should be carried out to check that the ground conditions/drainage paths are as expected, and “fine-tuning/micrositing” of the alignment if required;
- Weather policy should be agreed and implemented during works, e.g. identifying ‘stop’ rules (i.e. weather dependent criteria) for cessation of track construction or trafficking (e.g. allowing tracks to thaw following periods of hard frost);
- Allow peat to undergo primary consolidation by adopting rates of road construction appropriate to weather conditions;
- Maintain drainage pathways through tracks to avoid ponding of water upslope;
- Monitor the top line of excavated peat deposits for deformation post-excavation;
- Monitor the effectiveness of cross-track drainage to ensure it water remains free-flowing and that no blockages have occurred;
- Where upgraded tracks are required, existing tracks and surrounding areas should be further investigated to determine the most suitable sections to upgrade. Avoiding deeper areas of peat adjacent to the existing track is deemed a priority; and
- Where possible, upgraded sections of track should tie into the existing track construction.

6.3 Proposed Mitigation

As noted in **Figure 10.1.5**, where the risk assessment has identified a negligible or low risk of peat instability, no specific mitigation measures are necessary. However, to ensure best practice is employed, there would be a need for careful monitoring and the construction management must include careful design of both the permanent and temporary works appropriate for peat soils, as detailed in Section 6.2.

The areas of the infrastructure that were rated as moderate or high risk, or above, were subjected to a hazard assessment; a number of areas were discounted as they do not fall within influencing distance of any of the key proposed site infrastructure. The procedure adopted was to review the peat slide risk data and identify those areas with a moderate risk or greater, that were in close proximity or influencing distance of any of the proposed infrastructure or watercourses. Those risk areas where there is no development would not affect the natural stability of the peat.

Table M lists the locations that have been identified to have a moderate risk of peat instability on the Proposed Development infrastructure. A variety of mitigation measures are recommended to reduce the risk of peat instability. Analysis of each location has shown that all can be mitigated to a Hazard Ranking of “Low or Very Low”.

Table M: Risk Register

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
1	Medium	Low	Moderate	T2 Hardstanding	Upgraded access track	Risk location impacted by localised peat deposits (0.5-1m) and steep slopes. There is no key receptor at risk of peat slide due to the dense forestry effectively containing any peat landslide. The nearest receptor is greater than 250m away from the potential risk location. Risk locations are localised with an absence of significant peat deposits to generate sufficient peat mass to generate a peat slide. However, to prevent any localised peat movement, the excavation of peat prior to construction would reduce and mitigate risk of peat landslide. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Very low
2	Medium	Low	Moderate	T2 Hardstanding	Upgraded access track	Risk location impacted by localised peat deposits (0.5-1m) and steep slopes. There is no key receptor at risk of peat slide due to the dense forestry effectively containing any peat landslide. The nearest receptor is greater than 250m away from the potential risk location. Risk locations are localised with an absence of significant peat deposits to generate sufficient peat mass to generate a peat slide. However, to prevent any localised peat movement, the excavation of peat prior to construction would reduce and mitigate risk of peat landslide.	Very low

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
3	Medium	Low	Moderate	Access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5-1m) and steep slopes. Use of floating track in areas of peat >1m and slopes <5 degrees would be advised. Should floating track not be suitable, excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards the north. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Very low

7.0 Conclusion

This report has highlighted the complicated inter-relationship between all the aspects that have an effect on the stability of peat. Consequently, the discussion has also addressed areas of construction and drainage in order to avoid a stability problem rather than attempt to put it right after the event. The Site has been assessed for potential hazards associated with peat instability; the assessment has been based on:

- A walk-over survey by an experienced geologist;
- A thorough inspection of the digital terrain map;
- Review of historical and geological maps and publications and aerial photography; and
- A detailed geotechnical probing exercise at 3,229 locations in areas of identified peat to determine the thickness thereof.

The geomorphology of the Site has been significantly influenced by commercial forestry practises, with historic felling and replanting altering the natural landform. Associated drainage ditches and plough furrows have further modified the Site.

There was no evidence of any significant historic peat failures or slides across the Site from the aerial photographs, nor from review of local newspapers or historic mapping.

A total of 3,229 peat probes were undertaken across all survey phases. The maximum recorded depth of peat was 2.1 mbgl, located in the north of the Site. The average thickness of peat across the Site was 0.3m. Probing indicated that 86% of peat probe locations encountered <0.5 m of peat. 13% of probe locations identified peat between 0.5 to 1.5m, and the remaining 1% of probe locations encountered peat depths >1.5m.

The results indicate that 1% of probe locations are at moderate or high risk of peat instability. The majority of these locations are not considered to have either a potential impact on the Proposed Development infrastructure. Therefore three moderate risk sites have been identified and are discussed in detail. A variety of mitigation measures are recommended to reduce the risk of peat instability. Analysis of each location has shown that all can be mitigated to a Hazard Ranking of “Very Low”.



Figures

Technical Appendix 10.1: Peat Landslide Hazard Risk Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

SLR Project No.: 428.V12085.00001

268000 269000 270000 271000

687000 686000 685000

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- Probe Location

Probe Depth (m)

- 0
- >0, ≤0.5
- >0.5, ≤1
- >1, ≤1.5
- >1.5, ≤2
- >2, ≤3

N

T1 T2 T3 T4

Cairnoch Hill

Craigannet Hill

Craigannet Craig

Sir John de Graham's Castle

Haugh Hill

Priest's Croft

Burial Gd

Quarry (Stone)

Sheepfold

Easter Cringate

Earl's Burn

Sluice

Carron Valley

0 0.25 0.5 1

Kilometres

Eurowind Energy

SLR

CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

PROBE DEPTH PLAN

FIGURE 10.1.1

Scale 1:12,000 @ A3

Date JUNE 2026

428.V12085.00001.0150.0 Probe Depth

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268000 269000 270000 271000

687000 686000 685000

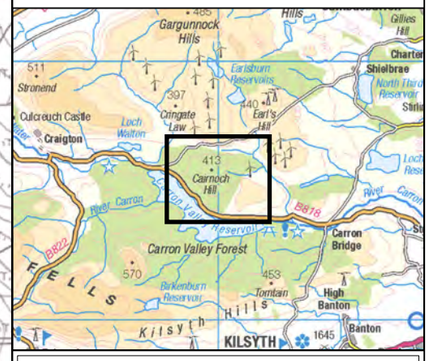
N

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- Probe Location

Probe Depth (m)

- >0.5, ≤1
- >1, ≤1.5
- >1.5, ≤2
- >2, ≤3



0 0.25 0.5 1

Kilometres

Eurowind Energy

SLR

CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

PROBE DEPTH ABOVE > 0.5 M

FIGURE 10.1.2

Scale 1:12,000 @ A3

Date JUNE 2026

428.V12085.00001.0151.0 Probe Depth Above 0_5m

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268000 269000 270000 271000

687000 686000 685000

T1 T2 T3 T4

Carron Valley Reservoir

Craigannet Hill

Haugh Hill

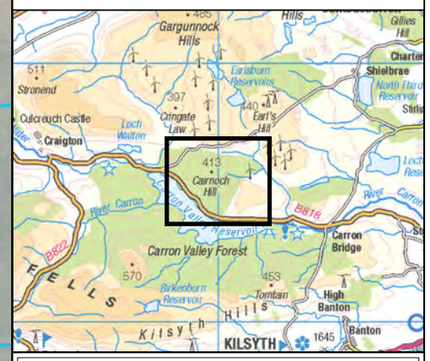
N

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Geomorphology

- Break in Slope
- Direction of Slope
- Existing Borrow Pit
- Forestry



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CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

GEOMORPHOLOGY

FIGURE 10.1.3

Scale	Date
1:12,000 @ A3	JUNE 2026

0 0.25 0.5 1

Kilometres

428.V12085.00001.0152.0 Geomorphology

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Aerial Imagery (2023) Source: RGB Aerial Photography - © Bluesky International

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268000 269000 270000 271000

687000 686000 685000

T1 T2 T3 T4

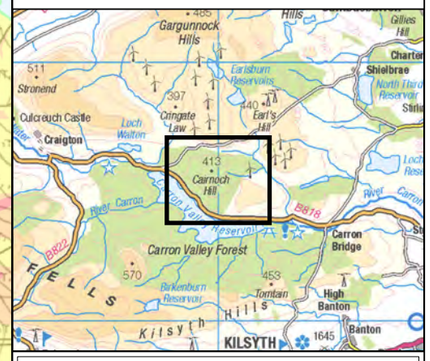
Sheepfold
Easter Cringate
Earl's Burn
Waterfall
Ford
Sluice
Quarry (Stone)
Sir John de Graham's Castle Motte & Bailey
Cairnoch Hill
413
Craigannet Hill
Craigannet Craig
Quarry (Stone)
Priest's Croft
Burial Gd
Haugh Hill
Corran Valley

87 86 85 84

N

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- 0 - 2
- 2 - 4
- 4 - 8
- 8 - 12
- >12



0 0.25 0.5 1

Kilometres

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EIAR - TA10 - PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

SLOPE

FIGURE 10.1.4

Scale 1:12,000 @ A3

Date JUNE 2026

428.V12085.00001.0153.0 Slope

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268000 269000 270000 271000

687000 686000 685000

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)

Peat Slide Risk

- Negligible
- Low
- Medium
- Identified Slide Risk Zone
- Direction of Peat Slide

N

T1 T2 T3 T4 1 2 3

Cairnoch Hill 413

Craigannet Hill 354

Haugh Hill

Carron Valley Reservoir

Sir John de Graham's Castle

Sheepfold

Easter Cringate

Earl's Burn

Quarry (Stone)

Priest's Croft

Burial Gd

Craigannet Craig

Kilometres 0 0.25 0.5 1

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EIAR - TA10 - PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

PEAT SLIDE RISK

FIGURE 10.1.5

Scale 1:12,000 @ A3

Date MAY 2026

428.V12085.00001.0154.0 Peat Slide Risk

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Annex A Peat Risk Data

Technical Appendix 10.1: Peat Landslide Hazard Risk Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

SLR Project No.: 428.V12085.00001

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1	269963	684024	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2	269981	684049	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3	269968	684071	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
4	270000	684108	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
5	270008	684094	0.1	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
6	270044	684122	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
7	270033	684149	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
8	270052	684170	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
9	270031	684198	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
10	270031	684238	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
11	270032	684272	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
12	270047	684305	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
13	270029	684314	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
14	270022	684363	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
15	270038	684404	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
16	270021	684413	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
17	270075	684435	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
18	270101	684453	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
19	270175	684428	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
20	270153	684446	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
21	270219	684450	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
22	270200	684460	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
23	270253	684484	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
24	270238	684492	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
25	270292	684517	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
26	270273	684524	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
27	270320	684556	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
28	270306	684565	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
29	270345	684598	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
30	270331	684606	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
31	270371	684643	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
32	270354	684649	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
33	270404	684682	0.0	Soil	Granular	4	No Peat	0	2	1	0	None
34	270386	684689	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
35	270426	684725	0.1	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible
36	270407	684734	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
37	270422	684781	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
38	270449	684824	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
39	270466	684813	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
40	270497	684853	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
41	270479	684860	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
42	270520	684900	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
43	270562	685008	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
44	270545	685012	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
45	269258	686444	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
46	269258	686434	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
47	269268	686424	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
48	269288	686415	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
49	269298	686414	0.6	Soil	Granular	2	Thin Peat	3	1	1	3	Negligible
50	269315	686406	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
51	269327	686404	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
52	269338	686395	0.5	Peat	Granular	5	Thin Peat	3	4	1	12	Low
53	269349	686393	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
54	269357	686395	0.7	Peat	Granular	5	Thin Peat	3	4	1	12	Low
55	269358	686425	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
56	269363	686438	0.2	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
57	269339	686424	0.2	Soil	Rock	3	Peaty Soil	0	2	2	0	Negligible
58	269340	686415	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
59	269338	686406	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
60	269347	686406	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
61	269349	686416	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
62	269349	686425	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
63	269349	686434	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
64	269357	686434	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
65	269358	686444	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
66	269349	686444	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
67	269349	686454	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
68	269339	686434	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
69	269339	686445	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
70	269339	686453	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
71	269328	686454	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
72	269329	686445	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
73	269329	686435	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
74	269329	686424	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
75	269329	686415	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
76	269318	686474	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
77	270575	685053	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
78	270556	685056	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
79	270563	685107	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
80	270578	685103	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
81	270593	685152	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
82	270575	685156	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
83	270622	685195	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
84	270605	685200	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
85	269343	686493	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
86	269316	686499	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
87	269309	686485	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
88	269336	686476	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
89	269278	686495	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
90	269263	686516	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
91	269233	686478	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
92	269247	686452	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
93	269228	686432	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
94	269242	686396	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
95	269224	686328	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
96	269221	686285	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
97	269237	686262	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
98	269214	686234	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
99	269230	686215	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
100	269207	686183	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
101	269242	686318	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
102	269226	686164	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
103	269199	686120	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
104	269187	686135	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
105	269161	686093	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
106	269121	686061	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
107	269110	686074	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
108	269082	686029	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
109	269069	686043	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
110	269866	685278	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
111	269835	685269	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
112	269880	685254	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
113	269911	685272	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
114	269857	685276	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
115	269925	685256	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
116	269960	685286	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
117	269971	685273	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
118	270018	685295	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
119	270007	685309	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
120	269819	685299	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
121	269791	685297	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
122	269781	685327	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
123	269752	685330	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
124	269746	685365	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
125	269718	685363	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
126	269712	685402	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
127	269685	685404	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
128	269684	685443	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
129	269656	685449	0.1	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
130	269658	685486	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
131	269630	685487	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
132	269620	685515	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
133	269584	685503	0.1	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
134	269570	685524	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
135	269534	685511	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
136	269520	685531	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
137	269488	685516	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
138	269474	685536	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
139	269439	685517	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
140	269420	685534	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
141	269386	685516	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
142	269371	685541	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
143	269337	685535	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
144	269329	685560	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
145	269296	685558	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
146	269282	685584	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
147	269251	685580	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
148	269237	685607	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
149	269217	685607	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
150	269210	685601	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
151	269114	685643	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
152	269070	685662	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
153	269191	685627	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
154	269104	685668	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
155	269054	685691	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
156	269024	685684	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
157	269010	685710	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
158	268986	685715	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
159	268964	685762	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
160	268944	685806	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
161	268964	685848	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
162	268982	685898	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
163	269002	685943	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
164	268970	685901	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
165	268987	685947	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
166	269035	686007	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
167	268969	685784	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
168	268967	685794	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
169	268978	685796	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
170	268978	685784	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
171	268979	685773	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
172	268978	685765	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
173	268977	685804	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
174	268977	685814	0.0	Rock	Rock	11	No Peat	0	6	2	0	None
175	268987	685754	0.0	Rock	Rock	7	No Peat	0	4	2	0	None
176	268988	685763	0.0	Rock	Rock	5	No Peat	0	4	2	0	None
177	268989	685775	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
178	268989	685785	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
179	268987	685794	0.0	Rock	Rock	10	No Peat	0	4	2	0	None
180	268988	685804	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
181	268989	685813	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
182	268998	685804	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
183	268996	685794	0.0	Rock	Rock	18	No Peat	0	2	2	0	None
184	268997	685783	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
185	268998	685774	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
186	268999	685764	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
187	268997	685754	0.0	Rock	Rock	11	No Peat	0	6	2	0	None
188	269008	685755	0.0	Rock	Rock	8	No Peat	0	4	2	0	None
189	269008	685763	0.0	Rock	Rock	15	No Peat	0	2	2	0	None
190	269010	685775	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
191	269009	685783	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
192	269008	685794	0.0	Rock	Rock	6	No Peat	0	4	2	0	None
193	269008	685804	0.0	Rock	Rock	24	No Peat	0	2	2	0	None
194	269017	685804	0.0	Rock	Rock	23	No Peat	0	2	2	0	None
195	269019	685793	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
196	269018	685784	0.0	Rock	Rock	2	No Peat	0	2	2	0	None

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
197	269019	685774	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
198	269017	685765	0.0	Rock	Rock	19	No Peat	0	2	2	0	None
199	269019	685754	0.0	Rock	Rock	8	No Peat	0	4	2	0	None
200	269028	685765	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
201	269027	685774	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
202	269028	685784	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
203	269029	685795	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
204	269029	685803	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
205	269029	685813	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
206	269040	685763	0.0	Rock	Rock	30	No Peat	0	2	2	0	None
207	269038	685773	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
208	269037	685785	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
209	269038	685794	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
210	269039	685803	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
211	269039	685814	0.0	Rock	Rock	41	No Peat	0	2	2	0	None
212	269049	685813	0.0	Rock	Rock	44	No Peat	0	2	2	0	None
213	269058	685813	0.0	Rock	Rock	39	No Peat	0	2	2	0	None
214	269047	685803	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
215	269048	685793	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
216	269048	685784	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
217	269048	685772	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
218	269048	685763	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
219	269057	685765	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
220	269057	685775	0.0	Rock	Rock	29	No Peat	0	2	2	0	None
221	269059	685783	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
222	269060	685793	0.0	Rock	Rock	44	No Peat	0	2	2	0	None
223	269058	685803	0.0	Rock	Rock	43	No Peat	0	2	2	0	None
224	269069	685763	0.0	Rock	Rock	10	No Peat	0	4	2	0	None
225	269068	685775	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
226	269068	685784	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
227	269066	685793	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
228	269070	685806	0.1	Soil	Rock	18	Peaty Soil	0	2	2	0	Negligible
229	269067	685813	0.1	Soil	Rock	12	Peaty Soil	0	6	2	0	Negligible
230	269067	685823	0.1	Soil	Rock	7	Peaty Soil	0	4	2	0	Negligible
231	269057	685823	0.1	Soil	Rock	7	Peaty Soil	0	4	2	0	Negligible
232	269048	685825	0.1	Soil	Rock	5	Peaty Soil	0	2	2	0	Negligible
233	269039	685824	0.1	Soil	Rock	5	Peaty Soil	0	4	2	0	Negligible
234	269029	685824	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
235	269018	685816	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
236	269009	685814	0.1	Soil	Rock	10	Peaty Soil	0	4	2	0	Negligible
237	269018	685824	0.1	Soil	Rock	9	Peaty Soil	0	4	2	0	Negligible
238	269009	685824	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
239	269001	685813	0.1	Soil	Rock	10	Peaty Soil	0	6	2	0	Negligible
240	269000	685823	0.1	Soil	Rock	9	Peaty Soil	0	4	2	0	Negligible
241	268987	685826	0.1	Soil	Rock	11	Peaty Soil	0	6	2	0	Negligible
242	268979	685826	0.1	Soil	Rock	13	Peaty Soil	0	6	2	0	Negligible
243	268966	685803	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
244	268967	685814	0.1	Soil	Rock	11	Peaty Soil	0	6	2	0	Negligible
245	268966	685824	0.1	Soil	Rock	12	Peaty Soil	0	6	2	0	Negligible
246	268961	685825	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
247	268960	685812	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
248	268958	685804	0.1	Soil	Rock	3	Peaty Soil	0	2	2	0	Negligible
249	269217	686520	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
250	269209	686543	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
251	269170	686537	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
252	269165	686556	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
253	269136	686557	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
254	269119	686550	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
255	269118	686569	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
256	269070	686564	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
257	269064	686584	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
258	269023	686571	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
259	269015	686591	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
260	268971	686586	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
261	268969	686603	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
262	268925	686598	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
263	268924	686614	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
264	268880	686615	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
265	268873	686628	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
266	268824	686633	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
267	268827	686618	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
268	268780	686611	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
269	268782	686595	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
270	268743	686567	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
271	268738	686584	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
272	268704	686540	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
273	268696	686555	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
274	268660	686507	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
275	268657	686525	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
276	268622	686491	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
277	268625	686473	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
278	268598	686448	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
279	268603	686423	0.1	Soil	Granular	19	Peaty Soil	0	2	1	0	Negligible
280	268584	686400	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
281	268571	686354	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
282	268555	686302	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
283	268537	686254	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
284	268558	686260	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
285	268537	686207	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
286	268555	686212	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
287	268553	686161	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
288	268547	686114	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
289	268530	686104	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
290	268522	686055	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
291	268523	686006	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
292	268540	686012	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
293	268530	685955	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
294	268545	685960	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
295	268531	685906	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
296	268547	685911	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
297	268535	685867	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
298	268515	685858	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
299	268499	685810	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
300	268518	685818	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
301	268483	685764	0.1	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
302	268499	685771	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
303	268480	685716	0.1	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
304	268497	685721	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
305	268523	685683	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
306	268511	685673	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
307	268539	685636	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
308	268556	685643	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
309	268572	685598	0.1	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
310	268587	685605	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
311	268605	685559	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
312	268620	685567	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
313	268641	685524	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
314	268657	685533	0.1	Soil	Granular	15	Peaty Soil	0	6	1	0	Negligible
315	268678	685492	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
316	268693	685498	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
317	268714	685457	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
318	268729	685463	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
319	268743	685416	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
320	268760	685423	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
321	268770	685378	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
322	268786	685383	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
323	268801	685338	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
324	268816	685343	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
325	268839	685301	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
326	268825	685293	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
327	268866	685259	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
328	268898	685221	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
329	268883	685209	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
330	268914	685174	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
331	268930	685180	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
332	268962	685142	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
333	268948	685133	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
334	268983	685102	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
335	269002	685110	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
336	269024	685073	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
337	269042	685082	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
338	269084	685055	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
339	269066	685044	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
340	269107	685017	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
341	269121	685024	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
342	269144	684985	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
343	269163	684991	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
344	269186	684949	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
345	269169	684940	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
346	269199	684899	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
347	269215	684906	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
348	269223	684856	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
349	269258	684816	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
350	269236	684758	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
351	269233	684710	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
352	269252	684720	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
353	269258	684664	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
354	269273	684672	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
355	269283	684622	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
356	269297	684628	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
357	269333	684597	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
358	269319	684589	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
359	269365	684577	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
360	269386	684595	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
361	269417	684583	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
362	269437	684597	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
363	269465	684572	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
364	269485	684584	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
365	269512	684559	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
366	269529	684567	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
367	269554	684530	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
368	269570	684539	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
369	269589	684497	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
370	269604	684503	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
371	269616	684453	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
372	269629	684459	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
373	269641	684410	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
374	269656	684418	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
375	269676	684374	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
376	269693	684382	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
377	269716	684343	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
378	269756	684313	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
379	269772	684323	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
380	269810	684291	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
381	269793	684283	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
382	269856	684271	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
383	269888	684251	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
384	269905	684263	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
385	268569	686302	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
386	268580	686299	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
387	268577	686312	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
388	268582	686327	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
389	268596	686307	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
390	268621	686314	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
391	268607	686295	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
392	268644	686295	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
393	268665	686291	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
394	268653	686276	1.0	Peat	Granular	5	Thin Peat	3	4	1	12	Low
395	268684	686265	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
396	268693	686246	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
397	268707	686260	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
398	268727	686242	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
399	268739	686231	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
400	268754	686250	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
401	268776	686245	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
402	268788	686236	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
403	268801	686266	0.5	Peat	Granular	4	Thin Peat	3	2	1	6	Low
404	268820	686268	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
405	268830	686263	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
406	268837	686299	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
407	268856	686302	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
408	268867	686298	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
409	268875	686333	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
410	268892	686336	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
411	268902	686331	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
412	268911	686366	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
413	268930	686370	0.3	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
414	268939	686366	0.3	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
415	268952	686396	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
416	268973	686392	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
417	268986	686385	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
418	269001	686405	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
419	269023	686395	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
420	269036	686385	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
421	269050	686405	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
422	269058	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
423	269073	686395	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
424	269068	686384	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
425	269077	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
426	269087	686385	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
427	269098	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
428	269099	686405	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
429	269098	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
430	269108	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
431	269118	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
432	269128	686414	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
433	269127	686404	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
434	269138	686404	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
435	269150	686404	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
436	269168	686403	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
437	269157	686404	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
438	269148	686414	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
439	269168	686414	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
440	269157	686414	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
441	269140	686412	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
442	269108	686404	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
443	269118	686403	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
444	269108	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
445	269117	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
446	269128	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
447	269123	686395	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
448	269138	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
449	269136	686385	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
450	269128	686364	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
451	269128	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
452	269137	686364	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
453	269138	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
454	269148	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
455	269158	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
456	269158	686373	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
457	269149	686364	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
458	269148	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
459	269149	686374	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
460	269157	686354	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
461	269158	686364	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
462	269168	686354	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
463	269168	686364	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
464	269168	686374	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
465	269168	686384	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
466	269173	686394	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
467	269177	686364	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
468	269188	686364	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
469	269178	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
470	269178	686383	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
471	269188	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
472	269187	686384	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
473	269184	686379	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
474	269200	686404	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
475	269222	686392	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
476	269221	686379	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
477	269228	686396	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
478	270188	685574	0.9	Peat	Granular	7	Thin Peat	3	4	1	12	Low
479	270158	685564	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
480	270168	685564	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
481	270178	685564	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
482	270179	685574	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
483	270189	685564	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
484	270197	685570	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
485	270198	685565	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
486	270208	685564	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
487	270218	685565	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
488	270218	685554	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
489	270222	685550	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
490	270228	685554	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
491	270228	685544	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
492	270238	685554	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
493	270238	685544	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
494	270218	685544	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
495	270228	685534	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
496	270218	685534	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
497	270228	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
498	270218	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
499	270218	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
500	270198	685535	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
501	270198	685544	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
502	270198	685505	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
503	270208	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
504	270198	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
505	270207	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
506	270198	685523	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
507	270208	685535	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
508	270208	685544	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
509	270208	685553	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
510	270147	685555	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
511	270178	685554	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
512	270168	685555	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
513	270158	685554	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
514	270198	685554	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
515	270188	685554	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
516	270139	685545	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
517	270147	685535	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
518	270158	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
519	270167	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
520	270188	685544	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
521	270189	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
522	270188	685524	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
523	270188	685514	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
524	270180	685543	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
525	270178	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
526	270178	685523	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
527	270178	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
528	270149	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
529	270168	685544	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
530	270168	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
531	270158	685544	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
532	270148	685545	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
533	270159	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
534	270158	685504	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
535	270148	685505	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
536	270159	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
537	270148	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
538	270139	685515	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
539	270138	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
540	270139	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
541	270128	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
542	270128	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
543	269206	685788	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
544	269210	685799	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
545	269212	685808	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
546	269255	685788	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
547	269259	685797	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
548	269261	685809	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
549	269303	685804	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
550	269304	685818	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
551	269307	685829	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
552	269344	685830	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
553	269346	685841	0.6	Peat	Granular	7	Thin Peat	3	4	1	12	Low
554	269350	685855	1.0	Peat	Granular	7	Thin Peat	3	4	1	12	Low
555	269378	685840	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
556	269383	685856	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
557	269402	685819	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
558	269412	685820	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
559	269402	685867	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
560	269408	685883	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
561	269419	685883	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
562	269400	685893	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
563	269416	685892	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
564	269428	685893	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
565	269437	685914	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
566	269428	685904	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
567	269427	685914	0.8	Peat	Granular	7	Thin Peat	3	4	1	12	Low
568	269428	685924	0.8	Peat	Granular	8	Thin Peat	3	4	1	12	Low
569	269418	685924	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
570	269418	685935	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
571	269417	685945	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
572	269428	685954	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
573	269439	685953	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
574	269448	685944	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
575	269438	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
576	269428	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
577	269438	685925	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
578	269428	685934	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
579	269450	685925	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
580	269448	685934	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
581	269438	685934	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
582	269438	685964	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
583	269447	685963	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
584	269449	685953	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
585	269459	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
586	269444	685956	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
587	269458	685964	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
588	269469	685944	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
589	269468	685954	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
590	269458	685954	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
591	269448	685973	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
592	269458	685974	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
593	269459	685985	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
594	269468	685984	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
595	269468	685974	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
596	269468	685964	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
597	269476	685962	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
598	269478	685954	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
599	269488	685963	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
600	269489	685974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
601	269498	685974	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
602	269508	685984	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
603	269458	685934	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
604	269488	685984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
605	269478	685984	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
606	269478	685974	0.8	Peat	Granular	9	Thin Peat	3	4	1	12	Low
607	269468	685994	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
608	269478	685994	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
609	269519	685974	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
610	269508	685964	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
611	269498	685953	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
612	269508	685954	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
613	269518	685953	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
614	269514	685955	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
615	269527	685954	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
616	269538	685954	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
617	269488	685954	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
618	269498	685964	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
619	269508	685974	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
620	269268	686464	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
621	269268	686474	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
622	269269	686455	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
623	269268	686443	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
624	269269	686434	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
625	269269	686423	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
626	269278	686424	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
627	269278	686435	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
628	269277	686444	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
629	269278	686455	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
630	269279	686464	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
631	269279	686472	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
632	269287	686464	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
633	269288	686454	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
634	269288	686445	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
635	269289	686434	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
636	269289	686425	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
637	269298	686425	0.6	Peat	Granular	2	Thin Peat	3	2	1	6	Low
638	269298	686434	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
639	269299	686444	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
640	269298	686453	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
641	269297	686464	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
642	269308	686464	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
643	269308	686456	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
644	269307	686444	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
645	269308	686433	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
646	269307	686426	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
647	269308	686414	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
648	269318	686413	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
649	269318	686424	0.6	Peat	Granular	2	Thin Peat	3	1	1	3	Negligible
650	269318	686433	0.8	Peat	Granular	1	Thin Peat	3	1	1	3	Negligible
651	269318	686444	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
652	269318	686454	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
653	270036	685341	0.5	Soil	Granular	10	Thin Peat	3	6	1	18	Medium
654	270020	685354	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
655	270036	685366	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
656	270042	685403	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
657	270057	685386	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
658	270058	685411	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
659	270048	685458	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
660	270047	685473	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
661	270070	685460	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
662	270077	685432	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
663	270093	685445	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
664	270088	685465	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
665	270111	685471	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
666	270106	685474	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
667	270117	685473	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
668	270117	685465	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
669	270128	685473	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
670	270130	685477	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
671	270129	685483	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
672	270118	685485	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
673	270129	685494	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
674	270124	685500	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
675	270138	685483	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
676	270137	685495	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
677	270129	685504	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
678	270118	685514	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
679	270118	685524	0.5	Soil	Granular	6	Thin Peat	3	4	1	12	Low
680	270129	685514	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
681	270138	685503	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
682	270149	685495	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
683	269031	685972	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
684	269028	685964	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
685	269021	685956	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
686	269063	685939	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
687	269060	685926	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
688	269055	685920	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
689	269094	685890	0.6	Rock	Granular	7	Thin Peat	3	4	1	12	Low
690	269093	685883	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
691	269099	685901	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
692	269125	685848	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
693	269134	685855	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
694	269134	685869	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
695	269170	685836	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
696	269167	685823	0.5	Soil	Granular	8	Thin Peat	3	4	1	12	Low
697	269162	685815	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
698	269403	685867	1.0	Peat	Granular	6	Thin Peat	3	4	1	12	Low
699	269418	685886	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
700	269429	685894	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
701	269439	685901	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
702	269438	685904	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
703	269449	685904	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
704	269449	685914	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
705	269459	685913	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
706	269457	685924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
707	269468	685923	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
708	269475	685936	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
709	269478	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
710	269468	685934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
711	269479	685925	0.7	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
712	269488	685914	0.8	Peat	Granular	10	Thin Peat	3	6	1	18	Medium
713	269489	685905	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
714	269488	685924	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
715	269498	685914	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
716	269498	685924	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
717	269488	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
718	269489	685943	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
719	269478	685944	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
720	269500	685933	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
721	269507	685924	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
722	269498	685944	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
723	269508	685944	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
724	269519	685944	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
725	269529	685944	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
726	269507	685933	0.5	Soil	Granular	11	Thin Peat	3	6	1	18	Medium
727	269518	685924	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
728	269518	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
729	269927	684303	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
730	269928	684294	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
731	269928	684285	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
732	269928	684274	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
733	269928	684264	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
734	269938	684303	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
735	269947	684305	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
736	269959	684304	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
737	269968	684305	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
738	269939	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
739	269938	684283	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
740	269939	684274	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
741	269939	684264	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
742	269948	684264	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
743	269959	684262	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
744	269948	684274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
745	269948	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
746	269948	684284	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
747	269958	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
748	269959	684284	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
749	269958	684274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
750	269969	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
751	269978	684303	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
752	269989	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
753	270018	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
754	270008	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
755	269998	684305	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
756	269998	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
757	269988	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
758	269978	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
759	269968	684284	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
760	269978	684284	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
761	269988	684283	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
762	269968	684275	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
763	269978	684274	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
764	269969	684264	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
765	269968	684254	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
766	269979	684265	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
767	270029	684304	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
768	270028	684293	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
769	270019	684294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
770	270009	684294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
771	270018	684284	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
772	270008	684284	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
773	269998	684283	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
774	269989	684274	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
775	269999	684275	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
776	270009	684273	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
777	270016	684274	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
778	269989	684263	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
779	269979	684254	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
780	269988	684253	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
781	269998	684264	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
782	270009	684263	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
783	269997	684248	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
784	269999	684254	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
785	270019	684266	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
786	270605	685267	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
787	270611	685276	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
788	270647	685233	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
789	270647	685223	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
790	270658	685234	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
791	270668	685244	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
792	270678	685254	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
793	270668	685274	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
794	270688	685281	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
795	270678	685285	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
796	270689	685293	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
797	270479	685013	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
798	270467	685014	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
799	270467	685024	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
800	270458	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
801	270458	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
802	270458	685014	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
803	270448	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
804	270448	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
805	270448	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
806	270438	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
807	270439	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
808	270437	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
809	270429	685025	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
810	270428	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
811	270428	685003	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
812	270428	684994	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
813	270438	685004	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
814	270438	684993	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
815	270449	685004	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
816	270449	684995	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
817	270458	685004	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
818	270458	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
819	270467	685004	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
820	270469	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
821	270478	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
822	270478	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
823	270488	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
824	270488	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
825	270498	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
826	270499	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
827	270508	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
828	270528	684984	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
829	270517	684974	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
830	270518	684984	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
831	270509	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
832	270509	684985	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
833	270498	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
834	270498	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
835	270488	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
836	270488	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
837	270478	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
838	270478	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
839	270468	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
840	270469	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
841	270457	684974	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
842	270459	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
843	270448	684974	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
844	270449	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
845	270439	684974	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
846	270428	684984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
847	270438	684984	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
848	270418	684984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
849	270428	684974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
850	270418	684974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
851	270418	684964	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
852	270419	684954	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
853	270428	684945	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
854	270418	684944	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
855	270428	684964	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
856	270428	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
857	270438	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
858	270438	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
859	270448	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
860	270448	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
861	270458	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
862	270459	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
863	270468	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
864	270469	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
865	270478	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
866	270478	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
867	270488	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
868	270489	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
869	270498	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
870	270498	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
871	270508	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
872	270508	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
873	270521	684965	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
874	270508	684943	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
875	270498	684934	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
876	270497	684944	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
877	270488	684934	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
878	270489	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
879	270478	684935	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
880	270478	684943	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
881	270469	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
882	270468	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
883	270458	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
884	270458	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
885	270448	684935	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
886	270448	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
887	270418	684934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
888	270428	684934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
889	270439	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
890	270438	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
891	270408	684924	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
892	270417	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
893	270428	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
894	270438	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
895	270448	684924	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
896	270458	684924	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
897	270468	684924	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
898	270478	684923	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
899	270488	684924	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
900	270498	684923	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
901	270507	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
902	270642	685253	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
903	270605	685268	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
904	270612	685275	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
905	270645	685233	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
906	270648	685234	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
907	270647	685224	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
908	270658	685233	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
909	270668	685244	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
910	270679	685254	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
911	270686	685253	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
912	270679	685263	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
913	270668	685275	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
914	270677	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
915	270678	685274	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
916	270685	685269	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
917	270688	685264	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
918	270698	685264	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
919	270688	685275	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
920	270689	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
921	270698	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
922	270697	685295	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
923	270688	685294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
924	270708	685294	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
925	270708	685274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
926	270718	685264	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
927	270708	685303	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
928	270720	685314	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
929	270728	685312	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
930	270729	685304	1.3	Peat	Granular	3	Thin Peat	3	2	1	6	Low
931	270718	685304	1.2	Peat	Granular	3	Thin Peat	3	2	1	6	Low
932	270719	685293	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
933	270488	684884	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
934	270478	684894	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
935	270488	684894	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
936	270500	684910	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
937	270488	684904	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
938	270478	684904	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
939	270470	684902	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
940	270458	684904	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
941	270449	684906	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
942	270438	684903	0.5	Soil	Granular	9	Thin Peat	3	4	1	12	Low
943	270420	684915	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
944	270429	684915	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
945	270438	684914	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
946	270447	684913	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
947	270458	684914	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
948	270468	684913	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
949	270478	684914	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
950	270488	684913	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
951	270757	685311	1.8	Peat	Granular	2	Thick Peat	2	2	1	4	Negligible
952	270748	685303	1.8	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
953	270747	685294	1.8	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
954	269984	684024	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
955	270052	684212	0.3	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
956	269933	684256	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
957	269738	684329	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
958	269596	684482	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
959	269402	684589	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
960	269237	684794	0.2	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
961	269146	685010	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
962	268974	685122	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
963	268826	685318	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
964	268675	685490	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
965	268465	685732	0.9	Soil	Granular	1	Thin Peat	3	1	1	3	Negligible
966	268537	685931	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
967	268537	686146	0.7	Soil	Granular	5	Thin Peat	3	2	1	6	Low
968	268595	686384	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
969	268684	686541	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
970	268902	686607	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
971	269145	686554	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
972	269248	686496	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
973	269255	686285	1.1	Peat	Granular	5	Thin Peat	3	4	1	12	Low
974	269205	686134	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
975	269139	686108	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
976	269067	686027	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
977	269061	685905	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
978	268972	685768	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
979	269158	685617	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
980	269389	685527	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
981	269571	685510	0.1	Soil	Rock	14	Peaty Soil	0	6	2	0	Negligible
982	269649	685488	0.0	ROCK	Rock	8	No Peat	0	4	2	0	None
983	269677	686339	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
984	269676	686304	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
985	269705	686241	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
986	269701	686198	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
987	269686	686159	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
988	269674	686104	0.8	Soil	Granular	11	Thin Peat	3	6	1	18	Medium
989	269659	686072	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
990	269622	686041	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
991	269580	686012	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
992	269503	685986	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
993	269461	686004	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
994	269421	685983	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
995	269401	686130	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
996	269322	686026	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
997	269237	686075	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
998	269380	686161	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
999	269329	686188	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1000	269299	686207	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1001	269200	686299	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1002	269162	686299	1.2	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1003	269095	686298	0.9	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1004	269030	686299	0.9	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1005	268956	686174	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1006	268971	686282	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1007	268913	686248	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1008	268839	686205	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1009	268823	686223	0.8	Soil	Granular	4	Thin Peat	3	2	1	6	Low
1010	268796	686265	0.5	Soil	Granular	4	Thin Peat	3	2	1	6	Low
1011	268757	686300	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1012	268722	686332	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1013	268696	686374	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1014	268781	686373	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1015	268731	686400	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1016	268863	686441	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1017	268778	686443	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1018	268898	686404	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1019	268956	686392	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1020	269017	686368	0.4	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1021	268828	686503	0.3	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1022	268681	686445	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1023	268920	686514	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1024	269017	686528	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1025	268776	686552	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1026	269021	686465	0.3	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1027	269129	686476	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1028	269137	686385	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1029	269257	686365	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1030	269249	686413	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1031	269304	686317	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1032	269320	686301	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1033	269289	686277	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1034	269330	686243	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1035	269358	686409	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1036	269358	686323	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1037	269401	686225	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1038	269383	686276	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1039	269422	686332	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1040	269403	686409	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1041	269431	686256	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1042	269447	686320	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1043	269501	686323	0.9	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1044	269477	686384	1.0	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1045	269507	686266	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1046	269571	686192	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1047	269495	686131	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1048	269529	686325	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1049	269610	686241	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1050	269612	686150	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1051	269568	686333	0.7	Soil	Granular	5	Thin Peat	3	4	1	12	Low
1052	269499	686483	0.6	Peat	Granular	10	Thin Peat	3	6	1	18	Medium
1053	269904	685259	0.1	Soil	Rock	5	Peaty Soil	0	2	2	0	Negligible
1054	269485	686425	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1055	269661	686343	0.6	Soil	Granular	4	Thin Peat	3	2	1	6	Low
1056	269924	686323	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1057	270175	686310	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1058	270291	686279	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1059	270394	686278	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1060	270719	686229	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1061	270543	686262	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1062	270941	686180	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1063	271099	686080	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1064	271208	686202	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1065	271353	686138	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1066	271499	686033	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1067	271374	685931	1.0	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1068	271215	685869	0.9	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1069	271101	685761	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1070	270929	685625	0.5	Soil	Granular	4	Thin Peat	3	2	1	6	Low
1071	270817	685475	0.9	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1072	270671	685309	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1073	270578	685117	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1074	270520	684930	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1075	270411	684724	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1076	270313	684527	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1077	270062	684433	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1078	270023	684696	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1079	270248	684807	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1080	270374	685009	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1081	270319	685200	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1082	270677	685585	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1083	270517	685560	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1084	270783	685705	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1085	270921	685865	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1086	270802	685894	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1087	270659	685994	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1088	270559	685970	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1089	270518	685895	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1090	270416	685853	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1091	270303	685849	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1092	270203	685908	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1093	270183	686005	0.4	Peat	Granular	7	Peaty Soil	0	4	1	0	Negligible
1094	270216	685869	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1095	270193	685841	0.7	Peat	Granular	12	Thin Peat	3	6	1	18	Medium
1096	270077	685890	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
1097	270021	685915	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
1098	269954	685954	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
1099	269885	685995	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1100	269785	686011	0.3	Peat	Granular	7	Peaty Soil	0	4	1	0	Negligible
1101	269722	686066	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1102	269712	686094	0.0	Soil	Granular	12	No Peat	0	6	1	0	None
1103	269734	686148	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1104	269757	686217	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1105	269788	686283	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1106	269815	686344	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1107	269341	685556	0.1	Soil	Granular	15	Peaty Soil	0	6	1	0	Negligible
1108	269247	685555	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1109	269354	685458	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1110	269246	685461	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1111	269357	685358	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1112	269453	685350	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1113	269440	685463	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1114	269146	685460	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1115	269147	685359	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1116	269261	685355	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1117	269345	685277	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1118	269431	685253	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1119	269245	685259	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1120	269339	685164	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1121	269235	685170	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1122	269145	685270	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1123	269038	685263	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1124	269038	685361	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1125	269132	685162	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1126	269237	685050	0.3	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1127	269045	685162	0.3	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1128	268941	685052	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1129	268932	685147	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1130	268845	685053	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1131	268733	685045	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1132	268851	685155	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1133	268746	685142	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1134	268943	685251	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1135	268638	685145	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1136	268840	685245	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1137	268738	685251	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1138	268630	685252	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1139	268451	685356	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1140	268550	685343	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1141	268544	685252	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1142	268438	685545	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1143	268456	685451	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1144	268534	685450	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1145	268743	685340	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1146	268943	685345	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1147	268845	685345	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1148	268837	685454	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1149	268742	685455	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1150	268642	685343	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1151	268947	685455	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1152	268949	685548	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1153	268845	685550	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1154	268649	685448	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1155	268741	685546	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1156	268640	685558	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1157	268543	685547	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1158	268639	685656	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1159	268537	685654	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1160	268738	685654	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1161	268430	685643	0.2	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
1162	268344	685554	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1163	268443	685752	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1164	268543	685755	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1165	268633	685746	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1166	268739	685745	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1167	268841	685635	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1168	269029	685048	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1169	269027	685154	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1170	269137	685059	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1171	269040	684952	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1172	269128	684954	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1173	269039	684854	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1174	269042	684756	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1175	269123	684851	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1176	269136	684769	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1177	269125	684657	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1178	269147	684573	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1179	269232	684955	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1180	269249	684868	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1181	269238	684652	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1182	269328	684854	0.2	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1183	269340	684962	0.3	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1184	269333	684762	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1185	269341	684658	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1186	269331	684552	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1187	269439	684554	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1188	269435	684445	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1189	269530	684454	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1190	269540	684356	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1191	269540	684557	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1192	269635	684344	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1193	269644	684457	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1194	269738	684356	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1195	269734	684451	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1196	269736	684551	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1197	269626	684551	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1198	269454	684607	0.6	Peat	Granular	7	Thin Peat	3	4	1	12	Low
1199	269437	684646	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1200	269437	684753	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1201	269528	684657	0.5	Peat	Granular	7	Thin Peat	3	4	1	12	Low
1202	269596	684684	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1203	269634	684651	0.5	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1204	269733	684652	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1205	269738	684748	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1206	269745	684852	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1207	269643	684748	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1208	269642	684853	0.5	Peat	Granular	9	Thin Peat	3	4	1	12	Low
1209	269567	684723	0.9	Peat	Granular	9	Thin Peat	3	4	1	12	Low
1210	269439	684849	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1211	269539	684752	0.5	Peat	Granular	9	Thin Peat	3	4	1	12	Low
1212	269541	684851	0.2	Soil	Granular	19	Peaty Soil	0	2	1	0	Negligible
1213	269447	684949	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1214	269547	684947	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1215	269650	684952	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1216	269744	684953	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1217	269739	685049	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1218	269639	685146	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1219	269640	685052	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1220	269549	685047	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1221	269534	685150	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1222	269528	685253	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1223	269633	685237	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1224	269436	685046	0.3	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
1225	269442	685158	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1226	269345	685056	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1227	268930	684946	0.3	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1228	268739	684956	0.2	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1229	268839	684959	0.3	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
1230	268840	684852	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1231	268937	684852	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1232	269535	684245	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1233	269631	684247	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1234	269629	684153	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1235	268343	685636	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1236	268228	685656	0.3	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1237	268240	685747	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1238	268335	685749	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1239	268835	685745	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1240	268934	685649	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1241	269035	685440	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1242	269028	685540	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1243	269133	685550	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1244	268933	685756	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1245	268736	685860	0.2	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1246	269038	685643	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1247	268836	685848	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1248	268936	685851	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1249	269538	684150	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1250	269251	684756	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1251	270133	685351	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1252	270045	685342	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1253	270330	685367	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1254	270245	685353	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1255	270248	685457	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1256	270143	685440	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1257	270330	685450	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1258	270423	685456	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1259	270426	685552	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1260	270325	685552	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1261	270350	685654	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1262	270435	685657	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1263	270538	685653	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1264	270666	685633	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1265	270349	685733	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1266	270421	685763	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1267	270541	685733	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1268	270729	685751	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1269	270843	685851	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1270	270638	685756	0.4	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1271	270337	685955	0.1	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1272	270256	685960	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1273	270643	685837	0.5	Soil	Granular	13	Thin Peat	3	6	1	18	Medium
1274	270737	685846	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1275	270432	685952	0.5	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1276	270441	686060	0.3	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1277	270547	686046	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1278	270337	686059	0.2	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1279	270240	686058	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1280	270139	686054	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1281	270136	685955	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1282	270042	686041	0.5	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1283	270044	685964	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
1284	269931	686056	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1285	269925	686079	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1286	269839	686053	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1287	269648	686011	0.5	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
1288	269548	685961	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1289	269645	685953	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1290	269731	685959	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1291	269830	685921	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1292	269545	685868	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1293	269430	685865	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1294	269633	685847	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1295	269430	685753	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1296	269544	685748	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1297	270699	685911	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1298	269447	685934	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1299	269343	685857	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1300	269228	685955	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1301	269149	685958	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1302	269141	686042	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1303	269333	685755	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1304	269346	685639	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1305	269240	685849	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1306	269225	685741	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1307	269247	685643	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1308	269147	685849	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1309	269128	685743	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1310	269068	685734	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1311	269145	685658	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1312	269434	685660	0.2	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1313	269537	685659	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1314	269464	685551	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1315	269541	685557	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1316	269350	685572	0.1	Soil	Granular	25	Peaty Soil	0	2	1	0	Negligible
1317	269334	685932	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1318	269741	685458	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1319	269642	685543	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1320	269736	685552	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1321	269731	685651	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1322	269648	685659	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1323	269633	685752	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1324	269771	685712	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1325	269733	685745	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1326	269752	685833	0.5	Peat	Granular	7	Thin Peat	3	4	1	12	Low
1327	269841	685842	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1328	269842	685759	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1329	269935	685833	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1330	269851	685541	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1331	269833	685643	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1332	270042	685834	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1333	269955	685751	0.1	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1334	270043	685742	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1335	270140	685771	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1336	270249	685749	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1337	269952	685659	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1338	270044	685650	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1339	270147	685642	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1340	270243	685663	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1341	269971	685559	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1342	270047	685557	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1343	270138	685545	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1344	270237	685530	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1345	269833	685465	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1346	269954	685452	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1347	270051	685448	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1348	269747	685377	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1349	269844	685347	0.1	Soil	Granular	19	Peaty Soil	0	2	1	0	Negligible
1350	269936	685347	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1351	270626	685912	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1352	269732	685253	0.1	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1353	269813	685246	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1354	269662	685260	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1355	269626	685355	0.1	Soil	Granular	20	Peaty Soil	0	2	1	0	Negligible
1356	269548	685442	0.1	Soil	Granular	15	Peaty Soil	0	6	1	0	Negligible
1357	269538	685360	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1358	269447	685450	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1359	271033	686057	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
1360	271035	686114	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1361	270943	686043	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1362	270832	686151	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1363	270838	686040	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1364	270938	685942	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1365	270838	685943	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1366	270747	686031	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1367	270745	685952	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1368	270037	685237	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1369	270141	685217	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1370	270244	685223	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1371	268883	686328	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1372	268757	686489	0.3	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1373	268828	686303	0.9	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1374	269860	686149	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1375	269976	686142	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1376	269853	686246	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1377	269944	686246	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1378	270053	686140	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1379	270054	686243	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1380	270143	686147	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1381	270141	686245	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1382	270263	686236	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1383	270348	686144	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1384	270346	686232	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1385	270446	686157	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1386	270551	686149	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1387	270454	686231	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1388	270650	686064	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1389	270747	686134	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1390	270648	686152	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1391	269062	686166	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1392	269147	686225	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1393	269043	686238	0.6	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1394	268644	686249	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1395	268641	686156	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1396	268637	686048	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1397	268636	685946	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1398	268649	685853	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1399	268736	686152	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1400	268738	686254	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1401	268739	686052	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1402	268739	685951	0.3	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1403	268940	686652	1.6	Peat	Granular	4	Thick Peat	2	2	1	4	Negligible
1404	269036	686653	2.1	Peat	Granular	5	Thick Peat	2	4	1	8	Low
1405	269130	686651	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1406	269240	686646	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1407	269239	686756	0.4	Soil	Rock	2	Peaty Soil	0	1	2	0	Negligible
1408	269135	686755	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1409	268940	686758	1.1	Peat	Granular	2	Thin Peat	3	1	1	3	Negligible
1410	269041	686761	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1411	270029	686551	1.5	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1412	270140	686454	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1413	270139	686554	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1414	271439	685956	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1415	271536	685953	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1416	271239	685856	0.9	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1417	271340	685853	0.9	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1418	271240	685753	0.9	Peat	Granular	7	Thin Peat	3	4	1	12	Low
1419	271138	685754	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1420	271040	685658	0.4	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
1421	270938	685551	0.9	Peat	Granular	0	Thin Peat	3	1	1	3	Negligible
1422	270942	685452	1.6	Peat	Granular	2	Thick Peat	2	1	1	2	Negligible
1423	270851	685447	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1424	270838	685353	1.3	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1425	270740	685251	1.5	Peat	Granular	1	Thin Peat	3	1	1	3	Negligible
1426	270739	685351	1.6	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
1427	270835	685253	1.9	Peat	Granular	4	Thick Peat	2	2	1	4	Negligible
1428	270639	685154	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1429	270743	685157	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1430	270237	684452	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1431	270338	684553	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1432	270338	684457	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1433	270240	684359	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1434	270137	684356	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1435	270142	684252	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1436	270048	684349	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1437	270139	684157	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1438	270140	684053	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1439	270039	684054	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1440	268547	686258	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1441	268449	686247	0.6	Peat	Granular	0	Thin Peat	3	1	1	3	Negligible
1442	268336	686149	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1443	268441	685852	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1444	268341	685858	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1445	268439	686145	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1446	268441	686048	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1447	268449	685952	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1448	268334	685949	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1449	268941	686050	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1450	268944	685951	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1451	268839	685950	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1452	268844	686056	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1453	268842	686151	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1454	269137	686147	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1455	269239	686156	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1456	268540	686053	0.2	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1457	268541	686346	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1458	268448	686349	0.4	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
1459	268444	686450	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1460	268542	686448	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1461	268340	686047	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1462	268551	686547	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1463	268631	686559	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1464	268647	686653	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1465	268737	686764	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1466	268738	686647	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1467	268845	686648	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1468	268844	686750	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1469	268536	685851	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1470	270039	686354	0.2	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1471	270045	686446	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1472	269837	686550	1.2	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1473	269744	686555	1.5	Peat	Granular	6	Thin Peat	3	4	1	12	Low
1474	269844	686453	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1475	269938	686358	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1476	269841	686357	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1477	269940	686453	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1478	269745	686456	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1479	269644	686457	0.4	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1480	269544	686459	0.8	Peat	Granular	10	Thin Peat	3	4	1	12	Low
1481	269640	686559	0.9	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
1482	269541	686648	0.9	Peat	Granular	1	Thin Peat	3	1	1	3	Negligible
1483	269550	686565	0.6	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1484	269444	686662	1.0	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1485	269443	686555	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1486	269347	686558	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1487	269249	686562	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1488	269246	686748	0.8	Peat	Granular	2	Thin Peat	3	1	1	3	Negligible
1489	269342	686662	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1490	269248	686658	0.7	Peat	Granular	1	Thin Peat	3	1	1	3	Negligible
1491	269333	686443	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1492	269927	686543	1.5	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1493	270139	686357	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1494	270439	686353	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1495	270333	686351	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1496	270235	686353	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1497	270241	686451	0.9	Peat	Granular	15	Thin Peat	3	6	1	18	Medium
1498	270340	686449	1.0	Peat	Granular	20	Thin Peat	3	2	1	6	Low
1499	270440	686453	1.2	Peat	Granular	14	Thin Peat	3	6	1	18	Medium
1500	270532	686449	1.0	Peat	Granular	12	Thin Peat	3	6	1	18	Medium
1501	270532	686352	1.2	Peat	Granular	9	Thin Peat	3	4	1	12	Low
1502	271036	686257	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1503	270844	686250	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1504	270933	686251	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1505	270639	686255	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1506	271142	686358	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1507	271045	686355	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1508	270632	686357	0.5	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
1509	270740	686354	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1510	270839	686354	0.6	Peat	Granular	9	Thin Peat	3	4	1	12	Low
1511	270945	686351	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1512	270639	686455	0.9	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
1513	270741	686460	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1514	270847	686454	0.6	Peat	Granular	10	Thin Peat	3	6	1	18	Medium
1515	270942	686448	0.5	Peat	Granular	14	Thin Peat	3	6	1	18	Medium
1516	271234	686350	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1517	271128	686256	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1518	271041	686164	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1519	271135	686158	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1520	271331	686259	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1521	271441	686154	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1522	271242	686261	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1523	271345	686060	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1524	271240	686064	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1525	271246	686158	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1526	271147	686059	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1527	271343	685957	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1528	271244	685950	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1529	271145	685959	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1530	271044	685950	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1531	269840	685158	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1532	269947	685154	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1533	269748	685165	0.2	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible
1534	270246	685154	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1535	271348	685853	0.8	Peat	Granular	5	Thin Peat	3	2	1	6	Low
1536	271442	685854	0.9	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1537	270037	685173	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1538	270150	685152	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1539	270246	685053	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1540	270140	685058	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1541	270043	685049	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1542	269947	685056	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1543	269842	685056	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1544	270145	684952	0.3	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible
1545	270239	684957	0.2	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
1546	270341	685058	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1547	270044	684958	0.2	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
1548	269941	684956	0.3	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible
1549	269852	684949	0.3	Soil	Granular	19	Peaty Soil	0	2	1	0	Negligible
1550	271135	685860	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1551	271040	685856	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1552	271038	685759	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1553	270940	685759	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1554	270841	685757	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1555	270840	685660	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1556	270736	685657	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1557	270841	685561	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1558	270846	685629	0.9	Peat	Granular	2	Thin Peat	3	2	1	6	Low
1559	270814	685634	1.0	Peat	Granular	4	Thin Peat	3	2	1	6	Low
1560	270940	685664	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1561	270741	685553	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1562	270734	685453	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1563	270658	685457	0.5	Peat	Granular	7	Thin Peat	3	4	1	12	Low
1564	270644	685359	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1565	270644	685547	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1566	270542	685451	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1567	270452	685357	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1568	270535	685358	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1569	270540	685264	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1570	270638	685256	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1571	270535	685152	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1572	270351	685245	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1573	270444	685060	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1574	270538	685049	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1575	270441	685149	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1576	270438	685251	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1577	270147	684860	0.2	Soil	Granular	16	Peaty Soil	0	2	1	0	Negligible
1578	270245	684864	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1579	270039	684867	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1580	269855	684846	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1581	269843	684761	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1582	269846	684667	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1583	270051	684763	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1584	269935	684860	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1585	269948	684750	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1586	269939	684652	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1587	270443	684762	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1588	270440	684959	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1589	270436	684849	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1590	270336	684859	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1591	270340	684756	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1592	270540	684858	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1593	270337	684959	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1594	269842	684556	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1595	269942	684565	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1596	270038	684556	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1597	270240	684755	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1598	270142	684750	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1599	270038	684457	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1600	270639	685056	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1601	270636	684952	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1602	270541	684955	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1603	270249	684554	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1604	270248	684669	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1605	270151	684663	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1606	270050	684648	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1607	270146	684552	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1608	270146	684459	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1609	269941	684467	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1610	269840	684451	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1611	269938	684360	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1612	269847	684356	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1613	269841	684253	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1614	269743	684262	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1615	269838	684155	0.3	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1616	269948	684156	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1617	269746	684161	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1618	269942	684065	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1619	269840	684059	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1620	269743	684058	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1621	270335	684665	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1622	269963	684024	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1623	269981	684049	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1624	269968	684071	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1625	270000	684108	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1626	270008	684094	0.1	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1627	270044	684122	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1628	270033	684149	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1629	270052	684170	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1630	270031	684198	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1631	270031	684238	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1632	270032	684272	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1633	270047	684305	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1634	270029	684314	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1635	270022	684363	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1636	270038	684404	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1637	270021	684413	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1638	270075	684435	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1639	270101	684453	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1640	270175	684428	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1641	270153	684446	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1642	270219	684450	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1643	270200	684460	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1644	270253	684484	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1645	270238	684492	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1646	270292	684517	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1647	270273	684524	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1648	270320	684556	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1649	270306	684565	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1650	270345	684598	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1651	270331	684606	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1652	270371	684643	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1653	270354	684649	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1654	270404	684682	0.0	Soil	Granular	4	No Peat	0	2	1	0	None
1655	270386	684689	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1656	270426	684725	0.1	Soil	Granular	18	Peaty Soil	0	2	1	0	Negligible
1657	270407	684734	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1658	270422	684781	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1659	270449	684824	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1660	270466	684813	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1661	270497	684853	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1662	270479	684860	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1663	270520	684900	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1664	270562	685008	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1665	270545	685012	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1666	269258	686444	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1667	269258	686434	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1668	269268	686424	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1669	269288	686415	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1670	269298	686414	0.6	Soil	Granular	2	Thin Peat	3	1	1	3	Negligible
1671	269315	686406	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1672	269327	686404	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1673	269338	686395	0.5	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1674	269349	686393	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1675	269357	686395	0.7	Peat	Granular	5	Thin Peat	3	4	1	12	Low
1676	269358	686425	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
1677	269363	686438	0.2	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
1678	269339	686424	0.2	Soil	Rock	3	Peaty Soil	0	2	2	0	Negligible
1679	269340	686415	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1680	269338	686406	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1681	269347	686406	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1682	269349	686416	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1683	269349	686425	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1684	269349	686434	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1685	269357	686434	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1686	269358	686444	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1687	269349	686444	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1688	269349	686454	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1689	269339	686434	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1690	269339	686445	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1691	269339	686453	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1692	269328	686454	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1693	269329	686445	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1694	269329	686435	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1695	269329	686424	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1696	269329	686415	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1697	269318	686474	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1698	270575	685053	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1699	270556	685056	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1700	270563	685107	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1701	270578	685103	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1702	270593	685152	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1703	270575	685156	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1704	270622	685195	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1705	270605	685200	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1706	269343	686493	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1707	269316	686499	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1708	269309	686485	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1709	269336	686476	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1710	269278	686495	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1711	269263	686516	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1712	269233	686478	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1713	269247	686452	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1714	269228	686432	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1715	269242	686396	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1716	269224	686328	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1717	269221	686285	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1718	269237	686262	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1719	269214	686234	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1720	269230	686215	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1721	269207	686183	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1722	269242	686318	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1723	269226	686164	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1724	269199	686120	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1725	269187	686135	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1726	269161	686093	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1727	269121	686061	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1728	269110	686074	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1729	269082	686029	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1730	269069	686043	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1731	269866	685278	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1732	269835	685269	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1733	269880	685254	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1734	269911	685272	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1735	269857	685276	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1736	269925	685256	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1737	269960	685286	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1738	269971	685273	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1739	270018	685295	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1740	270007	685309	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1741	269819	685299	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1742	269791	685297	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1743	269781	685327	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1744	269752	685330	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1745	269746	685365	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1746	269718	685363	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1747	269712	685402	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1748	269685	685404	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1749	269684	685443	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1750	269656	685449	0.1	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
1751	269658	685486	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1752	269630	685487	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1753	269620	685515	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1754	269584	685503	0.1	Soil	Granular	17	Peaty Soil	0	2	1	0	Negligible
1755	269570	685524	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1756	269534	685511	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1757	269520	685531	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1758	269488	685516	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1759	269474	685536	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1760	269439	685517	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1761	269420	685534	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1762	269386	685516	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1763	269371	685541	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1764	269337	685535	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1765	269329	685560	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1766	269296	685558	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1767	269282	685584	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1768	269251	685580	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1769	269237	685607	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1770	269217	685607	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1771	269210	685601	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1772	269114	685643	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1773	269070	685662	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1774	269191	685627	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1775	269104	685668	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1776	269054	685691	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1777	269024	685684	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1778	269010	685710	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1779	268986	685715	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1780	268964	685762	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1781	268944	685806	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1782	268964	685848	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1783	268982	685898	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1784	269002	685943	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1785	268970	685901	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1786	268987	685947	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1787	269035	686007	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1788	268969	685784	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1789	268967	685794	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
1790	268978	685796	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1791	268978	685784	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1792	268979	685773	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1793	268978	685765	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
1794	268977	685804	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1795	268977	685814	0.0	Rock	Rock	11	No Peat	0	6	2	0	None
1796	268987	685754	0.0	Rock	Rock	7	No Peat	0	4	2	0	None
1797	268988	685763	0.0	Rock	Rock	5	No Peat	0	4	2	0	None
1798	268989	685775	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1799	268989	685785	0.0	Rock	Rock	4	No Peat	0	2	2	0	None
1800	268987	685794	0.0	Rock	Rock	10	No Peat	0	4	2	0	None
1801	268988	685804	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1802	268989	685813	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1803	268998	685804	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
1804	268996	685794	0.0	Rock	Rock	18	No Peat	0	2	2	0	None
1805	268997	685783	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1806	268998	685774	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1807	268999	685764	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
1808	268997	685754	0.0	Rock	Rock	11	No Peat	0	6	2	0	None
1809	269008	685755	0.0	Rock	Rock	8	No Peat	0	4	2	0	None
1810	269008	685763	0.0	Rock	Rock	15	No Peat	0	2	2	0	None
1811	269010	685775	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1812	269009	685783	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1813	269008	685794	0.0	Rock	Rock	6	No Peat	0	4	2	0	None
1814	269008	685804	0.0	Rock	Rock	24	No Peat	0	2	2	0	None
1815	269017	685804	0.0	Rock	Rock	23	No Peat	0	2	2	0	None
1816	269019	685793	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1817	269018	685784	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1818	269019	685774	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1819	269017	685765	0.0	Rock	Rock	19	No Peat	0	2	2	0	None
1820	269019	685754	0.0	Rock	Rock	8	No Peat	0	4	2	0	None
1821	269028	685765	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1822	269027	685774	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
1823	269028	685784	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
1824	269029	685795	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
1825	269029	685803	0.0	Rock	Rock	10	No Peat	0	6	2	0	None
1826	269029	685813	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
1827	269040	685763	0.0	Rock	Rock	30	No Peat	0	2	2	0	None
1828	269038	685773	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1829	269037	685785	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
1830	269038	685794	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1831	269039	685803	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1832	269039	685814	0.0	Rock	Rock	41	No Peat	0	2	2	0	None
1833	269049	685813	0.0	Rock	Rock	44	No Peat	0	2	2	0	None
1834	269058	685813	0.0	Rock	Rock	39	No Peat	0	2	2	0	None
1835	269047	685803	0.0	Rock	Rock	2	No Peat	0	1	2	0	None
1836	269048	685793	0.0	Rock	Rock	3	No Peat	0	2	2	0	None
1837	269048	685784	0.0	Rock	Rock	2	No Peat	0	2	2	0	None
1838	269048	685772	0.0	Rock	Rock	9	No Peat	0	4	2	0	None
1839	269048	685763	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
1840	269057	685765	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
1841	269057	685775	0.0	Rock	Rock	29	No Peat	0	2	2	0	None
1842	269059	685783	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
1843	269060	685793	0.0	Rock	Rock	44	No Peat	0	2	2	0	None
1844	269058	685803	0.0	Rock	Rock	43	No Peat	0	2	2	0	None
1845	269069	685763	0.0	Rock	Rock	10	No Peat	0	4	2	0	None
1846	269068	685775	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
1847	269068	685784	0.0	Rock	Rock	37	No Peat	0	2	2	0	None
1848	269066	685793	0.0	Rock	Rock	32	No Peat	0	2	2	0	None
1849	269070	685806	0.1	Soil	Rock	18	Peaty Soil	0	2	2	0	Negligible
1850	269067	685813	0.1	Soil	Rock	12	Peaty Soil	0	6	2	0	Negligible
1851	269067	685823	0.1	Soil	Rock	7	Peaty Soil	0	4	2	0	Negligible
1852	269057	685823	0.1	Soil	Rock	7	Peaty Soil	0	4	2	0	Negligible
1853	269048	685825	0.1	Soil	Rock	5	Peaty Soil	0	2	2	0	Negligible
1854	269039	685824	0.1	Soil	Rock	5	Peaty Soil	0	4	2	0	Negligible
1855	269029	685824	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
1856	269018	685816	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
1857	269009	685814	0.1	Soil	Rock	10	Peaty Soil	0	4	2	0	Negligible
1858	269018	685824	0.1	Soil	Rock	9	Peaty Soil	0	4	2	0	Negligible
1859	269009	685824	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
1860	269001	685813	0.1	Soil	Rock	10	Peaty Soil	0	6	2	0	Negligible
1861	269000	685823	0.1	Soil	Rock	9	Peaty Soil	0	4	2	0	Negligible
1862	268987	685826	0.1	Soil	Rock	11	Peaty Soil	0	6	2	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1863	268979	685826	0.1	Soil	Rock	13	Peaty Soil	0	6	2	0	Negligible
1864	268966	685803	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
1865	268967	685814	0.1	Soil	Rock	11	Peaty Soil	0	6	2	0	Negligible
1866	268966	685824	0.1	Soil	Rock	12	Peaty Soil	0	6	2	0	Negligible
1867	268961	685825	0.1	Soil	Rock	8	Peaty Soil	0	4	2	0	Negligible
1868	268960	685812	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
1869	268958	685804	0.1	Soil	Rock	3	Peaty Soil	0	2	2	0	Negligible
1870	269217	686520	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1871	269209	686543	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1872	269170	686537	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1873	269165	686556	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1874	269136	686557	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1875	269119	686550	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1876	269118	686569	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1877	269070	686564	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1878	269064	686584	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1879	269023	686571	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1880	269015	686591	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1881	268971	686586	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1882	268969	686603	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1883	268925	686598	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1884	268924	686614	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1885	268880	686615	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1886	268873	686628	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1887	268824	686633	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1888	268827	686618	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1889	268780	686611	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1890	268782	686595	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1891	268743	686567	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1892	268738	686584	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1893	268704	686540	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1894	268696	686555	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1895	268660	686507	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1896	268657	686525	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1897	268622	686491	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1898	268625	686473	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1899	268598	686448	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1900	268603	686423	0.1	Soil	Granular	19	Peaty Soil	0	2	1	0	Negligible
1901	268584	686400	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1902	268571	686354	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1903	268555	686302	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1904	268537	686254	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1905	268558	686260	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1906	268537	686207	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1907	268555	686212	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1908	268553	686161	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1909	268547	686114	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1910	268530	686104	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1911	268522	686055	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1912	268523	686006	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1913	268540	686012	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1914	268530	685955	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1915	268545	685960	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1916	268531	685906	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1917	268547	685911	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1918	268535	685867	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1919	268515	685858	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1920	268499	685810	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1921	268518	685818	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1922	268483	685764	0.1	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
1923	268499	685771	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1924	268480	685716	0.1	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
1925	268497	685721	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
1926	268523	685683	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1927	268511	685673	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1928	268539	685636	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1929	268556	685643	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1930	268572	685598	0.1	Soil	Granular	15	Peaty Soil	0	2	1	0	Negligible
1931	268587	685605	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1932	268605	685559	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1933	268620	685567	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1934	268641	685524	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1935	268657	685533	0.1	Soil	Granular	15	Peaty Soil	0	6	1	0	Negligible
1936	268678	685492	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1937	268693	685498	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1938	268714	685457	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1939	268729	685463	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1940	268743	685416	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1941	268760	685423	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1942	268770	685378	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1943	268786	685383	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1944	268801	685338	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1945	268816	685343	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1946	268839	685301	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1947	268825	685293	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1948	268866	685259	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1949	268898	685221	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1950	268883	685209	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1951	268914	685174	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1952	268930	685180	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1953	268962	685142	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1954	268948	685133	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1955	268983	685102	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1956	269002	685110	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
1957	269024	685073	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1958	269042	685082	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1959	269084	685055	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1960	269066	685044	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
1961	269107	685017	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1962	269121	685024	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1963	269144	684985	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1964	269163	684991	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1965	269186	684949	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1966	269169	684940	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
1967	269199	684899	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1968	269215	684906	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1969	269223	684856	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1970	269258	684816	0.1	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
1971	269236	684758	0.1	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
1972	269233	684710	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1973	269252	684720	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1974	269258	684664	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1975	269273	684672	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1976	269283	684622	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1977	269297	684628	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1978	269333	684597	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
1979	269319	684589	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1980	269365	684577	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1981	269386	684595	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1982	269417	684583	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1983	269437	684597	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1984	269465	684572	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1985	269485	684584	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
1986	269512	684559	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
1987	269529	684567	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
1988	269554	684530	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1989	269570	684539	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
1990	269589	684497	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1991	269604	684503	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
1992	269616	684453	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1993	269629	684459	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1994	269641	684410	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1995	269656	684418	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
1996	269676	684374	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
1997	269693	684382	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
1998	269716	684343	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
1999	269756	684313	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2000	269772	684323	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2001	269810	684291	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2002	269793	684283	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2003	269856	684271	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2004	269888	684251	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2005	269905	684263	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2006	268569	686302	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2007	268580	686299	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2008	268577	686312	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2009	268582	686327	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2010	268596	686307	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2011	268621	686314	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
2012	268607	686295	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
2013	268644	686295	0.9	Peat	Granular	5	Thin Peat	3	2	1	6	Low
2014	268665	686291	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2015	268653	686276	1.0	Peat	Granular	5	Thin Peat	3	4	1	12	Low
2016	268684	686265	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2017	268693	686246	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2018	268707	686260	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2019	268727	686242	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2020	268739	686231	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2021	268754	686250	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2022	268776	686245	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2023	268788	686236	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2024	268801	686266	0.5	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2025	268820	686268	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2026	268830	686263	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2027	268837	686299	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2028	268856	686302	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2029	268867	686298	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2030	268875	686333	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2031	268892	686336	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2032	268902	686331	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2033	268911	686366	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
2034	268930	686370	0.3	Soil	Granular	0	Peaty Soil	0	1	1	0	Negligible
2035	268939	686366	0.3	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
2036	268952	686396	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
2037	268973	686392	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2038	268986	686385	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2039	269001	686405	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2040	269023	686395	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2041	269036	686385	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2042	269050	686405	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2043	269058	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2044	269073	686395	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2045	269068	686384	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2046	269077	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2047	269087	686385	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2048	269098	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2049	269099	686405	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2050	269098	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2051	269108	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2052	269118	686414	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2053	269128	686414	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2054	269127	686404	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2055	269138	686404	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2056	269150	686404	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2057	269168	686403	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2058	269157	686404	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2059	269148	686414	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2060	269168	686414	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2061	269157	686414	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2062	269140	686412	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2063	269108	686404	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2064	269118	686403	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2065	269108	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2066	269117	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2067	269128	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2068	269123	686395	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2069	269138	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2070	269136	686385	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2071	269128	686364	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2072	269128	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2073	269137	686364	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2074	269138	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2075	269148	686354	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2076	269158	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2077	269158	686373	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2078	269149	686364	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2079	269148	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2080	269149	686374	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2081	269157	686354	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2082	269158	686364	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2083	269168	686354	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2084	269168	686364	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2085	269168	686374	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2086	269168	686384	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2087	269173	686394	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2088	269177	686364	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2089	269188	686364	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2090	269178	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2091	269178	686383	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2092	269188	686374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2093	269187	686384	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2094	269184	686379	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2095	269200	686404	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2096	269222	686392	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2097	269221	686379	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2098	269228	686396	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2099	270188	685574	0.9	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2100	270158	685564	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2101	270168	685564	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2102	270178	685564	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2103	270179	685574	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2104	270189	685564	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2105	270197	685570	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2106	270198	685565	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2107	270208	685564	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2108	270218	685565	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2109	270218	685554	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2110	270222	685550	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2111	270228	685554	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2112	270228	685544	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2113	270238	685554	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2114	270238	685544	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2115	270218	685544	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2116	270228	685534	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2117	270218	685534	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2118	270228	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2119	270218	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2120	270218	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2121	270198	685535	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2122	270198	685544	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2123	270198	685505	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2124	270208	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2125	270198	685514	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2126	270207	685524	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2127	270198	685523	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2128	270208	685535	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2129	270208	685544	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2130	270208	685553	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2131	270147	685555	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2132	270178	685554	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2133	270168	685555	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2134	270158	685554	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2135	270198	685554	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2136	270188	685554	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2137	270139	685545	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2138	270147	685535	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2139	270158	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2140	270167	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2141	270188	685544	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2142	270189	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2143	270188	685524	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2144	270188	685514	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2145	270180	685543	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2146	270178	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2147	270178	685523	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2148	270178	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2149	270149	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2150	270168	685544	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2151	270168	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2152	270158	685544	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2153	270148	685545	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2154	270159	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2155	270158	685504	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2156	270148	685505	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2157	270159	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2158	270148	685514	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2159	270139	685515	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2160	270138	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2161	270139	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2162	270128	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2163	270128	685534	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2164	269206	685788	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2165	269210	685799	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2166	269212	685808	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2167	269255	685788	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2168	269259	685797	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2169	269261	685809	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2170	269303	685804	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2171	269304	685818	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2172	269307	685829	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2173	269344	685830	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2174	269346	685841	0.6	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2175	269350	685855	1.0	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2176	269378	685840	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2177	269383	685856	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2178	269402	685819	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2179	269412	685820	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2180	269402	685867	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2181	269408	685883	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2182	269419	685883	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2183	269400	685893	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2184	269416	685892	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2185	269428	685893	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2186	269437	685914	0.9	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2187	269428	685904	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2188	269427	685914	0.8	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2189	269428	685924	0.8	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2190	269418	685924	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2191	269418	685935	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2192	269417	685945	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2193	269428	685954	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2194	269439	685953	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2195	269448	685944	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2196	269438	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2197	269428	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2198	269438	685925	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2199	269428	685934	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2200	269450	685925	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2201	269448	685934	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2202	269438	685934	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2203	269438	685964	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2204	269447	685963	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2205	269449	685953	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2206	269459	685944	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2207	269444	685956	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2208	269458	685964	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2209	269469	685944	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2210	269468	685954	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2211	269458	685954	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2212	269448	685973	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2213	269458	685974	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2214	269459	685985	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2215	269468	685984	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2216	269468	685974	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2217	269468	685964	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2218	269476	685962	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2219	269478	685954	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2220	269488	685963	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2221	269489	685974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2222	269498	685974	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2223	269508	685984	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2224	269458	685934	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2225	269488	685984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2226	269478	685984	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2227	269478	685974	0.8	Peat	Granular	9	Thin Peat	3	4	1	12	Low
2228	269468	685994	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2229	269478	685994	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2230	269519	685974	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
2231	269508	685964	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2232	269498	685953	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2233	269508	685954	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2234	269518	685953	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2235	269514	685955	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2236	269527	685954	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2237	269538	685954	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2238	269488	685954	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2239	269498	685964	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2240	269508	685974	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2241	269268	686464	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2242	269268	686474	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2243	269269	686455	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2244	269268	686443	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2245	269269	686434	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2246	269269	686423	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2247	269278	686424	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2248	269278	686435	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2249	269277	686444	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2250	269278	686455	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2251	269279	686464	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2252	269279	686472	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2253	269287	686464	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2254	269288	686454	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2255	269288	686445	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2256	269289	686434	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2257	269289	686425	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2258	269298	686425	0.6	Peat	Granular	2	Thin Peat	3	2	1	6	Low
2259	269298	686434	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2260	269299	686444	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2261	269298	686453	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2262	269297	686464	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2263	269308	686464	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2264	269308	686456	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2265	269307	686444	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2266	269308	686433	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
2267	269307	686426	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
2268	269308	686414	0.4	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
2269	269318	686413	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2270	269318	686424	0.6	Peat	Granular	2	Thin Peat	3	1	1	3	Negligible
2271	269318	686433	0.8	Peat	Granular	1	Thin Peat	3	1	1	3	Negligible
2272	269318	686444	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
2273	269318	686454	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2274	270036	685341	0.5	Soil	Granular	10	Thin Peat	3	6	1	18	Medium
2275	270020	685354	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2276	270036	685366	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2277	270042	685403	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2278	270057	685386	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2279	270058	685411	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2280	270048	685458	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2281	270047	685473	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2282	270070	685460	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2283	270077	685432	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2284	270093	685445	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2285	270088	685465	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2286	270111	685471	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2287	270106	685474	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2288	270117	685473	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2289	270117	685465	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2290	270128	685473	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2291	270130	685477	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2292	270129	685483	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2293	270118	685485	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2294	270129	685494	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2295	270124	685500	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2296	270138	685483	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2297	270137	685495	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2298	270129	685504	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2299	270118	685514	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2300	270118	685524	0.5	Soil	Granular	6	Thin Peat	3	4	1	12	Low
2301	270129	685514	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2302	270138	685503	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2303	270149	685495	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2304	269031	685972	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2305	269028	685964	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2306	269021	685956	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2307	269063	685939	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2308	269060	685926	0.3	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2309	269055	685920	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2310	269094	685890	0.6	Rock	Granular	7	Thin Peat	3	4	1	12	Low
2311	269093	685883	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2312	269099	685901	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2313	269125	685848	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2314	269134	685855	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2315	269134	685869	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2316	269170	685836	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2317	269167	685823	0.5	Soil	Granular	8	Thin Peat	3	4	1	12	Low
2318	269162	685815	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2319	269403	685867	1.0	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2320	269418	685886	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2321	269429	685894	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2322	269439	685901	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2323	269438	685904	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2324	269449	685904	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2325	269449	685914	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2326	269459	685913	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2327	269457	685924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2328	269468	685923	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2329	269475	685936	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2330	269478	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2331	269468	685934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2332	269479	685925	0.7	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
2333	269488	685914	0.8	Peat	Granular	10	Thin Peat	3	6	1	18	Medium
2334	269489	685905	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2335	269488	685924	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2336	269498	685914	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2337	269498	685924	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2338	269488	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2339	269489	685943	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2340	269478	685944	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2341	269500	685933	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2342	269507	685924	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2343	269498	685944	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2344	269508	685944	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2345	269519	685944	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2346	269529	685944	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2347	269507	685933	0.5	Soil	Granular	11	Thin Peat	3	6	1	18	Medium
2348	269518	685924	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2349	269518	685934	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2350	269927	684303	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2351	269928	684294	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2352	269928	684285	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2353	269928	684274	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2354	269928	684264	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2355	269938	684303	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2356	269947	684305	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2357	269959	684304	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2358	269968	684305	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2359	269939	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2360	269938	684283	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2361	269939	684274	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2362	269939	684264	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2363	269948	684264	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2364	269959	684262	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2365	269948	684274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2366	269948	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2367	269948	684284	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2368	269958	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2369	269959	684284	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2370	269958	684274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2371	269969	684294	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2372	269978	684303	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2373	269989	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2374	270018	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2375	270008	684304	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2376	269998	684305	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2377	269998	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2378	269988	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2379	269978	684293	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2380	269968	684284	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2381	269978	684284	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2382	269988	684283	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2383	269968	684275	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2384	269978	684274	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2385	269969	684264	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2386	269968	684254	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2387	269979	684265	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2388	270029	684304	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2389	270028	684293	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2390	270019	684294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2391	270009	684294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2392	270018	684284	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2393	270008	684284	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2394	269998	684283	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2395	269989	684274	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2396	269999	684275	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2397	270009	684273	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2398	270016	684274	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2399	269989	684263	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2400	269979	684254	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2401	269988	684253	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2402	269998	684264	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2403	270009	684263	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2404	269997	684248	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2405	269999	684254	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2406	270019	684266	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2407	270605	685267	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2408	270611	685276	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2409	270647	685233	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2410	270647	685223	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2411	270658	685234	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2412	270668	685244	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2413	270678	685254	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2414	270668	685274	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2415	270688	685281	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2416	270678	685285	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2417	270689	685293	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2418	270479	685013	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2419	270467	685014	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2420	270467	685024	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2421	270458	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2422	270458	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2423	270458	685014	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2424	270448	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2425	270448	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2426	270448	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2427	270438	685034	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2428	270439	685024	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2429	270437	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2430	270429	685025	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2431	270428	685014	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2432	270428	685003	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2433	270428	684994	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2434	270438	685004	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2435	270438	684993	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2436	270449	685004	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2437	270449	684995	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2438	270458	685004	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2439	270458	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2440	270467	685004	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2441	270469	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2442	270478	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2443	270478	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2444	270488	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2445	270488	684993	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2446	270498	685003	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2447	270499	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2448	270508	684994	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2449	270528	684984	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2450	270517	684974	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2451	270518	684984	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2452	270509	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2453	270509	684985	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2454	270498	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2455	270498	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2456	270488	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2457	270488	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2458	270478	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2459	270478	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2460	270468	684975	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2461	270469	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2462	270457	684974	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2463	270459	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2464	270448	684974	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2465	270449	684984	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2466	270439	684974	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2467	270428	684984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2468	270438	684984	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2469	270418	684984	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2470	270428	684974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2471	270418	684974	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2472	270418	684964	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2473	270419	684954	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2474	270428	684945	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2475	270418	684944	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2476	270428	684964	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2477	270428	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2478	270438	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2479	270438	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2480	270448	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2481	270448	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2482	270458	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2483	270459	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2484	270468	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2485	270469	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2486	270478	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2487	270478	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2488	270488	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2489	270489	684954	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2490	270498	684963	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2491	270498	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2492	270508	684953	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2493	270508	684964	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2494	270521	684965	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2495	270508	684943	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2496	270498	684934	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2497	270497	684944	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2498	270488	684934	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2499	270489	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2500	270478	684935	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2501	270478	684943	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2502	270469	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2503	270468	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2504	270458	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2505	270458	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2506	270448	684935	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2507	270448	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2508	270418	684934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2509	270428	684934	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2510	270439	684934	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2511	270438	684944	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2512	270408	684924	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2513	270417	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2514	270428	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2515	270438	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2516	270448	684924	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2517	270458	684924	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2518	270468	684924	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2519	270478	684923	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2520	270488	684924	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2521	270498	684923	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2522	270507	684924	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2523	270642	685253	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2524	270605	685268	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2525	270612	685275	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2526	270645	685233	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2527	270648	685234	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2528	270647	685224	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2529	270658	685233	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2530	270668	685244	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2531	270679	685254	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2532	270686	685253	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2533	270679	685263	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2534	270668	685275	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2535	270677	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2536	270678	685274	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2537	270685	685269	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2538	270688	685264	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2539	270698	685264	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2540	270688	685275	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2541	270689	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2542	270698	685284	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2543	270697	685295	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2544	270688	685294	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2545	270708	685294	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2546	270708	685274	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2547	270718	685264	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2548	270708	685303	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2549	270720	685314	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2550	270728	685312	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2551	270729	685304	1.3	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2552	270718	685304	1.2	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2553	270719	685293	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2554	270488	684884	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2555	270478	684894	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2556	270488	684894	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2557	270500	684910	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2558	270488	684904	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2559	270478	684904	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2560	270470	684902	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2561	270458	684904	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2562	270449	684906	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2563	270438	684903	0.5	Soil	Granular	9	Thin Peat	3	4	1	12	Low
2564	270420	684915	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2565	270429	684915	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2566	270438	684914	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2567	270447	684913	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2568	270458	684914	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2569	270468	684913	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2570	270478	684914	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2571	270488	684913	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2572	270757	685311	1.8	Peat	Granular	2	Thick Peat	2	2	1	4	Negligible
2573	270748	685303	1.8	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
2574	270747	685294	1.8	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
2575	269948	684253	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2576	269919	684265	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2577	269919	684275	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2578	269899	684263	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2579	269907	684276	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2580	269898	684274	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2581	269910	684287	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2582	269918	684285	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2583	269897	684283	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2584	269908	684294	0.9	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2585	269916	684296	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2586	269920	684301	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2587	269908	684305	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2588	269900	684336	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2589	269897	684321	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2590	269889	684334	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2591	269880	684334	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2592	269897	684316	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2593	269889	684304	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2594	269878	684286	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2595	269958	684254	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2596	269938	684254	0.0	Soil	Granular	4	No Peat	0	2	1	0	None
2597	269880	684302	0.7	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2598	269879	684294	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2599	269888	684315	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2600	269880	684323	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2601	269890	684324	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2602	269878	684313	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2603	269899	684294	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2604	269898	684303	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2605	269879	684263	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2606	269889	684263	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2607	269879	684272	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2608	269890	684283	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2609	269890	684294	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2610	269889	684273	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2611	270009	684254	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2612	270019	684254	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2613	270516	684887	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2614	270498	684904	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2615	270502	684924	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2616	270513	684940	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2617	270519	684952	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2618	270541	684949	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2619	270561	684996	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2620	270539	684997	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2621	270528	685064	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2622	270529	685075	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2623	270530	685084	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2624	270519	685085	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2625	270518	685094	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2626	270508	685083	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2627	270508	685094	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2628	270509	685076	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2629	270489	685094	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2630	270498	685094	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2631	270498	685084	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2632	270489	685083	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2633	270498	685073	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2634	270508	685066	0.8	Peat	Granular	9	Thin Peat	3	4	1	12	Low
2635	270490	685075	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2636	270476	685064	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2637	270498	685064	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2638	270489	685066	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2639	270519	685066	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2640	270521	685075	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2641	270552	685067	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2642	270708	685344	1.2	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2643	270699	685335	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2644	270698	685343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2645	270698	685323	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2646	270698	685314	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2647	270690	685315	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2648	270689	685304	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2649	270690	685324	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2650	270678	685313	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2651	270669	685313	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2652	270679	685303	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2653	270640	685226	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2654	270637	685225	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2655	270640	685258	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2656	270656	685305	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2657	270624	685247	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2658	270642	685293	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2659	270648	685314	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2660	270637	685322	1.2	Peat	Granular	5	Thin Peat	3	4	1	12	Low
2661	270650	685322	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2662	270658	685324	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2663	270649	685333	0.7	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2664	270657	685333	1.0	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2665	270678	685324	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2666	270673	685321	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2667	270677	685334	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2668	270678	685342	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2669	270647	685343	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2670	270657	685344	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2671	270660	685339	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2672	270687	685335	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2673	270688	685343	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2674	270667	685323	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2675	270576	685097	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2676	270556	685114	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2677	270587	685146	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2678	270574	685162	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2679	270608	685200	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2680	270621	685180	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2681	269853	684278	0.6	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2682	269858	684285	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2683	269849	684285	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2684	269849	684294	0.6	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2685	269848	684304	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2686	269828	684304	0.2	Soil	Granular	1	Peaty Soil	0	1	1	0	Negligible
2687	269828	684314	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2688	269829	684314	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2689	269828	684324	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2690	269838	684334	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2691	269838	684324	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2692	269848	684324	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2693	269858	684324	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2694	269867	684325	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2695	269858	684314	0.2	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
2696	269869	684308	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2697	269848	684334	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2698	269858	684334	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2699	269868	684334	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2700	269829	684334	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2701	269828	684344	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2702	269839	684344	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2703	269848	684344	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2704	269858	684344	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2705	269868	684343	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2706	269867	684315	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2707	269838	684313	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2708	269847	684314	0.3	Soil	Granular	2	Peaty Soil	0	1	1	0	Negligible
2709	269858	684304	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2710	269869	684274	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2711	269868	684283	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2712	269868	684293	0.4	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2713	269859	684294	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2714	269818	684294	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2715	269818	684284	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2716	269828	684284	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2717	269848	684274	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2718	269838	684284	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2719	269828	684294	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2720	269838	684293	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2721	270554	685030	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2722	270550	685035	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2723	270524	685025	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2724	270518	685033	0.8	Peat	Granular	7	Thin Peat	3	4	1	12	Low
2725	270508	685034	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2726	270507	685026	0.5	Peat	Granular	9	Thin Peat	3	4	1	12	Low
2727	270497	685032	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2728	270490	685024	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2729	270488	685034	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2730	270488	685044	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2731	270478	685034	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2732	270479	685053	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2733	270490	685054	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2734	270499	685054	0.9	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2735	270497	685045	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
2736	270507	685042	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2737	270510	685056	0.9	Peat	Granular	9	Thin Peat	3	4	1	12	Low
2738	270517	685052	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2739	270518	685044	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2740	270478	685044	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2741	270468	685035	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2742	270802	685452	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2743	270775	685440	0.9	Peat	Granular	2	Thin Peat	3	2	1	6	Low
2744	270726	685386	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2745	270728	685382	1.4	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2746	270717	685374	1.6	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
2747	270700	685354	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2748	270689	685355	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2749	270685	685362	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2750	270680	685354	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2751	270675	685353	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2752	270671	685354	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2753	270670	685354	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2754	270668	685363	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2755	270661	685367	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2756	270650	685365	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2757	270658	685354	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2758	270671	685372	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2759	270673	685380	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2760	270679	685380	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2761	270669	685393	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2762	270659	685383	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2763	270688	685384	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2764	270693	685377	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2765	270698	685378	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2766	270703	685372	1.7	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
2767	270707	685374	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2768	270706	685365	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2769	270718	685364	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2770	269079	686026	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2771	269083	686011	0.4	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2772	269099	685998	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2773	269112	685966	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2774	269143	685910	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2775	269131	685923	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2776	269153	685879	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2777	269125	685956	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2778	269170	685867	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2779	269181	685838	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2780	269205	685831	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2781	269222	685810	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2782	269272	685799	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2783	269320	685808	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2784	269018	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2785	269029	686384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2786	269049	686384	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2787	269098	686365	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2788	269100	686374	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2789	269110	686364	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2790	269120	686363	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2791	269109	686373	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2792	269120	686374	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2793	269129	686374	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2794	269089	686036	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2795	269115	685994	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2796	269142	685951	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
2797	269166	685911	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2798	269189	685863	0.3	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2799	269227	685827	0.4	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2800	269275	685820	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2801	269322	685833	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2802	269360	685867	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2803	269355	685885	0.5	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2804	269360	685901	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2805	269410	685901	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2806	269517	685964	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
2807	269250	685812	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2808	269299	685812	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2809	269346	685832	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2810	269320	685808	0.3	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2811	269468	685914	0.5	Peat	Granular	10	Thin Peat	3	6	1	18	Medium
2812	269477	685914	0.5	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
2813	269479	685904	0.4	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2814	269458	685894	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2815	269468	685895	0.8	Peat	Granular	11	Thin Peat	3	6	1	18	Medium
2816	269458	685904	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2817	269468	685904	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2818	269437	685898	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2819	269425	685902	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2820	270168	685524	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2821	270188	685504	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2822	270177	685504	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2823	270167	685504	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2824	270158	685494	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2825	270167	685485	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2826	270168	685495	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2827	270179	685494	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2828	270026	685395	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2829	270045	685389	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2830	270022	685343	0.3	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2831	270064	685430	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2832	270055	685436	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2833	270070	685491	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2834	270098	685453	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2835	270118	685493	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2836	270107	685465	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2837	270013	685346	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
2838	269364	685834	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2839	269366	685845	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
2840	269389	685854	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2841	269388	685868	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
2842	269400	685865	0.6	Peat	Granular	6	Thin Peat	3	4	1	12	Low

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2843	269405	685875	0.8	Peat	Granular	6	Thin Peat	3	4	1	12	Low
2844	270698	685364	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2845	270678	685374	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2846	270690	685368	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2847	269938	684343	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2848	269938	684353	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2849	269948	684353	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2850	269958	684353	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2851	269968	684353	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2852	269968	684363	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2853	269988	684363	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2854	269988	684383	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2855	269978	684393	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2856	269968	684403	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2857	269968	684413	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2858	269948	684413	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2859	269948	684403	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2860	269938	684393	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2861	269938	684403	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2862	269948	684393	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2863	269948	684383	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2864	269957	684382	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2865	269968	684383	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2866	269968	684394	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2867	269979	684383	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2868	269978	684373	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2869	269978	684363	0.1	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2870	269979	684354	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2871	269978	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2872	269968	684333	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2873	269958	684333	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2874	269948	684333	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2875	269929	684343	0.8	Peat	Granular	2	Thin Peat	3	2	1	6	Low
2876	269928	684333	0.5	Peat	Granular	2	Thin Peat	3	2	1	6	Low
2877	269918	684324	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2878	269908	684323	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2879	269908	684333	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2880	269898	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2881	269908	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2882	269938	684413	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2883	269958	684414	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2884	269978	684412	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2885	269988	684413	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2886	269978	684403	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2887	269988	684402	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2888	269988	684393	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2889	269959	684403	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2890	269958	684392	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2891	269939	684383	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2892	269938	684373	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2893	269948	684372	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2894	269958	684372	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2895	269968	684373	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2896	269988	684373	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2897	269948	684362	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2898	269958	684363	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2899	269938	684322	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2900	269939	684332	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2901	269948	684323	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2902	269949	684342	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2903	269958	684343	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2904	269969	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2905	269969	684323	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2906	269958	684322	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2907	269978	684322	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2908	269989	684323	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2909	269978	684333	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2910	269989	684333	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2911	269988	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2912	269988	684352	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2913	269918	684343	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2914	269919	684333	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2915	269930	684321	0.4	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
2916	268988	685743	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
2917	269008	685743	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
2918	268998	685743	0.0	Soil	Rock	10	No Peat	0	6	2	0	None
2919	269017	685743	0.0	Soil	Rock	10	No Peat	0	6	2	0	None
2920	269018	685733	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2921	269008	685723	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2922	269019	685723	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2923	269008	685733	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2924	269028	685753	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
2925	269048	685753	0.0	Soil	Rock	12	No Peat	0	6	2	0	None
2926	269038	685753	0.0	Soil	Rock	11	No Peat	0	6	2	0	None
2927	269088	685763	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2928	269088	685773	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2929	269088	685803	0.3	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2930	269028	685733	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2931	269029	685743	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2932	269039	685733	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2933	269039	685743	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2934	269049	685733	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2935	269048	685743	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
2936	269059	685753	0.1	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible
2937	269068	685753	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2938	269079	685753	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2939	269058	685733	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2940	269059	685743	0.2	Soil	Granular	12	Peaty Soil	0	6	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
2941	269069	685743	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2942	269079	685733	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2943	269079	685744	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2944	269099	685744	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2945	269090	685743	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
2946	269099	685753	0.2	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2947	269088	685754	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
2948	269099	685764	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2949	269109	685764	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2950	269108	685774	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2951	269098	685772	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2952	269079	685764	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2953	269079	685774	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
2954	269079	685783	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
2955	269089	685783	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2956	269099	685783	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2957	269098	685794	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2958	269088	685793	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2959	269079	685793	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
2960	269099	685803	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
2961	269080	685803	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
2962	268998	685733	0.1	Soil	Granular	9	Peaty Soil	0	4	1	0	Negligible
2963	269858	684261	0.0	Soil	Granular	4	No Peat	0	2	1	0	None
2964	269855	684260	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2965	269897	684253	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2966	269904	684249	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2967	269908	684253	0.2	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
2968	269918	684253	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2969	269948	684243	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
2970	269959	684244	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2971	269967	684250	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2972	269968	684242	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2973	269886	684342	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2974	269888	684353	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2975	269879	684354	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2976	269876	684362	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2977	269887	684363	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2978	269888	684373	1.2	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2979	269893	684371	1.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2980	269896	684371	1.7	Peat	Granular	3	Thick Peat	2	2	1	4	Negligible
2981	269894	684365	1.1	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2982	269892	684358	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2983	269905	684359	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2984	269921	684364	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2985	269918	684353	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2986	269927	684353	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
2987	269908	684383	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2988	269908	684393	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2989	269906	684398	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2990	269908	684403	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2991	269898	684403	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2992	269879	684343	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2993	269880	684373	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2994	269888	684403	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
2995	269919	684374	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2996	269918	684383	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2997	269928	684383	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2998	269918	684393	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
2999	269928	684393	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3000	269918	684403	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3001	269898	684353	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3002	269908	684353	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3003	269898	684363	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3004	269908	684363	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3005	269928	684373	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3006	269929	684363	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3007	269898	684373	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3008	269908	684373	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3009	269879	684383	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3010	269888	684375	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3011	269887	684384	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3012	269899	684383	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3013	269898	684393	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3014	269888	684393	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3015	269878	684393	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3016	269878	684403	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3017	269878	684412	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3018	269889	684413	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3019	269898	684414	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3020	269908	684413	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3021	269918	684413	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3022	269928	684413	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3023	269929	684404	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3024	268998	685733	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
3025	268978	685843	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3026	268988	685853	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3027	268988	685833	0.0	Soil	Rock	11	No Peat	0	6	2	0	None
3028	269008	685853	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
3029	269018	685853	0.1	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
3030	268998	685833	0.0	Soil	Rock	8	No Peat	0	4	2	0	None
3031	269000	685852	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3032	269028	685853	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3033	269038	685853	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
3034	269048	685853	0.1	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3035	269008	685833	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
3036	269028	685833	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
3037	269038	685833	0.0	Soil	Rock	6	No Peat	0	4	2	0	None
3038	269058	685833	0.0	Soil	Rock	6	No Peat	0	4	2	0	None

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
3039	269068	685833	0.0	Soil	Rock	6	No Peat	0	4	2	0	None
3040	269068	685853	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3041	269058	685853	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3042	268998	685843	0.2	Soil	Granular	13	Peaty Soil	0	6	1	0	Negligible
3043	269018	685843	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
3044	268988	685843	0.2	Soil	Granular	14	Peaty Soil	0	6	1	0	Negligible
3045	268968	685833	0.0	Soil	Rock	11	No Peat	0	6	2	0	None
3046	268958	685833	0.0	Soil	Rock	6	No Peat	0	4	2	0	None
3047	269008	685863	0.2	Soil	Granular	10	Peaty Soil	0	6	1	0	Negligible
3048	269029	685864	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3049	269047	685864	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3050	269068	685863	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3051	269008	685843	0.2	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
3052	269038	685843	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3053	269058	685843	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3054	269078	685843	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3055	268978	685833	0.0	Soil	Rock	11	No Peat	0	6	2	0	None
3056	269048	685833	0.0	Soil	Rock	6	No Peat	0	4	2	0	None
3057	269018	685833	0.0	Soil	Rock	9	No Peat	0	4	2	0	None
3058	268978	685853	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3059	269058	685863	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3060	269088	685853	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3061	269088	685843	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3062	269078	685853	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3063	269088	685833	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3064	269098	685823	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3065	269078	685823	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3066	269088	685823	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3067	269098	685813	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3068	269078	685813	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3069	269088	685813	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3070	269069	685843	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3071	269077	685833	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3072	269018	685863	0.1	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3073	269035	685861	0.2	Soil	Granular	11	Peaty Soil	0	6	1	0	Negligible
3074	269026	685843	0.1	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
3075	269048	685843	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3076	270628	685255	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3077	270631	685261	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3078	270635	685267	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3079	270637	685272	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3080	270636	685276	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3081	270642	685280	0.1	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
3082	270623	685272	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3083	270628	685281	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3084	270627	685294	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3085	270625	685301	0.1	Soil	Rock	6	Peaty Soil	0	4	2	0	Negligible
3086	270634	685313	0.4	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3087	270638	685327	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3088	270640	685348	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3089	270639	685361	0.2	Soil	Rock	7	Peaty Soil	0	4	2	0	Negligible
3090	270643	685366	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3091	270646	685380	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3092	270652	685380	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3093	270657	685380	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3094	270660	685373	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3095	270662	685369	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3096	270644	685359	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3097	270648	685351	0.1	Peat	Granular	6	Peaty Soil	0	4	1	0	Negligible
3098	270642	685335	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3099	270638	685320	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3100	270630	685306	0.1	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3101	270638	685298	0.1	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3102	270647	685296	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3103	270794	685478	0.7	Peat	Granular	2	Thin Peat	3	2	1	6	Low
3104	270758	685507	1.8	Peat	Granular	2	Thick Peat	2	2	1	4	Negligible
3105	270757	685480	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
3106	270736	685474	0.3	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
3107	270741	685463	0.2	Soil	Granular	2	Peaty Soil	0	2	1	0	Negligible
3108	270629	685257	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3109	270611	685266	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3110	270606	685271	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3111	270607	685282	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3112	270608	685292	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3113	270611	685304	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3114	270621	685316	0.4	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3115	270634	685331	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3116	270636	685347	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3117	270637	685359	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3118	270639	685374	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3119	270642	685383	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3120	270644	685393	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3121	270651	685402	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3122	270653	685416	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3123	270656	685428	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3124	270642	685434	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3125	270633	685420	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3126	270626	685411	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3127	270620	685400	0.1	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3128	270618	685388	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3129	270617	685364	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3130	270628	685293	0.3	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3131	270628	685275	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3132	270616	685374	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3133	270611	685319	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3134	270612	685328	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3135	270613	685344	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3136	270615	685352	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible

ID	X	Y	Depth	Surface	Substrate	Slope	Peat Coefficient	Peat Coefficient	Slope Coefficient	Substrate Coefficient	Risk Coefficient	Potential Instability
3137	270612	685334	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3138	270641	685413	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3139	270637	685403	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3140	270632	685391	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3141	270627	685374	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3142	270627	685360	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3143	270626	685345	0.2	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3144	270625	685332	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3145	270622	685297	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3146	270673	685322	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3147	270677	685334	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3148	270682	685346	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3149	270687	685346	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3150	270705	685374	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3151	270708	685372	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3152	270692	685363	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3153	270680	685344	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3154	270648	685301	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3155	270628	685311	0.4	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3156	270636	685321	0.2	Soil	Granular	5	Peaty Soil	0	4	1	0	Negligible
3157	270700	685308	0.9	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3158	270720	685301	1.0	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3159	270012	684411	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3160	270011	684401	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3161	270011	684381	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3162	270013	684369	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3163	270014	684357	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3164	270015	684348	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3165	270014	684342	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3166	270015	684333	0.1	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3167	270015	684322	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3168	270006	684314	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3169	269997	684313	0.2	Peat	Granular	3	Peaty Soil	0	2	1	0	Negligible
3170	269987	684315	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3171	269970	684315	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3172	269939	684314	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3173	269959	684312	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3174	270016	684314	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3175	270012	684423	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3176	270011	684393	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3177	269979	684314	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3178	269947	684315	0.4	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3179	269995	684422	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3180	269980	684423	0.5	Peat	Granular	8	Thin Peat	3	4	1	12	Low
3181	269969	684422	0.2	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3182	269958	684423	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3183	269949	684424	0.5	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3184	269939	684422	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3185	269927	684423	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3186	269907	684423	0.7	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3187	269918	684423	0.6	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3188	269897	684424	0.9	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3189	269887	684423	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3190	269876	684421	0.4	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3191	269877	684429	0.5	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3192	269884	684432	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3193	269895	684433	0.7	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3194	269904	684432	0.8	Peat	Granular	4	Thin Peat	3	2	1	6	Low
3195	269918	684431	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3196	269927	684428	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3197	269938	684430	0.5	Peat	Granular	6	Thin Peat	3	4	1	12	Low
3198	269947	684432	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3199	269958	684429	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3200	269969	684429	0.3	Soil	Granular	10	Peaty Soil	0	4	1	0	Negligible
3201	269981	684428	0.2	Soil	Granular	8	Peaty Soil	0	4	1	0	Negligible
3202	269989	684429	0.3	Soil	Granular	7	Peaty Soil	0	4	1	0	Negligible
3203	269986	684423	0.3	Soil	Granular	6	Peaty Soil	0	4	1	0	Negligible
3204	269996	684430	0.3	Soil	Granular	5	Peaty Soil	0	2	1	0	Negligible
3205	269997	684414	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3206	269997	684405	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3207	269998	684393	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3208	269998	684382	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3209	269998	684373	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3210	269998	684363	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3211	269997	684353	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3212	269997	684343	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3213	269998	684333	0.3	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3214	269998	684324	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3215	270006	684324	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3216	270007	684334	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3217	270005	684345	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3218	270006	684355	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3219	270004	684368	0.2	Soil	Granular	3	Peaty Soil	0	2	1	0	Negligible
3220	270003	684382	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3221	270005	684394	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3222	270003	684408	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3223	270003	684423	0.2	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3224	270003	684432	0.3	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3225	270012	684433	0.1	Soil	Granular	4	Peaty Soil	0	2	1	0	Negligible
3226	270699	685373	0.7	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3227	270702	685373	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3228	270701	685370	0.6	Peat	Granular	3	Thin Peat	3	2	1	6	Low
3229	270718	685376	0.8	Peat	Granular	3	Thin Peat	3	2	1	6	Low

Annex B Peat Coring Data

Technical Appendix 10.1: Peat Landslide Hazard Risk Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

SLR Project No.: 428.V12085.00001

Peat Core Log

Hole No. **PC01**

Sheet 1 of 1

Project: Cairnoch Hill Wind Farm	Client: Eurowind Energy Limited		Dates: 30-04-2026
Project No: 428.V12085.00001	Logger: LB	Approved By: RW	Coordinates: E: 270724.18 N: 685324.64
Location: Carron Valley	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 0.50	C	0.00 - 0.50	Recovery = 100%	0.40			Dark brown PEAT with ocassional wood chunks. (H3/B3).
	0.50 - 1.00	C	0.50 - 1.00	Recovery = 100%	1.00			Very soft brown peaty SILT with occasional wood chunks and rootlets.
								Peat Core Complete at 1.00m

Remarks:

Peat Core Log

Hole No.
PC02
Sheet 1 of 1

Project: Cairnoch Hill Wind Farm	Client: Eurowind Energy Limited		Dates: 30-04-2026
Project No: 428.V12085.00001	Logger: LB	Approved By: RW	Coordinates: E: 270693.13 N: 685355.25
Location: Carron Valley	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 0.50	C	0.00 - 0.50	Recovery = 100%	0.35			Dark brown silty PEAT with rare wood chunks. (H3/B2).
					0.50			Very soft brownish grey SILT with occasional rootlets.
								Peat Core Complete at 0.50m

1
2
3
4
5

Remarks:

Peat Core Log

Hole No. **PC03**

Sheet 1 of 1

Project: Cairnoch Hill Wind Farm	Client: Eurowind Energy Limited		Dates: 30-04-2026
Project No: 428.V12085.00001	Logger: LB	Approved By: RW	Coordinates: E: 270702.43 N: 685370.05
Location: Carron Valley	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 0.50	C	0.00 - 0.50	Recovery = 100%	0.40			Brown pseudo fibrous PEAT with occasional wood chunks. (H5/B3)
	0.50 - 1.00	C	0.50 - 1.00	Recovery = 100%	0.85			Very soft light brown SILT with occasional wood chunks and rootlets.
					1.00			Soft brownish grey clayey SILT.
								Peat Core Complete at 1.00m

Remarks:



Peat Core: 01
0 – 0.5 m



Peat Core: 01
0.5 – 1 m

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Project : Cairnoch Hill Wind Farm

Eurowind Energy Limited

Project No. : 428.V12085.00001

Date :- May 2026



Peat Core: 02
0 – 0.5 m



Peat Core: 03
0 – 0.5 m

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Project : Cairnoch Hill Wind Farm

Eurowind Energy Limited

Project No. : 428.V12085.00001

Date :- May 2026



Peat Core: 03
0.5 – 1 m

End of Photos

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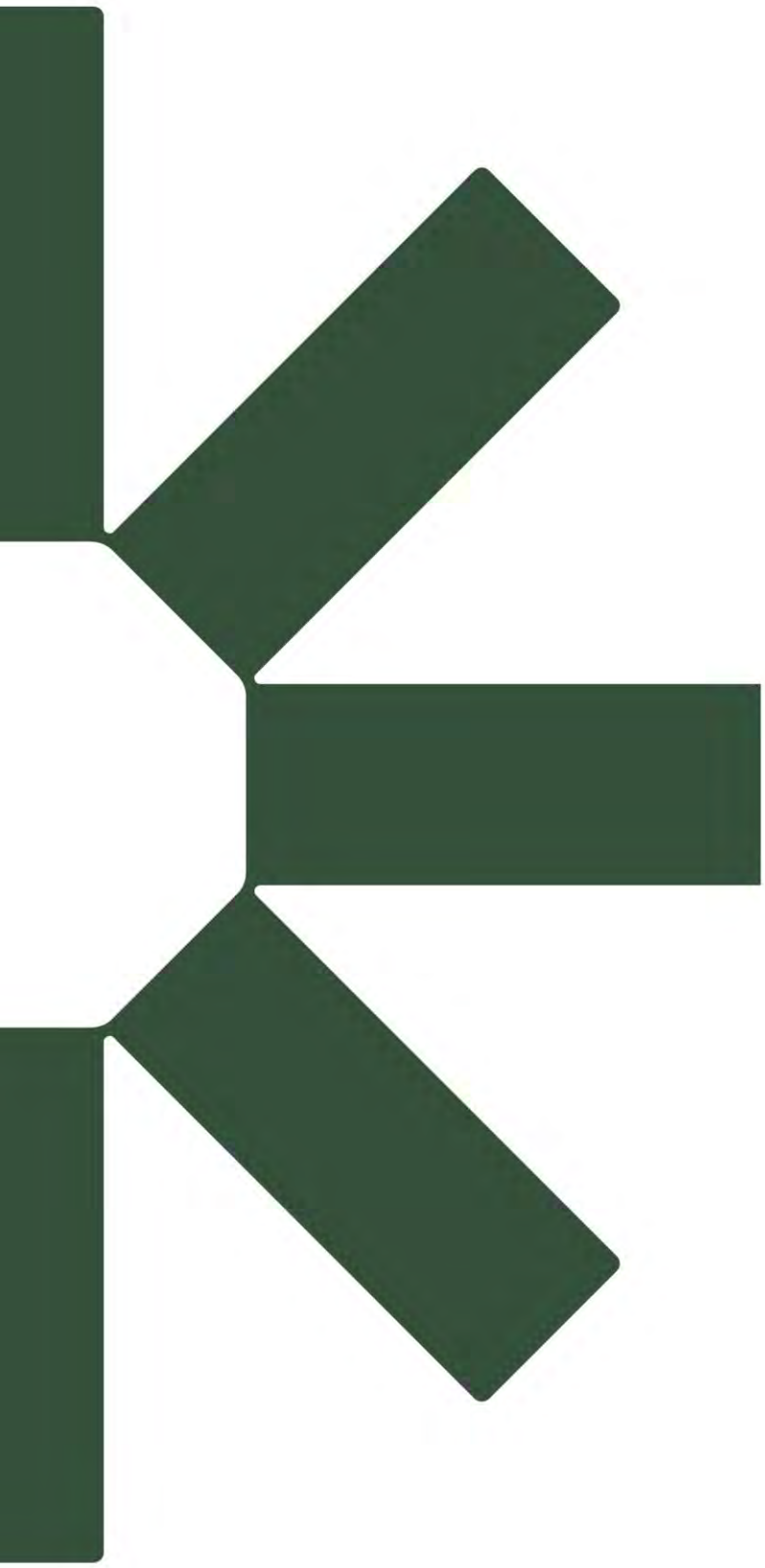
Tel: 0131 335 6830
Fax: 0131 335 6831
Web: www.slrconsulting.com

Project : Cairnoch Hill Wind Farm

Eurowind Energy Limited

Project No. : 428.V12085.00001

Date :- May 2026



Making Sustainability Happen

Technical Appendix 10.2: Outline Soil and Peat Management Plan

Cairnoch Hill Wind Farm

Eurowind Energy Limited

Prepared by:

SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 428.012085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	3 August 2026	R. Watson	D Nisbet	A. Huntridge

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Eurowind Energy Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Eurowind Energy Limited ("the Applicant") to prepare a Stage 1 Outline Soil and Peat Management Plan (SPMP) for Cairnoch Hill Wind Farm ("the Proposed Development").

The Proposed Development is for the construction and operation of up to four wind turbines (up to 180m to blade tip height) and associated infrastructure, on land managed by Forestry and Land Scotland (FLS) at Cairnoch Hill, within the administrative boundary of Stirling Council. The location and layout of the Proposed Development is shown on **Figure 3.1: Site Layout** of the Environmental Impact Assessment (EIA) Report, with the red line defining the Site boundary of the Proposed Development ("the Site"). Full details of the Proposed Development are provided in **Chapter 3: Description of the Development.**

This Stage 1 SPMP presents the findings of data obtained from peat depth probing surveys and assessments conducted by SLR Consulting. A desk study and comprehensive programme of soils and peat probing has been completed for the Proposed Development and described in Section 3.0 and Section 4.0.

This Stage 1 SPMP has been prepared in accordance with current best practice guidance[1,2,3]. The work has been undertaken by a team of Geotechnical Engineers and Geologists, with over 18 years' experience in undertaking peat assessments and specialising in the assessment of soils, geology and water for renewable power and infrastructure projects in Scotland.

1.2 Objectives

This Stage 1 SPMP outlines the overall approach of minimising disruption to peatland, with the objective that all further opportunities to minimise peat disturbance and extraction would be taken during detailed design and construction of the Proposed Development.

This Stage 1 SPMP has been developed to demonstrate that peat has been afforded significant consideration during the design of the Proposed Development. Specifically, it shows with the benefit of site-specific peat probing data, how areas of peat and deep peat have been avoided where technically feasible and how shallow deposits of carbon rich soils can be re-used and safeguarded to support the long-term restoration of the Site following construction.

1.3 Role of the Soil and Peat Management Plan

The SPMP is intended to be a working document to be used throughout the key stages of the design, construction, operation, decommissioning and re-instatement phases of the Proposed Development as part of an overall Construction Environmental Management Plan (CEMP). These stages are outlined below.

1 Scottish Environment Protection Agency (SEPA), (2017) Developments on Peat and Off-Site Uses of Waste Peat

2 Scottish Renewables, SEPA, (2012) Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and the Minimisation of Waste

3 Scottish Government, Scottish Natural Heritage, SEPA, (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only

Stage 1: Environmental Impact Assessment (EIA)

This report forms the Stage 1 Outline SPMP and is submitted as part of the EIA Report. From this initial report the SPMP will be developed further into a Stage 2 Pre-Construction SPMP should consent be granted.

Stage 2: Post Consent / Pre-Construction

The soil and peat mass balance calculations may be further developed post-consent, prior to the works commencing, following detailed ground investigation or further survey works required to inform detailed design, or that may be required under planning conditions.

Stage 3: Construction Stage

Actual soil and peat volumes excavated during construction will be recorded against the overall predicted volumes. Within micrositing allowances, the alignment and design of tracks, wind turbine foundations, hardstanding and associated construction methods will be reviewed to avoid/minimise soil and peat disturbance as much as possible considering the more detailed information available once construction commences. A regular review and update of the soil and peat mass balance table will be undertaken by the appointed Principal Contractor and monitored by the Ecological Clerk of Works (ECoW) onsite and made available to regulators as required.

1.4 Legislation

The SPMP has been compiled in accordance with the following legislation and best practice guidance:

- National Planning Framework for Scotland 4 (NPF4) (Scottish Government, February 2023)[4];
- Scottish Government, Scottish Natural Heritage, SEPA (2017) 'Peat Survey Guidance; Developments on Peatland: Site Surveys'[5];
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010)[6];
- Good Practice During Wind Farm Construction, NatureScot (July 2024)[7];
- Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and the Minimisation of Waste (Scottish Renewables and SEPA, 2012) [8];
- The Waste Management Licensing (Scotland) Regulations 2011[9];

4 Scottish Government (2023). https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2022/11/national-planning-framework-4-revised-draft/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4-revised-draft.pdf

5 Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only

6 Scottish Environment Protection Agency. 2010. Regulatory Position Statement – Developments on Peat

7 NatureScot (July 2024), Good Practice During Wind Farm Construction. https://www.nature.scot/doc/good-practice-during-wind-farm-construction

8 Scottish Renewables, Scottish Environment Protection Agency. 2012. Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and the Minimisation of Waste

9 Scottish Government 2011, The Waste Management Licensing (Scotland) Regulations 2011. https://www.legislation.gov.uk/sdsi/2011/9780111012147/contents

- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017) [10]; and
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010) [11].

Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4) [12] is "*to protect carbon rich soils, restore peatlands and minimise the disturbance of soils from development*".

The Policy states *[5(a)] that development proposals should only be supported if they are designed and constructed:*

- *in accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and*
- *in a manner that protects soils from damage including from compaction and erosion, and that minimises soils sealing.*

Further [5(c)] confirms *that development proposals on peatland, carbon rich soils, and priority peatland will only be supported if they are:*

- *essential infrastructure and there is a specific locational need and no other suitable site;*
- *the generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;*
- *small-scale development directly linked to a rural business, farm or croft;*
- *supporting a fragile community in a rural or island area; or*
- *restoration of peatland habitats.*

And [5(d)] confirms *that where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:*

- *the baseline depth, habitat condition quality and stability of carbon rich soils;*
- *the likely effects of the development on peatland, including on soil disturbance; and*
- *the likely net effects of the development on climate emissions and loss of carbon.*

Policy 5 also confirms that the site specific (above) assessment [5(d)] "*should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration*".

10 Peat Landslide Hazard and Risk Assessments (Scottish Government, April 2017)

11 Scottish Natural Heritage, Forestry Commission (August 2010). Floating Roads on Peat

12 Scottish Government (2023). https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2022/11/national-planning-framework-4-revised-draft/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4-revised-draft.pdf

Mitigation Hierarchy

SEPA[6] has published guidance regarding the mitigation hierarchy for developments on peat which is summarised below and has been used in development of the outline SPMP:

- Prevention – avoiding generating excess peat during construction (e.g. by avoiding peat areas or by using construction methods that do not require excavation such as floating tracks);
- Re-use – use of peat produced on-site in restoration, provided that its use is fully justified and suitable;
- Recycling / Recovery / Treatment – modify peat produced on-site for use as fuel, or as a compost / soil conditioner, or dewater peat to improve its mechanical properties in support to re-use; and
- Storage – applying the SEPA guidance, storage of peat up to a depth of 2 m is not classified as a waste, however clarification should be sought from the waste regulator prior to re-use and care must be taken to ensure that it does not cause environmental pollution.

2.0 Baseline Conditions

2.1 Definition of Peat

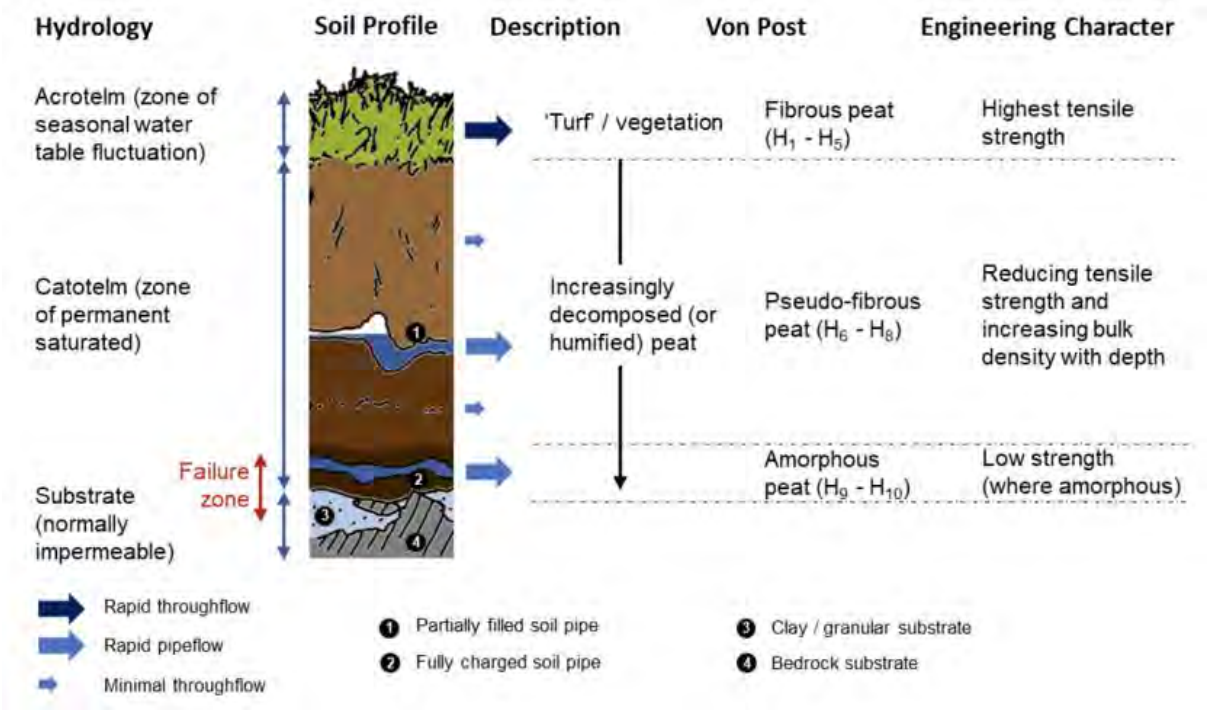
Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the degree of decomposition. Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material, and the peat 'grows' in-situ.

The Scottish Government Peat Landslide Hazard Best Practice Guide (2017) uses the following Joint Nature Conservation Committee (JNCC) report 445 'Towards an Assessment of the State of UK Peatlands' definition for classification of peat deposits:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5m deep;
- Peat: a soil with a surface organic layer greater than 0.5m deep which has an organic matter content of more than 60%; and
- Deep Peat: a peat soil with a surface organic layer greater than 1.0m deep.

Peat can be classed as two principal types, the acrotelm layer and the catotelm layer as shown on **Figure 2.1**.

Figure 2.1: Typical Peat Profile[13]



There are two principal types of peat in a near natural peatland:

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

- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1m to 0.6m deep. The acrotelm layer is found in the upper layer of peat where conditions are relatively dry and comprises living vegetation and partially decomposed plant material. Hydraulic conductivity in this layer tends to be higher in relation to distance from the water table. The thickness of the acrotelm layer varies depending on topography such as steepness of slope, peat hags, and hummocks. In particular, the acrotelm layer can be affected during periods of drought or as a consequence of drainage. Fibrous in texture, the acrotelm layer has some tensile strength and is generally considered to be stable for storage and re-use; and
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling. The catotelm layer is found under the acrotelm layer and comprises decayed plant material and organisms and is denser and with a very low hydraulic conductivity. The catotelm layer sits below the water table resulting in permanent anaerobic conditions. The catotelm layer is amorphous and has very low tensile strength making it less suitable for storage and re-use.

2.2 Site Description

The Proposed Development is located immediately north of Carron Valley reservoir and 6km east of Fintry, centred at National Grid Reference (NGR) NS 69768 85606. The Proposed Development is located in an area of commercial forestry with minor pockets of open moor and heathland.

Access to the Site is gained off the B818 via existing forestry tracks.

Average ground elevations across the Site are noted to be on average approximately 230m Above Ordnance Survey (AOD) near Carron Valley Reservoir at the southern boundary of the Site with the local highpoint of Cairnoch Hill in the centre of the Site at 413m AOD.

Information and historic maps from the National Library of Scotland[14] indicate that the Site has experienced limited changes over time. From the OS One Inch 1885-1900 map, the Site is shown to have been comprised of open undeveloped moorland. The historic map and aerial imagery review indicates that the majority of the Site was utilised for sheep farming.

Further details on land use and land management practices are provided within **Technical Appendix 10.5: Peatland Condition Assessment**.

2.3 Geology

Based on the information available from the British Geological Survey (BGS) Geoindex[15], no made ground deposits are mapped across the Site.

2.3.1 Superficial Geology

Based on the available BGS online data[15], the Site consists of variable superficial deposits including Devensian Till (generally mapped in the east, south and west, with isolated areas

14 National Library of Scotland, Map Finder Available from: https://maps.nls.uk/geo/explore/side-by-side/

15 BGS Online Viewer, available at [https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.133433804.376188765.1646739904-1030004651.1646739904]

in the centre and north), Hummocky (Moundy) Glacial Deposits (encroaching the Site boundaries to the north east, south and west), Peat (very small areas towards the north east and south) and Alluvium (very small areas encroaching the north east and south and south). Superficial geology BGS mapping is presented on **Figure 10.4: Superficial Deposits**.

2.3.2 Bedrock Geology

Based on the available BGS online data[15], the majority of the Proposed Development is underlain by basalt bedrock of the Campsie Lava Member (mapped in the south, west and north) and the Gargunnock Hills Lava Member (mapped in the centre and east). Additionally, basalts of the Spout of Ballochleam Lava Member (mapped along the northern boundary) and the Overton Lava Member (encroaching the north east boundary).

Igneous intrusive rocks are also noted within the Site comprising felsite and basaltic rocks of the Dinantian Dykes (present in an isolated area in the north) and Waterhead Central Volcanic-Complex (present in two isolated areas in the south).

Various linear features are present across the Proposed Development, all of which are denoted as being downthrow faults located along the northwest (trending south west to north east), centre (trending south west to north east), west (trending west to east) and south eastern corner (trending south west to north east).

Bedrock geology BGS mapping is presented on **Figure 10.8: Bedrock Geology**.

2.4 Peatland Classification

The Carbon and Peatland Map 2016[16] indicates that Class 4 and 5 peatland is mapped across much of the northern half of the Site, with an isolated area of Class 3 peatland in the centre near Cairnoch Hill. The proposed crane pad associated with Turbine 1 and Turbine 3 are located within areas of Class 4 peatland, with the proposed crane pad associated with Turbine 2 and Turbine 4 located within areas of Class 5 peatland. Class 5 peatland also encroaches into the south east corner of Turbine 1.

Much of the south, including the temporary construction compound and substation compound, is underlain by mineral soils (Class 0). Mineral soil also encroaches onto the west of Turbine 4. An isolated area of Class 4 peatland is present in the south east of the Site, adjacent to the Site boundary.

No Class 1 or 2 peatland, considered nationally important priority peatland, is indicated across the Proposed Development.

The Carbon and Peatland mapping is presented on **Figure 10.5**.

2.5 Hydrology

Scotland's Environment Map[17] identifies the majority of the Site to be underlain by the Carron and Touch waterbody (ID: 150598) with the north west underlain by the Campsie waterbody (ID: 150614), both of which have an overall classification of "good".

Much of the Site is located within the River Carron (Carron Valley Reservoir to Avon Burn) surface water catchment, a part of the larger River Carron (Falkirk) main river catchment. The south and west of the Site are located within the nested catchment of, and drain directly to, the Carron Valley Reservoir with the north east and east of the Site located within the Earls Burn nested catchment flowing generally south west along the north eastern boundary of the Site before discharging into the River Carron approximately 2.4km east. The north

16 NatureScot, Carbon and Peatland Map 2016, Available online at: map.environment.gov.scot/soil_maps/

17 Scotland's Environment Online Viewer. Available at: https://map.environment.gov.scot/sewebmap/

west extent of the Site is located within the Endrick Water (u/s Blane Water) surface water catchment, a part of the larger River Leven (Loch Lomond) main river catchment, flowing south west from the Proposed Development.

The Site is drained radially by multiple unnamed minor watercourses, with the highest concentration of these located in the south of the Site discharging directly into the Carron Valley Reservoir. Four minor watercourses in the north eastern extent of the Site drain into the Earl's Burn, while two drain the north western extent of the Site and discharge into the Endrick Water.

Further details are provided within **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

2.6 Hydrogeology

The BGS online data[15] identifies the Site to be underlain predominantly by volcanic member Dinantian extrusive rocks, which are characterised as a low productivity aquifer. Transmission and storage of water are almost entirely confined to the near surface weathered zones and secondary fractures with all current flow through fractures and discontinuities.

Further details are provided within **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

2.7 Geomorphology

The Site is characterised by the gentle sloping terrain that rises towards Cairnoch Hill, located at the centre of the Site at approximately 413m AOD. Flatter areas occur at break of slope and generally correspond to locations of deeper probe points (>0.5m).

The geomorphology of the Site has been significantly influenced by commercial forestry practises, with historic felling and replanting altering the natural landform. Associated drainage ditches and plough furrows have further modified the site. As a result, areas of microtopography are present, forming localised depressions that often coincide with deeper probe points.

Small bedrock outcrops were identified during site surveys but were not found to be extensive.

3.0 Fieldwork

3.1 Peat Surveys

Peat surveys were carried out in accordance with best practice guidance for developments on peatland[1,5]. Phase 1 (low resolution) peat probing was conducted on a 100m grid to identify the extent and depth of peat and inform preliminary Site layout. Phase 2 (detailed) peat probing was typically undertaken on tracks at 50m spacings with offset probing 10m either side. Infrastructure (wind turbines, hardstandings, compounds, etc) was typically probed at 10m spacings. Where upgraded infrastructure is proposed (access track) probing was undertaken adjacent to existing infrastructure.

The thickness of peat and soft sediment was assessed using a graduated fibre glass peat probe, approximately 12mm diameter and capable of probing depths of up to 10m. This was pushed vertically into the ground to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System (GPS) instrument.

The accuracy of the GPS was quoted as ±2m under open-sky conditions, with slightly reduced accuracy in areas of poor satellite visibility e.g. within dense forestry.

Where appropriate, conditions have also been assessed using visual interpretation e.g.:

- On steep slopes not conducive to peat formation;
- Areas of outcropping bedrock, or where conditions indicate a clear absence of peat e.g. glacial hummocks;
- Artificial or made ground deposits;
- Areas where probing is prohibited but conditions can be interpreted based on clear evidence at surface e.g. scheduled monuments;.
- Areas where cuttings expose the underlying substrate; and
- Assessment of surface vegetation / habitat.

Depths were recorded at 0.1m intervals. Where refusal was met at surface and shallow soil / vegetation was present, a depth of 0.1m was recorded, distinguishing it from areas of outcropping rock, where a depth of zero is recorded.

Where the peat probing met refusal on a hard substrate, the ‘feel’ of the refusal can provide an insight into the nature of the substrate. The following criteria were used to assess material:

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

The relative stiffness of the peat was also assessed from the resistance to penetration of the probe and to the effort required to extract the probes (retrieval of the probe was often impossible for one person). In all instances refusal was met on obstructions allowing identification of subsurface geology.

3.2 Peat Depth

Peat is generally defined as a soil with a surface organic layer in excess of 0.5m[1]. Where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral

soil). Soils with a peaty organic horizon over mineral soil are often referred to as ‘peaty soils’. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density.

A total of 3,229 peat probes were undertaken across all survey phases, with the results summarised in **Table A**. The maximum recorded depth of peat was 2.1 metres below ground level (mbgl), located in the north of the Proposed Development. The average thickness of peat across the Proposed Development was 0.3 m.

Table A: Peat Probing Results

Peat Thickness (m)	No. of Probes	Percentage (of total probes undertaken onsite)
0 (no peat)	152	4.7
0.01 – 0.49 (peaty soil)	2638	81.7
0.50 – 0.99	379	11.7
1.00 – 1.49	40	1.2
1.50 – 1.99	19	0.6
2.00 – 2.49	1	0
2.50 – 2.99	0	0
3.00 – 3.49	0	0
3.50 – 3.99	0	0
> 4.0	0	0

3.3 Substrate

Where possible, in the SLR investigation, an assessment of the substrate was made, as described previously. From the evidence of the probing and coring, the substrate was recorded as the following:

- Granular, recorded at 3,031 (94%) probe locations; and
- Rock, recorded at 198 (6%) probe locations.

Based on a review of the BGS mapping and site surveys, the granular material is anticipated to be of glacial till origin and of weathered bedrock. No rock samples were recovered from probe locations however, based on the limited rock exposures and BGS mapping, the bedrock is interpreted to be igneous in nature.

4.0 Management and Mitigation

The Proposed Development design took account of a number of environmental and technical constraints. The design sought to avoid areas of thick peat where technically feasible, whilst taking into account other environmental factors such as ecology, ornithology, archaeology, hydrology and topography. The Proposed Development design evolution has largely avoided extensive areas where peat is >1m.

There are areas of both permanent and temporary infrastructure within the Proposed Development which are on areas of deep peat >1m and it is acknowledged that the main mitigation will be further micrositing of wind turbines and infrastructure, adoption of sections of floating road where technically feasible and use of temporary hardstands to minimise excavation of peat during the construction phase.

Further details on mitigation through design included within the proposed development design evolution are provided in **Chapter 2: Design Evolution and Alternatives** of the EIA Report.

4.1 Potential Impacts

The initial construction phase for the proposed development will include soil and peat stripping and excavation activities. There are four main types of impact on peat which can occur during construction. These are:

- Loss of structural integrity and peat strength, due to stripping off or damaging the surface vegetation turf, excavation, handling and transporting peat (particularly wet, subsurface peat);
- Erosion and gullying, caused by exposure and desiccation of bare peat surfaces primarily caused by water erosion, due to surface runoff after rainfall;
- Contamination, caused by leaks, spillages or inappropriate laydown of materials; and
- Peat slide, caused by laying wet peat on top of wet peat, laying other heavy materials (including excavated mineral soil or other construction materials) on top of wet peat or by inappropriate stockpiling, such as attempting to create stockpiles of peat that are too high, without bunding, engineering or geotechnical support.

Where peat and peaty soils are to be excavated, re-used or reinstated, the following good practice applies to protect carbon rich soils and mitigate impacts to peat.

4.2 Excavation

Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) typically up to 0.5m thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat;

- The turves should be as large as possible to minimise desiccation during storage, though the practicalities of handling should be considered;
- The mixing of excavated peat with substrate materials to be avoided at all times; and
- Consider timing of excavation activities to avoid very wet weather and avoid multiple handling to minimise the likelihood of excavated peat losing structural integrity.

If possible, extract intact full depth acrotelm layers from the top surface of the peat deposit. This technique will maintain connectivity between the surface vegetation and the partially decomposed upper layers of the catotelm.

4.3 Re-use

It is anticipated that the volume of material excavated for the construction of the Proposed Development can be entirely reused for a variety of re-use, re-instatement and restoration purposes, including around constructed structures, restoration of temporary hardstanding areas and road verges. There is also potential for excavated peat to be used for habitat and peat restoration on or locally to the Proposed Development. This potential re-use option has not been quantified but will provide an additional method to retain and beneficially re-use material. Further details are provided in Section 6.0.

4.4 Temporary Peat Storage

The following good practice applies to the storage of peaty soils/peat:

- Stripped materials should be carefully separated to keep peat and other type of soils apart;
- To minimise handling and haulage distances, excavated material should be stored local to the site of excavation or end point of restoration;
- Peat turves would be stored in wet conditions or irrigated in order to prevent desiccation (once dried, peat will not rewet);
- Stockpiling of peat would be in large volumes to minimise exposure to wind and sun (and desiccation), but with due consideration for slope stability, but should not exceed 1m in height to maintain stability of stockpile;
- Stockpiles would be isolated from watercourses or drains with appropriate bunding to minimise pollution risks;
- To be stored a minimum of 10m from any watercourse.
- Stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat; and
- Peat storage areas would be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability.

Any peaty soils/peat to be removed during construction would require a temporary storage area near to the construction works/area of re-use. Where peat cannot be transferred immediately to an appropriate restoration area, short term storage will be required. In this case, the following good practice applies:

- Peat would be stored around the excavation perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- Local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for peat storage;
- Drying of stored peat should be avoided by irrigation or by seeding (although this is unlikely to be significant for peat materials stored for less than 2 months);
- Peat generated from permanent excavations should be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- Stores of catotelm peat should be bladed off to reduce their surface area and minimise desiccation;
- Where transport cannot be undertaken immediately, stored peat should be irrigated to limit drying and stored on a geotextile mat to promote stability; and

- Monitoring of large areas of peat storage during wet weather or snowmelt should be undertaken to identify any early signs of peat instability.

4.5 Transport

The following good practice applies to transport:

- Movement of turves should be kept to a minimum once excavated, and therefore it is preferable to transport soil planned for translocation and reinstatement to its destination at the time of excavation; and
- If heavy goods vehicles (HGVs)/dump trucks that are used for transporting non-organic soil material are also to be used for organic materials, measures should be taken to minimise cross-contamination of soils with other materials.

4.6 Handling

Following refinement of the material volumes, a detailed storage and handling plan should be prepared forming part of the detailed CEMP, including details of:

- Best estimate excavation volume at each infrastructure location which would be achieved by undertaking additional probing in line with current guidance;
- Volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere (e.g. storage areas) in order to minimise handling;
- Location and size of storage area relative to turbine foundations and infrastructure locations and geomorphology / drainage features; and
- Irrigation requirements and methods to minimise desiccation of excavated soils and peat during short term storage.

These parameters are best determined post-consent, informed by detailed ground investigation with the micro-siting areas for each element of infrastructure.

4.7 Restoration

There may be scope for re-use of peat within peatland restoration as detailed within **Technical Appendix 8.6: Outline Habitat Management Plan.** The methodologies detailed in any future restoration scheme should be followed as well as the following best practice:

- Carefully evaluate potential restoration sites, such as peat storage areas for their suitability, and agree that these sites are appropriate with the EnvCoW, landowners and relevant consultees;
- Undertake restoration and revegetation or reseeding work as soon as practically possible;
- Where required, consider exclusion of livestock from areas of the proposed development undergoing restoration, to minimise impacts on revegetation; and
- As far as reasonably practicable, restoration would be carried out concurrently with construction rather than at its conclusion.

4.8 Access Tracks

There is guidance[7,11] available to support access track design. Guidance is generally focused on floating tracks and excavated tracks and is summarised below.

Based on the avoidance of peat with tracks all present on peat <0.5m then the use of excavated tracks is proposed. Floating tracks are not considered to be necessary due to the absence of peat within the areas of infrastructure.

Excavated tracks require complete excavation of soil to a competent substrate. This soil would require storage ahead of re-use elsewhere within the Proposed Development. Good practice guidance relates mainly to drainage in association with excavated tracks:

- Trackside ditches should capture surface water before it reaches the road;
- Interceptor drains should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table);
- Any stripped turves should be placed back in the invert and sides of the ditch to assist regeneration and prevent wash out that could occur; and
- Culverts and cross drains should be installed under excavated tracks to maintain subsurface drainage pathways (such as natural soil pipes or flushes). Discharge from constructed drainage should allow for as much diffuse dispersion of clean (silt free) water as possible while minimising disturbance to existing peatland as far as possible. Silt mitigation measures will be incorporated into all constructed drainage as per the requirements of the CEMP.

Regular routine monitoring should be scheduled post-construction to ensure that hydrological pathways and track integrity have been suitably maintained.

4.9 Monitoring and Inspection

There would be frequent, routine and regular inspections of soil in all stockpiles and temporary storage areas as part of the SPMP audit process. Inspections would assess in situ physical conditions, integrity of containment and temporary drainage conditions, and would seek to confirm that stockpile design and management is adequate to prevent erosion and instability. These inspections would take place weekly during stockpile creation and storage.

Should any problems be observed during regular visual inspections of stockpiles, this would invoke implementation of an appropriate corrective action which would be recorded and monitored for effectiveness. Types of corrective actions would include, but would not necessarily be limited to; modification of temporary drainage, additional or modified bunding, incorporating of sediment fencing if required, light re-grading to correct any areas of surface erosion, etc.

5.0 Balance Assessment

Table B provides an estimate of soils and peat volumes to be excavated and re-used during the construction of the Proposed Development. The soils and peat excavation and re-use volumes are detailed for each infrastructure element in **Annex A**.

5.1 Excavated Volumes

Material excavation volumes associated with the construction of the Proposed Development have been calculated using the results from the surveys and interpolation using the GIS package ArcGIS. Excavation volumes are summarised in **Table B** and detailed in **Annex A** and are based on the following assumptions:

- Interpolation of probe depth was undertaken using the Spline interpolation method;
- An assumption that the probe depths are representative of the actual depth of soils and peat and validated by site observations; and
- The excavated volumes will comprise primarily organo-mineral soils.

5.2 Re-use Volumes

The volume of material to be re-used around the Proposed Development is detailed in **Table B** and **Annex A** and based on the following assumptions:

- Re-use would be undertaken in appropriate locations around the infrastructure perimeter such as track verges, the edges of permanent structures within a 3.0m wide strip either side of the track and up to a maximum thickness of 0.5m;
- Re-use would be undertaken in appropriate locations around the perimeter of turbines and hardstandings within a 2.0m wide strip and up to maximum thickness of 0.5m;
- Re-use would be undertaken in such a manner as to ensure integration with the adjacent habitat areas, where possible;
- For temporary infrastructure including temporary hardstandings and compounds – full re-instatement of excavated material would be undertaken at each location back to original depth; and
- For drain infilling, there is a total of 8,800m of drains, 0.5m wide, 0.5m deep, full re-instatement using acrotelmic peat would be undertaken across the drainage network.

5.3 Net Peat Balance

Table B provides an estimate of material volumes to be excavated and re-used during the construction of the infrastructure. The soils are predominantly organic soils.

Table B: Balance Assessment

Infrastructure	Volume of Excavated Material (m^3)	Volume of Re-use Potential (m^3)
Access Track - Cut	2782	3,477
Access Track - Upgraded	4443	11,108
Turbines & Crane Pads Permanent	7470	480
Crane Pads Temporary	3243	3243
Blade Laydown Area	51	51
Substation	1160	175
Temporary Construction Compound	4560	4,560
Drain Infilling	0	2,200
Total	**23,709**	**25,294**

The total volume of material predicted to be excavated of 23,709m^3, does not exceed the estimated total re-use volume potential of 25,294m^3, therefore it is expected that there will be no excess material required to be disposed offsite as a consequence of the Proposed Development.

6.0 Waste Classification

This section of the Stage 1 Outline SPMP includes the method for dealing with soils which could potentially be classified as waste if these cannot be re-used onsite

Table C outlines where those materials that are likely to be generated onsite, fall within the Waste Management Licensing (Scotland) Regulations 2011[18].

Based on the results presented in this document, it has been concluded that all of the materials to be excavated onsite would fall within the non-waste classification and would be re-used onsite.

18 Scottish Government 2011, The Waste Management Licensing (Scotland) Regulations 2011.

https://www.legislation.gov.uk/sdsi/2011/9780111012147/contents

Table C: Excavated Materials – Assessment of Suitability

Excavated Material	Indicative Volume % of total excavated material	Is there a suitable use for material	Is the Material required for use on Site	Material Classified as Waste	Re-use Potential	Re-use on Site
Turves and organo-mineral soils	95	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of wind turbine bases, and hardstandings.
Acrotelm and upper catotelmic peat	5	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of wind turbine bases, and hardstandings.
Amorphous catotelm peat	0	No	No	Not classified as waste	No	If peat does not require treatment prior to re-use it can be used on-site providing adequate justification and method statements are provided and approved by SEPA. If it is unsuitable for use without treatment then it may be regarded as a waste however every attempt to avoid this type of peat has been incorporated into the design.

7.0 Conclusion

This Stage 1 Outline SPMP presents a pre-construction assessment of the expected material excavation and re-use volumes associated with the works phase of the construction of the Proposed Development.

Peat is generally defined as a soil with a surface organic layer in excess of 0.5m. Where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral soil).

Negligible peat deposits were encountered across the Site with only localised areas of peat recorded, which have been largely avoided during the design iteration process. The vast majority of soils encountered across the Site are largely deemed to be organic-mineral soils rather than peat.

A total of 3,229 peat probes were undertaken across all survey phases. The maximum recorded depth of peat was 2.1mbgl, located in the north of the Site. The average thickness of peat across the Site was 0.3m.

Through a process of continued design refinement (focused on minimising peat excavation volumes) and adoption of best practice working methods, the Proposed Development is expected to achieve an overall material balance, i.e. the volume (and character) of excavated material compliments requirements for re-use and reinstatement.

The total volume of material predicted to be excavated of 23,709m^3, does not exceed the estimated total re-use volume potential of 27,798m^3, therefore it is expected that there will be no excess material required to be disposed offsite as a consequence of the Proposed Development.

Figures

Technical Appendix 10.2: Outline Soil and Peat Management Plan

Cairnoch Hill Wind Farm

SLR Project No.: 428.012085.00001

268000 268500 269000 269500 270000 270500 271000 271500

687000 686500 686000 685500 685000

Figure 10.2.1b
Figure 10.2.1c
Figure 10.2.1d
Figure 10.2.1e

T1 T2 T3 T4

N

LEGEND

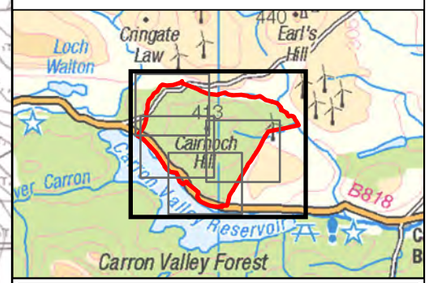
- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Blade Laydown Area

Probe Depth Location

- 0
- >0, ≤0.5
- >0.5, ≤1
- >1, ≤1.5
- >1.5, ≤2
- >2, ≤3

Probe Depth (m)

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3



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CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT MANAGEMENT PLAN

DETAILED PROBE DEPTH

FIGURE 10.2.1a

Scale 1:12,000 @ A3

Date JUNE 2026

0 0.25 0.5 1

Kilometres

428.V12085.00001.0155.0 Detailed Probe Depth

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268500 269000 269500

687000

686500

N

T1

T2

0 125 250 500

Metres

LEGEND

Site Boundary

Proposed Turbine Location

Proposed New Track

Proposed Existing Track to be Upgraded

Proposed Crane Pad / Hardstanding

Probe Depth Location

0

>0, ≤0.5

>0.5, ≤1

>1, ≤1.5

>1.5, ≤2

>2, ≤3

Probe Depth (m)

0

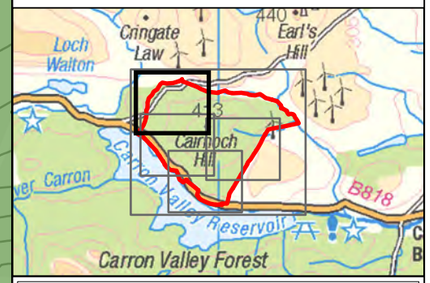
0 - 0.5

0.5 - 1

1 - 1.5

1.5 - 2

2 - 3



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CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT MANAGEMENT PLAN

DETAILED PROBE DEPTH

FIGURE 10.2.1b

Scale 1:5,000 @ A3

Date JUNE 2026

428.V12085.00001.0155.0 Detailed Probe Depth

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268500 269000 269500

686000

685500

T2

N

Cairn

B815

0 125 250 500

Metres

LEGEND

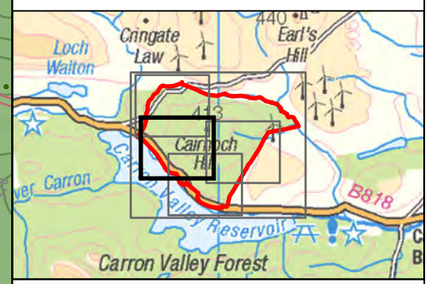
- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding

Probe Depth Location

- 0
- >0, ≤0.5
- >0.5, ≤1

Probe Depth (m)

- 0
- 0 - 0.5
- 0.5 - 1



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EIAR - TA10 - PEAT MANAGEMENT PLAN

DETAILED PROBE DEPTH

FIGURE 10.2.1c

Scale 1:5,000 @ A3

Date JUNE 2026

428.V12085.00001.0155.0 Detailed Probe Depth

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269000 269500 270000 270500

685000

684500

LEGEND

- Site Boundary
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Blade Laydown Area

Probe Depth Location

- 0
- >0, ≤0.5
- >0.5, ≤1
- >1, ≤1.5
- >1.5, ≤2

Probe Depth (m)

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2

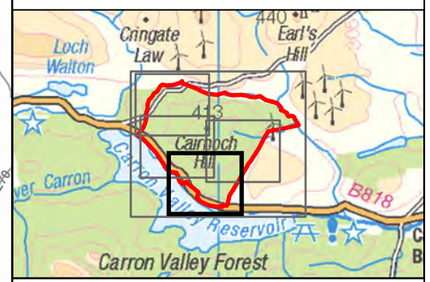
N

B818

Kirk o' Muir

0 125 250 500

Metres



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CAIRNOCH HILL WIND FARM

EIAR - TA10 - PEAT MANAGEMENT PLAN

DETAILED PROBE DEPTH

FIGURE 10.2.1d

Scale 1:5,000 @ A3

Date JUNE 2026

428.V12085.00001.0155.0 Detailed Probe Depth

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270000
270500
271000
685500
Cairnoch Hill
T3
T4
N
LEGEND
Site Boundary
Proposed Turbine Location
Proposed New Track
Proposed Existing Track to be Upgraded
Proposed Crane Pad / Hardstanding
Proposed Substation Compound
Proposed Temporary Construction Compound
Probe Depth Location
0
>0, ≤0.5
>0.5, ≤1
>1, ≤1.5
>1.5, ≤2
Probe Depth (m)
0
0 - 0.5
0.5 - 1
1 - 1.5
1.5 - 2
2 - 3
Cringate Law
Earl's Hill
Loch Walton
Carron
Carron Valley Reservoir
Carron Valley Forest
B818
0
125
250
500
Metres
Eurowind Energy
SLR
CAIRNOCH HILL WIND FARM
EIAR - TA10 - PEAT MANAGEMENT PLAN
DETAILED PROBE DEPTH
FIGURE 10.2.1e
Scale 1:5,000 @ A3
Date JUNE 2026
428.V12085.00001.0155.0 Detailed Probe Depth
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Annex A Excavated Materials Calculations

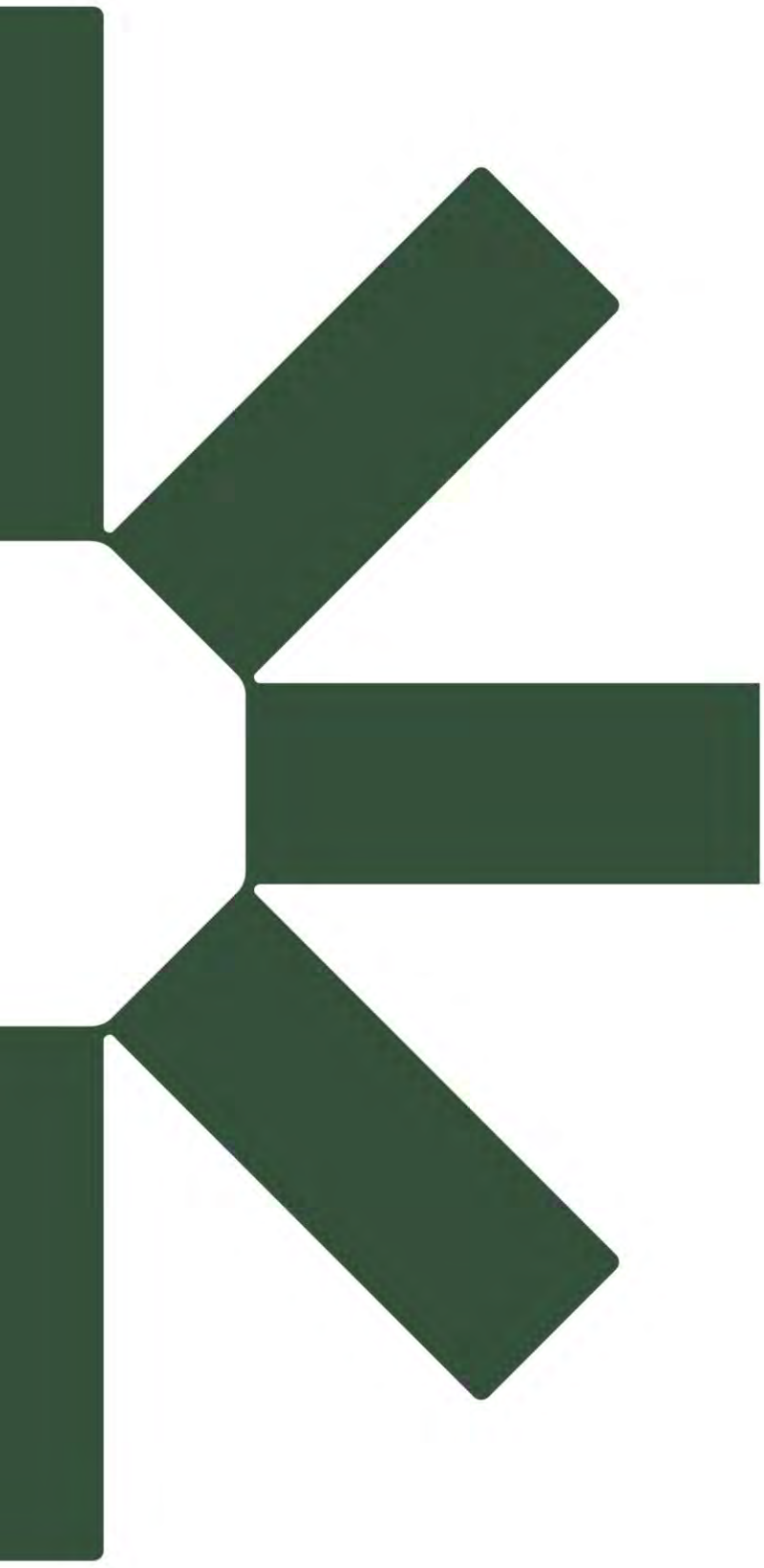
Technical Appendix 10.2: Outline Soil and Peat Management Plan

Cairnoch Hill Wind Farm

SLR Project No.: 428.012085.00001

Infrastructure on Peat	Length (m)	Width (m)	Area (m^2)	Average Depth of Peat (m)	Number	Total Excavated Volume Acrotelm Peat (m^3)	Total Excavated Volume Catotelm Peat (m^3)	Total Excavated Volume Peat (m^3)	Length (m)	Width (m)	Area (m^2)	Average Thickness of Peat (m)	Number	Total Re-use Volume Acrotelm Peat (m^3)	Total Re-use Volume Catotelm Peat (m^3)	Total Re-use Volume of Peat (m^3)	Notes
Access Track - Cut	2318	6	13908	0.20	1	2782		2782	2318	1.5	3477	0.50	2	3477		3477	1.5m placed either side of access track.
Access Track - Upgraded	7405	3	22215	0.20	1	4443		4443	7405	1.5	11108	0.50	2	11108		11108	1.5m placed either side of access track.
Turbine & Crane Pad Permanent T01	-	-	3700	0.50	1	1850		1850	240	1	240	0.50	1	120		120	Placed around the perimeter.
Turbine & Crane Pad Permanent T02	-	-	3700	0.19	1	685		685	240	1	240	0.50	1	120		120	Placed around the perimeter.
Turbine & Crane Pad Permanent T03	-	-	3700	0.30	1	1110		1110	240	1	240	0.50	1	120		120	Placed around the perimeter.
Turbine & Crane Pad Permanent T04	-	-	3700	1.03	1	1850	1975	3825	240	1	240	0.50	1	120		120	Placed around the perimeter.
Crane Pad Temporary T01	-	-	1900	0.45	1	846		846	-	-	1900	0.45	1	846		846	Fully reinstated
Crane Pad Temporary T02	-	-	1900	0.40	1	768		768	-	-	1900	0.40	1	768		768	Fully reinstated
Crane Pad Temporary T03	-	-	1900	0.30	1	568		568	-	-	1900	0.30	1	568		568	Fully reinstated
Crane Pad Temporary T04	-	-	1900	0.56	1	950	112	1062	-	-	1900	0.56	1	950	112	1062	Fully reinstated
Blade Laydown Area	128	5	640	0.08	1	51		51	-	-	640	0.08	1	51		51	Fully reinstated
Substation	-	-	4000	0.29	1	1160		1160	350	1	350	0.50	1	175		175	Placed around the perimeter.
Temporary Construction Compound	-	-	12000	0.38	1	4560		4560	-	-	12000	0.38	1	4560		4560	Fully reinstated
Drain Infilling	-	-	67274	0.00	1	0		0	8800	0.5		0.50	0	0	2200	2200	8.8km of Drain infilling (cross sectional area 0.5m x 0.5m)
Totals						**21622**	**2086**	**23709**						**22982**	**2312**	**25294**	

Total Excavated Volume Acrotelm Peat (m^3)	**21622**
Total Excavated Volume Catotelm Peat (m^3)	**2086**
Total Excavated Volume Peat (m^3)	**23709**
Total Re-use Volume Acrotelm Peat (m^3)	**22982**
Total Re-use Volume Catotelm Peat (m^3)	**2312**
Total Re-use Volume of Peat (m^3)	**25294**
Net Balance (m^3)	**-1585**



Making Sustainability Happen

Technical Appendix 10.3: Schedule of Watercourse Crossings

Cairnoch Hill Wind Farm

Eurowind Energy Limited

Prepared by:

SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	3 August 2026	J. Lynagh-Dunbar	K. Rainford	K. Wyness

Basis of Report

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Acronyms and Abbreviations

CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011
CEMP	Construction Environmental Management Plan
EASR	Environmental Authorisations (Scotland) Regulations 2018
EIA	Environmental Impact Assessment
GBR	General Binding Rules
OEMP	Operational Environmental Management Plan
SEPA	Scottish Environment Protection Agency
SC	Stirling Council
WEWS	Water Environment and Water Services (Scotland) Act 2003
WFD	Water Framework Directive (2000/60/EC)

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2.0 Watercourse Crossing Details 3
3.0 Summary and Recommendations 9

1.0 Introduction

This Technical Appendix presents a schedule of watercourse crossings which will be required to facilitate construction and operation of Cairnoch Hill Wind Farm ("the Proposed Development").

This report presents photographs and dimensions for each proposed watercourse crossing point. The report also details the likely form of the track crossing solution (e.g., culvert, arch culvert, or bridge), where new crossings are proposed. The final design of each crossing solution would be agreed with the Scottish Environment Protection Agency (SEPA) prior to construction as part of the detailed site design.

Surveys of the proposed watercourse crossings were undertaken in September 2025 and May 2026 by experienced SLR hydrologists.

The location of the watercourse crossings is shown in **Figure 10.2** of the Environmental Impact Assessment (EIA) Report. Details of the hydrological setting of the Proposed Development are outlined in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report.

1.1 Relevant Legislation

The Water Framework Directive (2000/60/EC) (WFD) has been transposed into Scottish legislation as the Water Environment and Water Services (Scotland) Act 2003 (or WEWS) and has given Scottish ministers powers to introduce regulatory controls over activities in order to protect and improve Scotland's water environment. The water environment includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater.

These regulatory controls, known as the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) came into force in 2011 and have since been amended in 2013, 2017, and 2021. In November 2025, the Environmental Authorisations (Scotland) Regulations (EASR)[1] were extended to include water activities and supersede the CAR.

With respect to watercourse crossings, the EASR outline that engineering activities (except culverting for land-gain, dredging and permanent diversions or realignments) on minor watercourses do not require an authorisation[2]. A minor watercourse is one that is not shown on the 1:50,000 scale Ordnance Survey maps (Landranger series).

The EASR authorisation process for watercourse crossings[3] operates under several authorisations levels:

- General Binding Rules (GBR6):
  - Installation of an outfall or a crossing on a watercourse or loch where:
    - A crossing where no part of the crossing is on the bed or banks of a river, burn, ditch or loch.
- General Binding Rules (GBR7):
  - Installation of temporary crossings, structures or works where:

[1] Scottish Government (2018) Environmental Authorisations (Scotland) Regulations (EASR)

[2] Details on activities that do not require an authorisation, available online at Activities that do not require an authorisation | Beta | SEPA | Scottish Environment Protection Agency

[3] Details on activities that involve the installation of a crossing to a watercourse and the authorisation required, available online at Crossings | Beta | SEPA | Scottish Environment Protection Agency

    - Temporary crossings and temporary structures are in a river, burn, ditch or loch; or
    - Any temporary works are associated with the undertaking of any other activity specified in this GBR or for the purpose of maintaining an existing man-made structure in a river, burn, ditch or loch.
- Registration (EASR-SC-054):
    - Installation of a crossing across a watercourse or loch where:
        - No part of the crossing is on the bed; and
        - Part of the crossing is on the bank, and the total cumulative length of all banks is less than or equal to 50m.
- Registration (EASR-SC-055):
    - Installation of a crossing (excluding crossings with piers, causeways and fords) across a watercourse that has a bed width of 2m or less, or a loch where:
        - Part of the crossing is on the bed;
        - The total cumulative length of channel affected is less than or equal to 15m; and
        - The total cumulative length of all banks affected is less than or equal to 50m.
- Permit:
    - Installation of all other crossings across a watercourse or loch (this includes all fords, causeways and bridges with piers). This includes:
        - Installation of a new permit level crossing (those that do not meet the registration or GBR activity thresholds);
        - Alteration of an existing permit level crossing which does not meet the maintenance criteria;
        - Removal of an existing permit level crossing; and
        - Installation or removal of a crossing which cannot comply with GBR or registration standard conditions.

2.0 Watercourse Crossing Details

The Proposed Development has sought to utilise existing tracks and access routes where possible. No new watercourse crossings are required to establish the Proposed Development however, upgrades to six existing watercourse crossings may be required subject to detailed structural assessment which will be completed prior to construction. Details of the existing crossings as shown on the 1:10,000 scale mapping are included below.

Watercourse Crossing ID	WCX1
Watercourse Crossing Details	**Grid Reference:** E 270280 / N 684521 **Status:** Existing **Crossing Type:** Concrete circular culvert **Crossing Size:** 400mm diameter **Watercourse Width:** 0.4m **Watercourse Depth:** 0.2m **Notes:** Culvert occluded by vegetation at entrance. Pooling around 2m wide and 0.6m deep at outflow of culvert.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

Watercourse Crossing ID	WCX2
Watercourse Crossing Details	**Grid Reference:** E 270581 / N 685150 **Status:** Existing **Crossing Type:** Concrete circular culvert **Crossing Size:** 600mm **Watercourse Width:** 0.6m **Watercourse Depth:** 0.2m **Notes:** Culvert eroded around entrance.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

Watercourse Crossing ID	WCX03
Watercourse Crossing Details	**Grid Reference:** E 269155 / N 684983 **Status:** Existing **Crossing Type:** Closed pipe corrugated metal culvert **Crossing Size:** 900mm **Watercourse Width:** 0.3m **Watercourse Depth:** 1.0m **Notes:** Culvert appears to be eroding through the metal and has washed out material below.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

Watercourse Crossing ID	WCX04
Watercourse Crossing Details	**Grid Reference:** E 268499 / N 685700 **Status:** Existing **Crossing Type:** Concrete circular culvert **Crossing Size:** 400mm **Watercourse Width:** 0.2m **Watercourse Depth:** 0.1m **Notes:** Culvert heavily occluded by vegetation.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

Watercourse Crossing ID	WCX05
Watercourse Crossing Details	**Grid Reference:** E 268546 / N 686179 **Status:** Existing **Crossing Type:** Concrete circular culvert **Crossing Size:** 400mm **Watercourse Width:** 0.5m **Watercourse Depth:** 0.2m **Notes:** Outfall of culvert has a large, eroded pool approximately 1.5m wide and 0.5m deep.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

Watercourse Crossing ID	WCX6
Watercourse Crossing Details	**Grid Reference:** E 269757 / N 684320 **Status:** Existing **Crossing Type:** Plastic circular culvert **Crossing Size:** 400mm **Watercourse Width:** N/A **Watercourse Depth:** N/A **Notes:** Entrance occluded by vegetation. No flowing water was recorded during time of survey. Wider channel noted to be approximately 1m wide and 1m deep.
Photograph Looking at Crossing Entrance from Upstream	
Photograph Looking at Crossing Exit from Downstream	

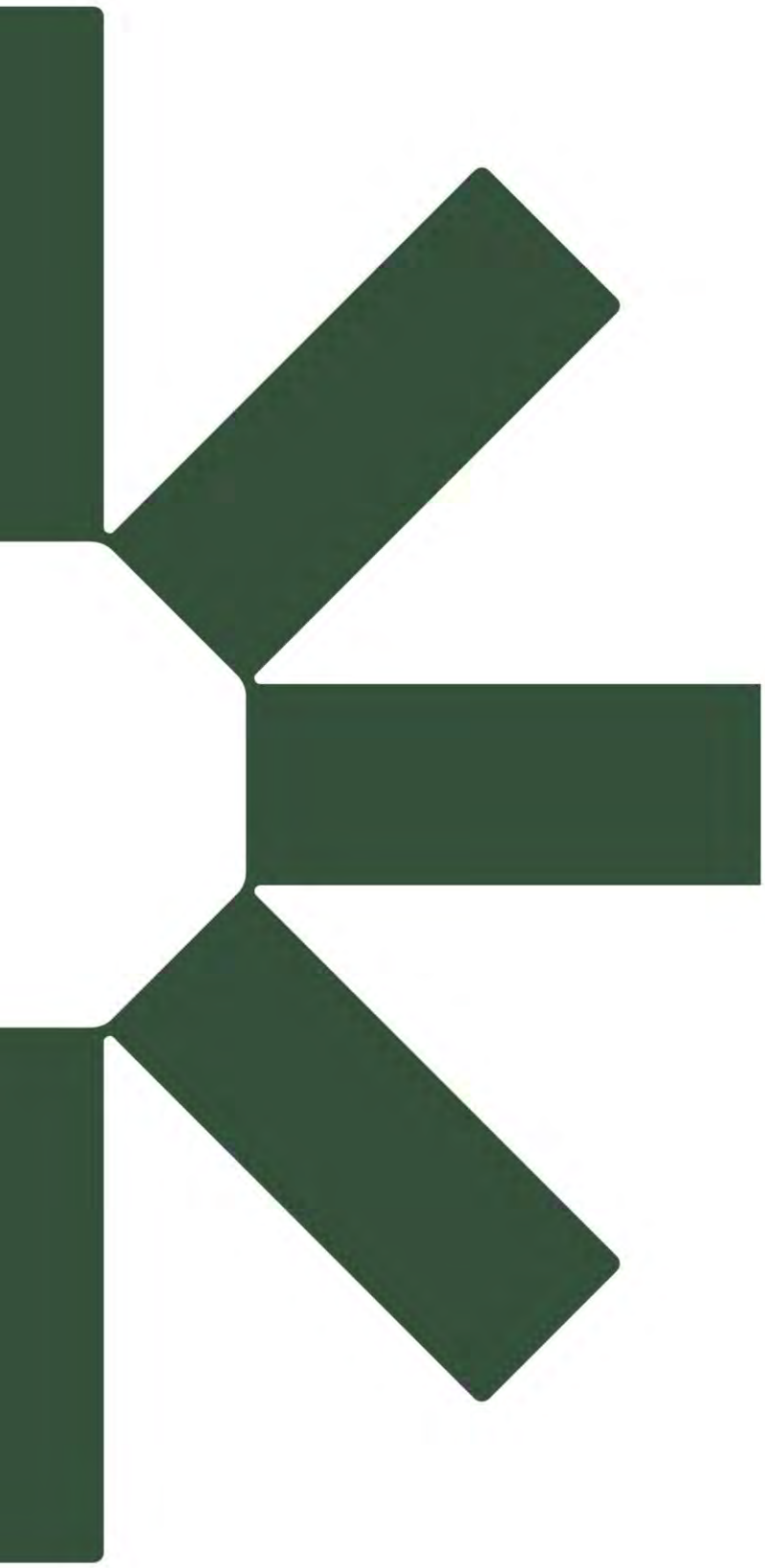
3.0 Summary and Recommendations

Upgrades to six existing crossings may be required to facilitate the construction and operation of the Proposed Development, subject to detailed structural assessment which will be completed prior to construction. The location of these existing crossings are shown on **Figure 10.2** of the EIA Report.

As stated in the **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report, any upgrades to the crossings will be designed to pass the 200-year flood event plus an allowance for climate change and their design and construction details would be agreed with SEPA and Stirling Council as part of the final Construction Environmental Management Plan (CEMP), prior to construction.

An Operational Environmental Management Plan (OEMP) will also be prepared to maintain the relevant mitigation and management measures established during the construction phase into the operational phase of the Proposed Development. This will include routine inspection and clearing of the watercourse crossings throughout the operational phase of the Proposed Development.

Additional good practice methods which will be adopted during construction and operation of the Proposed Development with respect water environment are outlined in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the EIA Report.



Making Sustainability Happen

Technical Appendix 10.4: Private Water Supply Risk Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

Prepared by:

SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	3 August 2026	J. Lynagh-Dunbar	K. Rainford	K. Wyness

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Acronyms and Abbreviations

CSM	Conceptual Site Model
EIA	Environmental Impact Assessment
OS	Ordnance Survey
PWS	Private Water Supplies
SEPA	Scottish Environment Protection Agency
SC	Stirling Council

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Table 2: Private Water Supply Risk Assessment Criteria 3

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Figures 10.4.1: Private Water Supply Locations

1.0 Introduction

This report has been prepared to assess the potential effect of the proposed Cairnoch Hill Wind Farm (the Proposed Development) on the quality and quantity of water at private water supply (PWS) sources within the Study Area, which comprises a buffer of 500m from the location of the Proposed Development ("the Site"), specifically the Site boundary.

To complete the assessment a conceptual site model (CSM) is presented which uses a source-pathway-receptor linkage to assess the risk to each PWS. Where necessary mitigation, required to safeguard a water source, is proposed.

The location of the PWS sources is shown on **Figure 10.4.1**.

This Technical Appendix should be read in conjunction with **Chapter 10: Hydrology, Hydrogeology, Geology and Soils** of the Environmental Impact Assessment (EIA) Report which contains a detailed description of the local hydrology and hydrogeology, flow mechanisms and hydraulic properties of the soils and geology, the embedded mitigation incorporated in the Proposed Development design, and an assessment of impacts on groundwater and surface water flows and quality.

1.1 Survey Approach

Following consultation with Stirling Council, data was received for PWS sources within the Study Area. This data was then augmented with Ordnance Survey (OS) mapping and aerial photography.

Additional properties, and potential water users, were also identified following a programme of site-specific field investigation that involved visiting the properties within the Study Area, enquiring about their water use and source, and mapping water abstraction locations. A standard reporting questionnaire was used to ensure consistency of data collected.

The location of water sources (boreholes, springs, surface abstractions) and holding tanks etc. were recorded using a handheld GPS. When residents were unavailable on the day that the survey was conducted, questionnaires were left at properties requesting details of their water source or PWS.

1.2 Assessment Methodology and Report Structure

As required by Scottish Environment Protection Agency (SEPA) the assessment has been undertaken by suitably qualified and experienced specialists. The field investigation was completed in September 2025 by the author of this report, and the assessment has been reviewed by Kelly Wyness MA.

The assessment has been undertaken with reference to SEPA's guidance[1] which sets outs SEPA's expectations for the assessment of impact of developments on groundwater abstractions, both public and private water supplies. This guidance applies to proposed infrastructure, both temporary or permanent and given dewatering abstractions are unlikely to exceed $10m^3$/day.

SEPA recommends adopting a phased approach to the assessment of risks to groundwater abstractions, with greater detail being required for higher risk sites or activities, and identify the steps given in **Table 1-1**.

[1] SEPA (August 2024) Guidance on Assessing the Impacts of Development on Groundwater Abstractions

Table 1-1: SEPA Methodology - Assessment Steps

Step	Description
1	Identifying any Existing Groundwater Abstractions This covers both public and private water supply groundwater abstractions, both within and out with the site boundary. It is critical that it is the actual source of the abstraction, and not the property that it supplies, that is identified. The relevant buffer zones for groundwater abstractions for all proposed infrastructure, both temporary and permanent and provided expected dewatering rates do not exceed 10m3/day, are: a) 10m for all activities; b) 100m radius of all subsurface activities less than 1m in depth; and c) 250m of all subsurface activities deeper than 1m Details of each private water supply source will require confirmation, including a site walkover survey. If there are no groundwater abstractions within the buffer zones, SEPA will not provide comment on this topic in our planning response. **If there are no groundwater abstractions within the buffer zones there is no need to assess further and progress to Step 2.**
2	Qualitative Impact Assessment A conceptual site model (CSM) should be provided as part of the Environmental Statement. This should include interpretation of the hydrogeological setting, including the groundwater flow regime. This may be supported, as appropriate, by intrusive ground investigation, groundwater monitoring, or groundwater modelling. Qualitative assessment of the potential impacts to any groundwater abstractions identified within the relevant buffer zones is required. This should consider the expected extent, magnitude, likelihood, and duration, frequency, and reversibility of any potential impacts. The impact assessment should consider the impacts to each groundwater abstraction individually, including any potential cumulative effects if the groundwater abstraction is near multiple parts of the proposed development. **If the potential impacts to groundwater abstractions are considered low or less then no further risk assessment (e.g. Step 3) is required.**
3	Detailed Quantitative Risk Assessment This would include characterisation of the ground conditions at both the relevant infrastructure location(s) and the groundwater abstraction(s), plus the pathway(s) in between if appropriate. This will require ground investigation, including groundwater level and quality monitoring and quantify the potential change(s) in groundwater levels or flow regime.

Using this approach and developing this to include surface water abstractions and to consider the distribution pipework from ground and surface water abstractions the criteria given in **Table 1-2** have been used to assess potential risk to each PWS source.

Table 1-2: Private Water Supply Risk Assessment Criteria

PWS Risk	Criteria
PWS source considered potentially at risk from the Proposed Development	• PWS source is located within 10m of any element of the Proposed Development; • Spring fed or groundwater source is located within 100m of excavations less than 1m deep (such as access tracks); • Spring fed or groundwater source is located within 250m of excavations greater than 1m deep (such as borrow pits, turbine crane pads and other hardstanding areas); and / or • Stream or surface water fed abstraction is located within the same surface water catchment and downstream of the Proposed Development.
PWS source is not considered at risk or PWS source is unconfirmed. Distribution pipework may be impacted	• PWS source is located at least 10m away from any element of the Proposed Development; • Spring fed or groundwater source is not located within 100m of excavations less than 1m deep (such as access tracks); • Spring fed or groundwater source is not located within 250m of excavations greater than 1m deep (such as borrow pits, turbine crane pads and other hardstanding areas); • Stream abstraction is not located within the same surface water catchment and / or upstream of the Proposed Development; • PWS source is unconfirmed and needs to be assessed prior to construction; and • The distribution pipework between the PWS source and property may be crossed by the Proposed Development.
PWS source or pipework is not considered to be at risk from the Proposed Development	• PWS source is located at least 10m away from any element of the Proposed Development; • Spring fed or groundwater source is not located within 100m of excavations less than 1m deep (such as access tracks); • Spring fed or groundwater source is not located within 250m of excavations greater than 1m deep (such as borrow pits, turbine crane pads and other hardstanding areas); • Stream abstraction is not located within the same surface water catchment and / or upstream of the Proposed Development; and • The distribution pipework between the PWS source and property will not be crossed by the Proposed Development.
Property supplied by mains	Property has been confirmed to be supplied by mains rather than a private water supply and therefore no further assessment is required.

The results of the PWS survey and assessment are presented in Section 2 of this report in accordance with Step 1 of the SEPA guidance.

2.0 Private Water Supply Risk Assessment (Step 1)

Table 2-1 presents information collected from the PWS field survey, returned questionnaires, data collected during the desk study and following consultation with Stirling Council. If a source is assessed to be within the buffers specified in SEPA's guidance and have a hydraulic connection (e.g. there is a flow pathway) to the Proposed Development, a further qualitative risk assessment is required.

The findings from **Table 2-1** are summarised as follows:

- One PWS source is not considered to be at risk from the Proposed Development; and
- Two PWS sources are unconfirmed and details will need to be confirmed prior to construction commencing. This will be completed post consent, should the Proposed Development be consented, and secured as part of a planning condition prior to the commencement of works.

Table 2-1: Private Water Supply Risk Assessment

PWS ID (Drawing 10.4.1)	Property Name	Data Source and Source Type	Location of PWS Source and Distance from the Proposed Development	Details	PWS Risk Assessment (see Table 1-2)
PWS01	Cairnoch Farm Cairnoch Bothy	Survey Borehole	E 269237 / N 684493 Approximately 130 m south-west of the existing access track which is scheduled to be upgraded.	The properties have been confirmed to be supplied by borehole which is located approximately 30m to 50m south west of the properties. The borehole is 50m deep, and water is pumped from the borehole to a holding tank and pressuring vessel building, which is located near the properties, before it is fed to the properties for use. No development is proposed within 100m of the PWS source. No development, except for potential upgrades to an existing access track is proposed within 250m of the borehole. No excavations >1m deep would be required to facilitate upgrades to the existing access track. The Proposed Development would not cross any distribution pipework from the borehole to the properties.	PWS source and pipework not considered to be at risk. No further assessment, monitoring or mitigation required.

PWS ID (Drawing 10.4.1)	Property Name	Data Source and Source Type	Location of PWS Source and Distance from the Proposed Development	Details	PWS Risk Assessment (see Table 1-2)
				Therefore, PWS source and distribution pipework is not considered to be at risk from the Proposed Development.	
PWS02	Cairnoch Lodge	Council Data PWS Unconfirmed	E 270410 / N 686810 (property location only) Approximately 1.2km from proposed new access track, near turbine T1.	Residents were not available at time of survey, and no questionnaire response has been received. Consultation with Stirling Council confirms that the property is supplied by a spring source and surface water abstraction however the exact locations of the PWS sources are unknown. No development is proposed within 250m of the property. In addition, no development is proposed upgradient or within the same surface water catchment as the property. It is therefore considered that if the property is supplied by a PWS source, the PWS source is unlikely to be at risk from the Proposed Development. However, details of the PWS source location and any associated pipework should be confirmed prior to construction.	PWS source, if present, is unlikely to be at risk, however PWS source is unconfirmed. PWS source location should be confirmed prior to construction commencing.
PWS03	Easter Cringate	Survey PWS Unconfirmed	E 270494 / N 686894 (property location only) Approximately 1.3km from proposed new access track, near turbine T1.	Residents were not available at time of survey, and no questionnaire response has been received. No information has been provided by Stirling Council however given the rural location of the property it is considered likely that the property is supplied by a PWS source. No development is proposed within 250m of the property. In addition, no development is proposed upgradient or within the same surface water catchment as the property. It is therefore considered that if the property is supplied by a	PWS source, if present, is unlikely to be at risk, however PWS source is unconfirmed. PWS source location should be confirmed prior to construction commencing.

PWS ID (Drawing 10.4.1)	Property Name	Data Source and Source Type	Location of PWS Source and Distance from the Proposed Development	Details	PWS Risk Assessment (see Table 1-2)
				PWS source, the PWS source is unlikely to be at risk from the Proposed Development. However, details of the PWS source location and any associated pipework should be confirmed prior to construction.	

Figures

Technical Appendix 10.4: Private Water Supply Risk Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited
SLR Project No.: 428.V12085.00001

3 August 2026

268000 269000 270000 271000 272000

687000 686000 685000

N

T1 T2 T3 T4

PWS01 PWS02 PWS03

Cairnoch Hill 415

Craigannet Hill 354

Carron Valley

Sir John de Graham's Castle Motte & Bailey

Haugh Hill

Easter Cringate

Sheepfold

Earl's Burn

Quarry (Stone)

Priest's Croft

Burial Gd

Craigannet Craig

Waterfall

Ford

Sluice

Weir

0 0.25 0.5 1

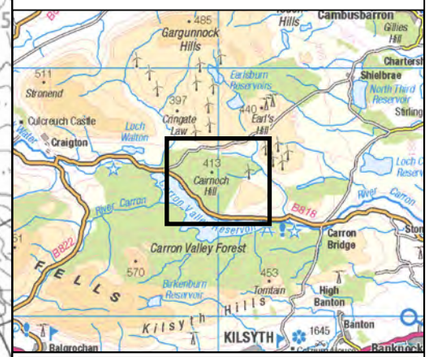
Kilometres

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Blade Laydown Area
- Combined Site Infrastructure 50 m Buffer
- Combined Site Infrastructure 100 m Buffer
- Combined Site Infrastructure 250 m Buffer

Private Water Supply (PWS) Type

- Borehole
- Property with PWS
- Property with PWS (unconfirmed)



Eurowind Energy

SLR

CAIRNOCH HILL WIND FARM

EIAR - TA 10.4 PRIVATE WATER SUPPLY RISK ASSESSMENT

PRIVATE WATER SUPPLY

FIGURE 10.4.1

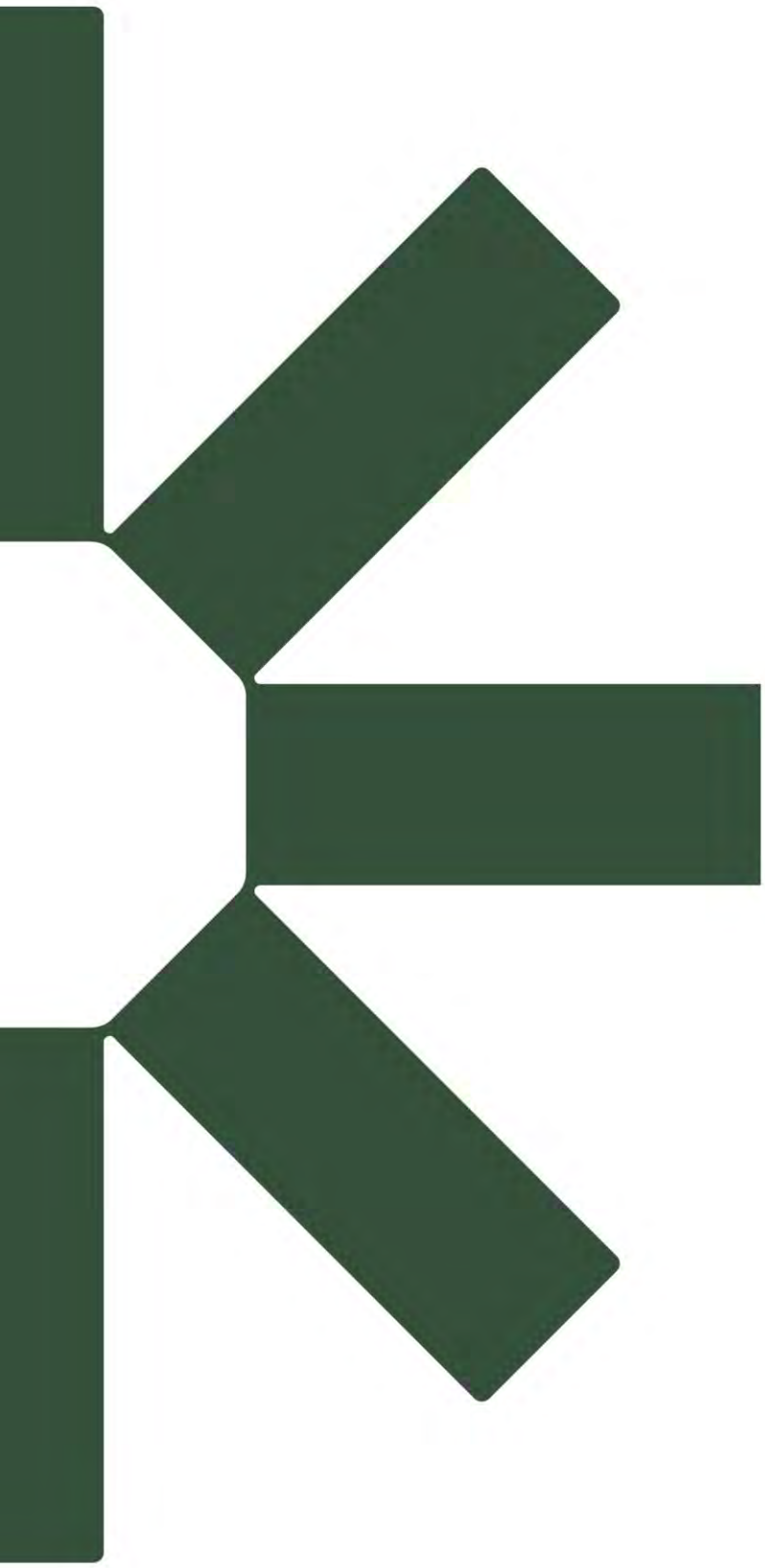
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Date JUNE 2026

428.V12085.00001.0172.0 PWSRA

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Technical Appendix 10.5: Peatland Condition Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

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SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 428.V12085.00001

03 August 2026

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Revision	Date	Prepared By	Checked By	Authorised By
01	03 August 2026	JLD	C. Marshall	C. Marshall

Basis of Report

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1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Eurowind Energy Limited to prepare a peatland condition assessment (PCA) which is required to facilitate construction and operation of the proposed Cairnoch Hill Wind Farm ("the Proposed Development").

This PCA considers the condition of the peatland present at the location of the Proposed Development ("the Site"). The Site is located on Forestry and Land Scotland (FLS) managed land at Cairnoch Hill, within the Lennox Hills, just north of the Carron Valley Reservoir (within 30m). The centre of the Site is at National Grid Reference NS 69768 85606. It lies entirely within the Stirling Council administrative boundary, although is only approximately 420m from the North Lanarkshire Council boundary to the south.

Work on the PCA has been undertaken by a team of Peatland Specialists and Geologists, with over 10 years' experience in undertaking peat assessments and was led by Dr. Chris Marshall, Principal at SLR. Chris holds a BSc (hons) Environmental Geology, an MSc in Geochemistry and a PhD in Earth Sciences, with 10 years of experience in peatland condition and restoration monitoring and assessment including peer reviewed scientific papers, policy documents, governmental reports and membership of scientific and technical advisory groups.

1.2 Scope and Objectives

This Detailed PCA outlines the baseline conditions present within the Site and aims to identify areas of active peatland and ensure that peat disturbance of these areas is minimised where technically feasible during detailed design and construction of the development. The PCA has been undertaken in accordance with best practice guidance [1,2,3,4,5].

The PCA aims to:

1. Quantify the current condition status of peatland habitats on-site.
2. Determine the impact of the Proposed Development on peatland habitats on-site.
3. Inform developmental design and evidence the application of the requirements of the mitigation hierarchy in the Scottish Government's National Planning Framework 4 (NPF4) and the steps that development proposals must follow to reduce their environmental impact namely:
    - **Avoid:** Remove the impact at the outset
    - **Minimise**: Reduce the impact
    - **Restore:** Repair damaged habitats
    - **Offset:** Compensate for any remaining impact, preferably on-site

The PCA included the following data collection activities:

1 Burden, A., Radbourne, A., Williamson, J., Evans C., 2020 A rapid method for basic peatland condition and national-scale satellite analysis

2 Bradley, A.V., Mitchell, E., Dryden, I., Fallaize C., Islam, M,T., Large, D.J., Andersen, R., Marshall C., (In press) Analysis of an InSAR "bog breathing" based classification of peatland condition relative to field observations in Cairnsmore NNR, NatureScot Research Report 1269

3 Crichton Carbon Centre (2015) Annex 1 Field Protocol and Guidance, Developing Peatland Carbon Metrics and Financial Modelling to Inform the Pilot Phase UK Peatland Code' Report to Defra for Project NR0165.

4 JNCC. 1994. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 8 Bogs. JNCC, Peterborough.

5 SNH Peatland Condition Assessment https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf [accessed June 2024]

- Mapping key peatland condition metrics derived from open access satellite imagery including the distribution and cover of bare peat, non-peat habitats and mineral soil; distribution of drainage (both natural and artificial); erosion features (such as foot-paths, hags, gullies, drained pools, and peat landslip scars); and land-use patterns (including burn scars, tracks, and livestock pens). Additionally, the identification of main drainage pathways off-site;
- Combining peatland condition metrics with contextual data regarding the management of the Proposed Development, including ecological and peat depth data gathered at the area of the Proposed Development, and external resources (including deer management group data etc); and
- A field-based peatland condition assessment to validate and provide further information on peatland condition across the Site within a 100m grid.

The data collected is then used to produce a conceptual model derived from the PCA which will guide and demonstrate:

- How peatland condition is distributed across the Proposed Development, address the likelihood of extensive 'active' or near natural peatland being present across the Site and identify areas of particularly good condition peatland or refugia that should be avoided by design;
- How, through Site investigation and iterative design, the Proposed Development has been structured and designed to avoid, so far as reasonably practicable, areas of active peatland; and
- Identify areas of peatland with the greatest potential for enhancement and the opportunities and risks associated with peatland restoration at and within the area of the Site.

2.0 Basis for Peatland Condition Assessment

2.1 Policy Background

NPF4 places significant emphasis on the protection and restoration of peatlands due to their crucial role in carbon storage, biodiversity, and water regulation with relevant policies including;

- **Policy 1**: Addresses the global climate and nature crises, emphasizing the need to protect, conserve, restore, and enhance biodiversity;
- **Policy 3**: Requires developments to provide significant biodiversity enhancements, including restoring degraded habitats and strengthening nature networks; and
- **Policy 5**: Focuses on protecting carbon-rich soils, restoring peatlands, and minimizing soil disturbance from development.

NPF4 Policy 5d, requires that '*where development on peatland, carbon-rich soils or priority peatland is proposed, a detailed site specific assessment will be required*'. This should include peat depth surveys (initial, detailed and additional information), Peat Landslide Hazard Risk Assessment (PLHRA), and detailed habitat surveys (National Vegetation Classification (NVC)), including an assessment of condition. As such under NPF4, any development on peatlands must undergo a detailed site-specific assessment. For the Proposed Alignment the following detailed site-specific assessment has been undertaken:

- **Peat Depth Surveys**: To determine the extent and depth of peat;

- **Peat Landslide Hazard Risk Assessment (PLHRA)**: To assess the risk of peatland instability;
- **Habitat Surveys: Including National Vegetation Classification (NVC)** surveys to assess the types of habitat present; and
- **Peatland Condition Assessment**: to determine the condition of peatland habitat present on Site and guide adherence to the mitigation hierarchy outlined in NPF4 including avoidance of peatland in near natural condition.

PCA in Scotland is generally categorized into four conditions for assessment although Peatland Code subdivides these further to link with emission factors:

1. **Near-Natural**: Dominated by peat-forming species with minimal human impact;
2. **Modified**: Shows signs of human impact such as grazing and burning;
3. **Drained:** Affected by artificial drainage, leading to altered vegetation; and
4. **Actively Eroding:** Characterised by extensive bare peat surfaces and significant erosion.

Priority Peatland Habitats are also assessed by NatureScot and include blanket bogs, montane bogs, and other peat-forming communities. These habitats are considered crucial for biodiversity and carbon sequestration. The guidance emphasises avoiding impacts on these high-quality habitats and is assessed using Joint Nature Conservation Committee (JNCC) Site of Special Scientific Interest (SSSI)[6] criteria.

Ideally (a PCA) in a development context should provide enough information on key condition indicators to:

- Provide a baseline of pre-development condition and likely priority peatland status;
- Guide the location of infrastructure and evidence adherence to the mitigation hierarchy; and
- Provide information on opportunities for and types of compensatory restoration and habitat enhancement on-site.

2.2 Definition of Peat

Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the degree of decomposition. Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material and the peat 'grows' in-situ.

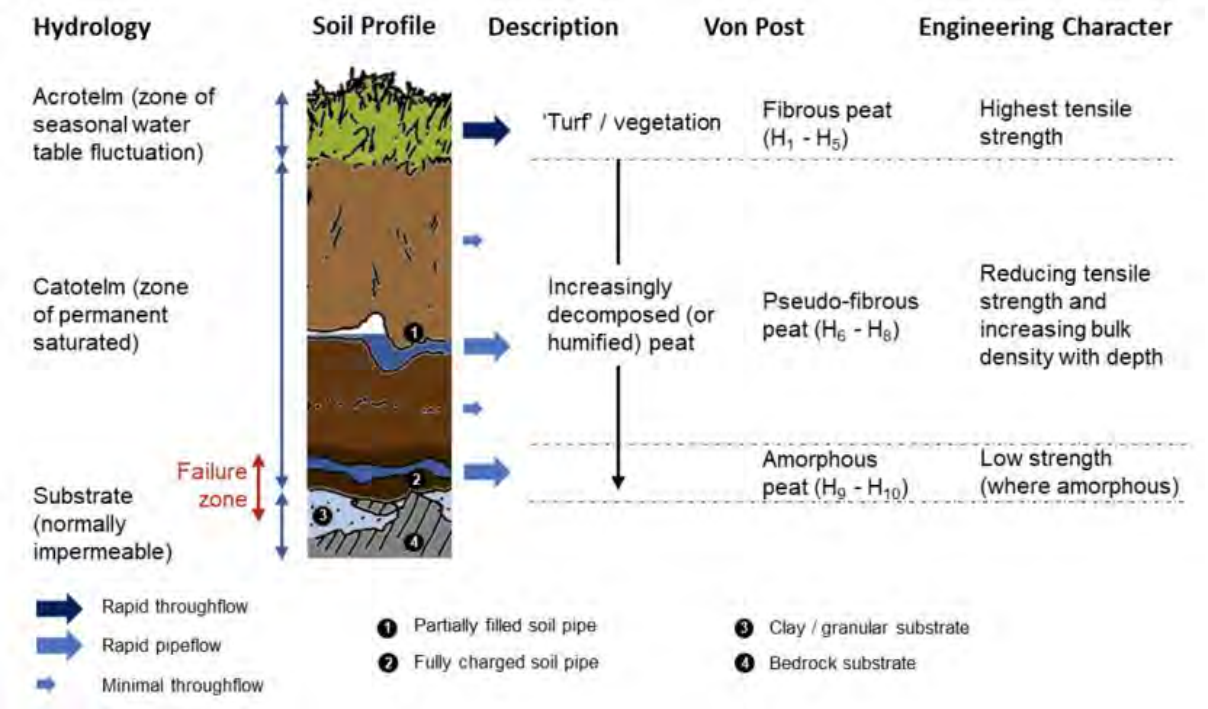
The Scottish Government Peat Landslide Hazard Best Practice Guide (2017) uses the following JNCC report 455 'Towards an Assessment of the State of UK Peatlands' definition for classification of peat deposits:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5m deep;

[6] JNCC. 1994. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 8 Bogs. JNCC, Peterborough.

- Peat: a soil with a surface organic layer greater than 0.5m deep which has an organic matter content of more than 60%; and
- Deep Peat: a peat soil with a surface organic layer greater than 1.0m deep.

Plate 1 - Typical Peat Profile[7]



There are two principal types of peat in a near natural peatland (see **Plate 1**):

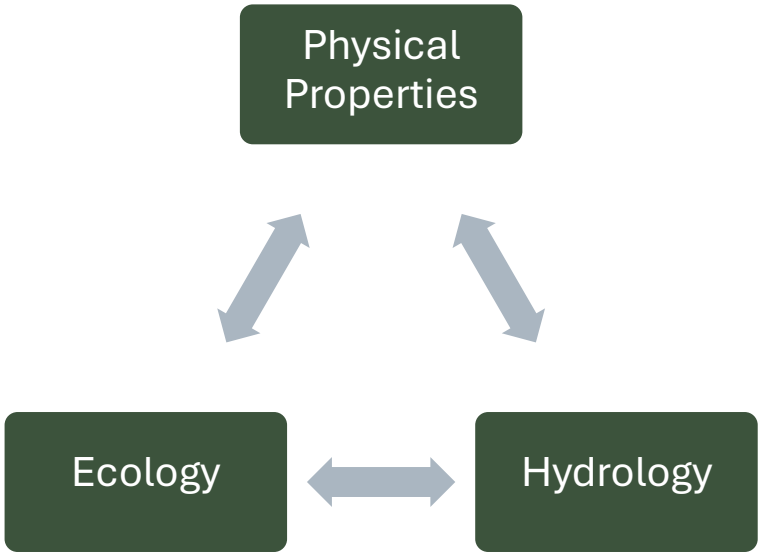
- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1m to 0.6m deep.
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling.

2.3 Definition of Peatland Condition

Peatland condition reflects a combination of the hydrological, physical (mechanical) and ecological characteristics of a peatland (**Plate 2**). In a functioning actively accumulating peatland each exists within a state of dynamic equilibrium acting through a series of negative feedbacks to buffer against external forcing (e.g climate) ensuring the continued growth and development of the peatland. An ecohydrological basis is commonly used to determine peatland condition although often there is a focus on peatland vegetation due to the expertise of ecological assessors and the difficulty in direct measurement of peatland hydrology and peat condition during a single field campaign.

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

Plate 2 - Framework for assessing peatland condition



Various peatland condition assessment protocols exist for blanket peatland in Scotland and elsewhere within the UK focusing on evaluating the health and functionality of peatlands, which are crucial for carbon storage, water regulation, and biodiversity. Common key indicators of peatland condition include the presence of extensive Sphagnum moss, the extent of bare peat, and evidence of grazing or burning. A universally accepted measure of peatland condition does not exist, and is therefore somewhat subjective. Consequently, all peatland condition assessments rely to a certain extent on the interpretation of key metrics by the surveyor. There are also common misconceptions regarding peatland condition for example;

- Vegetation often lags peatland condition for example refugia exist on all but the most degraded peatland and therefore low cover of peat-forming species can be expected even on drained and actively eroding peatlands. Likewise in rewetted peatlands, vegetation often lags hydrology with dry indicator species persisting even after rewetting. The presence of low cover peat forming species is not an indicator of active peatland;
- Key positive indicators such as peatland microtopography can be present in full but each component hydrologically isolated from other parts due to deep incision particularly on upland peats indicating that full functionality is not present; and
- Small scale (Quadrat scale) observations are generally unrepresentative of peat-land condition at larger scale, therefore whilst useful for identifying species pre-sent, peatland hydrology and mechanics often operates on multiple scales not captured by this approach. Also due to canopy effects these measures are often incompatible with remote sensing data limiting their ability to be upscaled using new technologies for monitoring peatland condition e.g. InSAR.

In order to counter this and provide a means of upscaling NVC data across the Site, the PCA uses a combination of a desk study with the field based approach, and metrics based on the rapid peatland condition assessments supplemented by specific information required for the JNCC SSSI selection criteria on a 100m grid. The results can be seen within the following sections of this report namely a desk study of peatland condition indicators on-site and a field validation of peatland condition indicators not visible from satellite imagery followed by in depth analysis of Peatland Condition within the footprint of infrastructure within the Proposed Development.

3.0 Desk Assessment of Peatland Condition

3.1 Site Characteristics

3.1.1 Topography

Elevations across the Site range from approximately 227m AOD at the south western edge of the Site, to approximately 413m AOD in the centre of the Site (summit of Cairnoch Hill).

3.1.2 Hydrology

The local hydrology is shown on **Figure 10.2** of the EIA Report.

Much of the Site is located within the River Carron (Carron Valley Reservoir to Avon Burn) surface water catchment, a part of the larger River Carron (Falkirk) main river catchment. The southern and western extents of the Site are located within the nested catchment of, and drain directly to, the Carron Valley Reservoir with the north eastern and eastern extents of the Site located within the Earls Burn nested catchment flowing generally south westward along the north eastern boundary of the Site before discharging into the River Carron approximately 2.4km east of the Site. The north western extent of the Site is located within the Endrick Water (u/s Blane Water) surface water catchment, a part of the larger River Leven (Loch Lomond) main river catchment, flowing south west from the Site.

The Site is drained radially by multiple unnamed minor watercourses, with the highest concentration of these located in the south of the Site discharging directly into the Carron Valley Reservoir. Four minor watercourses in the north eastern extent of the Site drain into the Earl's Burn, while two drain the north western extent of the Site and discharge into the Endrick Water.

3.1.3 Hydrogeology

Extracts of the BGS 1:625,000 scale regional hydrogeological mapping and 1:100,000 scale aquifer productivity and groundwater vulnerability datasets are presented in **Figure 10.10** of the EIA Report.

This confirms that the bedrock has been classified by BGS as a low productivity aquifer whereby small amounts of groundwater may be present within the near surface weathered zone, secondary fractures and rare springs.

The bedrock geological formations underlying the site are predominantly volcanic member Dinantian extrusive rocks. Due to their restricted intergranular permeability this is characterised as a low productivity aquifer, in which transmission and storage are almost entirely confined to the near surface weathered zone and secondary fractures with all current flow through fractures and discontinuities.

3.1.4 Sensitive Receptors

A review of Naturescot SiteLink webpage confirms there are no designated sites, relevant to this assessment, within the study area.

The Endrick Water, approximately 2km west of the Site, has been designated as part of the Endrick Water SSSI Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). The SSSI and SAC received ecological designations due to their protected species present including Salmon, Brook and River Lamprey alongside the earth science designations for unique fluvial geomorphology and quaternary of Scotland. The designated site is located within the same surface water catchment as the Proposed Development and therefore has

the potential to be hydrologically connected to the Proposed Development. Measures to maintain existing water flow paths and water quality are presented in this assessment and potential effects as a consequence of the Proposed Development on the SSSI and SAC are also considered in **Chapter 8: Ecology** of the EIA Report.

3.1.5 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

Review of the NVC habitat mapping concluded that GWDTE's are sustained by incident rainfall and local surface water runoff, therefore the buffers proposed in SEPAs GWDTE guidance need not apply. Further details on GWDTE are provided within **Chapter 8: Ecology** and **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

A number of potential springs identified by target notes in the NVC survey have been subject to more detailed assessment, as discussed in **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**. Further details on GWDTE are provided within **Chapter 8: Ecology** and **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

3.1.6 Peatland Classification

Peatland classification mapping (see **Figure 10.5** of the EIA Report) shows that majority of the northern extent of the Site is located within Class 4 and Class 5 peatland areas whilst the southern extent of the Site is located within areas largely underlain by mineral soils (Class 0). A small area within the centre of the Site, near Cairnoch Hill, is shown to be underlain by Class 3 peatland. The classification map provides a high-level screening tool to identify potential priority peatland, and should be ground-truthed by detailed site survey.

Class 3 peatlands are not considered priority or of national importance but do retain some fragmented peatland plant communities in the form of wet acidic heath, with some peat deposits present but generally dominated by mineral soils that are not considered to be carbon-rich.

Class 4 peatlands are noted to indicate areas that generally lack peatland vegetation cover, with the potential for minor areas to retain some relict heath habitats. These areas are unlikely to contain significant stores of carbon rich soil, with those peaty soils that are present interspersed with mineral soils. Class 5 peatland indicates areas that lack any peatland habitats or vegetation cover, containing some areas of deep peat and carbon-rich soils, with soils data taking precedence over vegetation.

Class 0 mineral soils are not considered to be peatlands, containing no carbon rich soils or peatland plant communities.

3.1.7 Peatland Habitats

Limited areas on-site, including the summit of Cairnoch Hill and the forestry rides, are the only locations lacking significant forestry cover. These areas made up of a mix of non-priority mire and heath plant communities including MG10 *Holcus lanatus - Juncus effusus* rush pasture, M6 *Carex echinata – Sphagnum recurvum/auriculatum* mire, M23 *Juncus effusus/acutiflorus – Galium palustre* rush pasture and OV27B *Epilobium angustifolium* open grasslands.

Priority peatland habitats were identified in the centre and the northern extent of the Site. These include M20a *Eriophorum vaginatum* mire and M19 *Calluna vulgaris - Eriophorum vaginatum* mire.

The northern area of M20 habitat is approximately 300m from the closest infrastructure of the Proposed Development, with surface water inputs to this area of habitat largely defined by the artificial drainage associated with forestry land use. As such is not considered to be at risk.



The areas of identified M19 and M20 habitat located at the summit of Cairnoch Hill were found to be largely underlain by thin peaty soils with depths generally below 0.5m. In the absence of development, these communities would be degraded and drained, impacted by intensive grazing by deer and colonisation by non-peat-forming plant species including invasive conifer growth. Review of aerial imagery highlights extensive tracking across These tracks act as shallow drains, creating preferential flow pathways for incidental surface water to run downslope and out of the habitat creating a limited draining effect on the mire. Furthermore, the influence of surrounding artificial drainage features associated with forestry works will have a significant effect on the habitat, creating a draining influence on the peat that extends to within the area of M20 habitat. These habitats are already in a state of degradation and modification and therefore unlikely to be significantly affected by the Proposed Development.

3.2 Land Management Context

3.2.1 Agriculture

No agricultural land use practices were noted to be present within the Site.

3.2.2 Deer Management

Deer numbers are currently difficult to determine, it is likely that roe deer are present across the Site however publicly accessible data is unavailable for this region.

3.2.3 Forestry

The majority of the Site is managed for commercial forestry, currently undergoing mixed felling and replanting of crop coniferous species. The Site has a mosaic cover of forestry.

3.2.4 Other Management

Infrastructure Development

Built infrastructure is largely accounted for by tracks serving as access to forestry blocks and existing borrow pits.

3.3 Peatland Condition Indicators

3.3.1 Peat Depth

Peat depth is an important aspect of peatland condition as it is an indicator of:

- Whether peat is present or absent, e.g. where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as ‘peaty soils’. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density;
- Long term peatland resilience to external forcing e.g. thicker peats have consistently sequestered carbon over a longer period than more marginal peat areas; and
- Long term degradation, areas of extensive drainage are likely to have lost peat from oxidation or erosion, alongside compaction which can reduce peat depths further.

Peat surveys were carried out in accordance with best practice guidance for developments on peatland. Phase 1 peat probing resulted in probing on a 100m grid on initial assessment areas

of the Site which was used in preliminary Site layout designs. Phase 2 probing saw detailed probing undertaken across the Site, focussing on proposed infrastructure locations.

The Phase 1 survey informed the Site design such that areas of recorded peat could be avoided where technically feasible. Phase 2 probing was typically undertaken on linear infrastructure (permanent / temporary tracks) at 25m to 50m spacings with offset probing locations either side (approximately 10m to 25m). Infrastructure was typically probed at 10m grid spacings. Peat Depths are presented in **Figure 10.6** of the EIA Report. Further details regarding probing methodologies can be found in **Technical Appendix 10.2: Outline Soils and Peat Management Plan**.

3.3.2 Near Natural Features

No near natural features were observed from aerial imagery. Areas without evidence of drainage or erosion appear to be primarily modified by rough grazing with peatland species replaced by grasses.

3.3.3 Artificial Drainage

Approximately 8.8km of artificial drainage in the form of forestry trunk drains are present at the Site, these appear to be narrow (<0.5m) and active.

Limited peat deposits underlie plantation forestry, which contains a dense network of feeder and collector drains in addition to furrows at approximately 1-2m spacing in these areas.

3.3.4 Peatland Erosion

No largescale complexes of peatland erosion were identified on-site. Much of the understory of dense forestry is considered to be functionally bare peat due to the high shading caused by the tree canopy and as such complexes of micro erosion are expected, however due to the limitations of survey scope the effects of such erosion are considered to be in line with those classed as Modified or Drained peatlands.

3.3.5 Peatland Tracks

Approximately 4.6km of tracks, primarily associated with forestry usage, are present at the Site. This is likely to be an underestimate due to the density of tracks observed with aerial imagery in some portions of the Site. Herbivore tracking likely associated with resident deer populations were also noted across multiple areas of the Site. Track impact is therefore considered artificial drainage within this report, although due to the likely shallow nature of impacts, a reduced impact radius of 10m is applied.

Artificial drainage, land use and erosional features are presented in **Figure 10.7** of the EIA Report.

3.4 Peatland Condition Assessment

Key peatland condition metrics have been mapped, through a desk-based review. Peatland at the Site is entirely comprised of peatland in a Drained Artificial Condition with approximately 62.75Ha (100% of the peat areas) in this class. Primarily associated with active forestry drains and forestry tracks.

The minor area of peatland in the centre and north of the Site is further classified as **Modified Condition** (1.4% of peat areas). These areas comprise those noted to contain priority peatland habitats, some of the only unforested portions of the Site. It is likely that these areas have high historic herbivore impacts include trampling and fertilisation by deer,

alongside invasive colonisation of conifer species, which has contributed to the degradation of these habitats.

Peatland condition is displayed in **Figure 10.7** of the EIA Report.

3.4.1 Field Based Observations

During peat depth surveys, observations on peatland condition were made across the Site to validate aerial observations. Land-use on-site was largely confirmed to be commercial forestry, with forestry blocks noted to be of mixed age and species and landcover largely a mosaic of mature, felled and replanted areas. These areas are fed by an extensive network of furrows, feeder & collector drains that were ubiquitous.

Photograph 1: Extensive drainage network within forestry across the Site.



Peat deposits are generally confined to topographic depressions caused by the undulating surface of the underlying glacial deposits, with drier areas of shallow peaty and mineral soils between. Peat density is likely high across the Site indicating widespread effects of compaction and drying, likely exacerbated by the commercial forestry operations on-site.

Photograph 2: Mixed age forestry noted across the Site.



Peatland plant communities across the site were noted to be highly modified and in large areas completely absent. Sphagnum species were seen across multiple areas of the Site, generally located in topographic depressions within forestry stands, forestry rides and along the northern boundary of the Site. Sphagnum species diversity was generally assigned to the Small & Thin category highlighting species, including *S. capilofolium* and *S. fallax*, that have less significant vegetative structure and as such contribute to peat accumulation at a slower rate. These species were regularly seen growing alongside significant non-peat forming mosses.

Photograph 3: *Sphagnum sp.* cover alongside non-peat forming moss species.



The majority of the Site, not underlying forestry, has abundant levels of other grass and *Juncus sp.* cover, an indicator of highly modified peatland conditions while peat forming sedges including cotton grass and deer grass appear less frequently across the Site, further

indicating a conversion from wetter raised peatland habitats to rough grazing and wet heath. Widespread deer signs were noted across the Site, with tracks evident in open areas on aerial imagery. In addition to the mixed commercial forestry, small areas of planted semi-natural woodland are present across the Site, generally along forestry buffers and at the southern boundary of the Site.

Photograph 4: Plant communities showing dominant cover of non-peat forming species across the Site.



4.0 Infrastructure Assessment

The following section presents an overview of the peatland impacts of the Proposed Development infrastructure.

4.1 Turbines and Associated infrastructure

Two of the proposed wind turbines (including crane hardstandings), T2 & T3 are located on soil deposits with average depths <0.5m, T1 & T4 are located on peat deposits, with an average depth of 0.5m and 1.0m respectively. All wind turbines are located within areas in afforested peatland in the drained artificial class. These areas are dominated by monoculture plantation with intensive drainage by furrows, feeder and collector drains. Beneath the canopy the peat surface comprises dry dense peat dominated by needle litter and non-peatland mosses. It is considered likely that peat structure is also highly disturbed at this location, due to the ploughing techniques used. A conservative peatland condition assessment of the wind turbines located on peat would be Drained Artificial due to the lack of afforested peat within both the Peatland Code and NatureScot Peatland Condition Assessment guidelines and the longstanding land management practices in the area.

Overall, wind turbines on afforested peat are likely to be actively degrading and therefore peatland impacts are likely to be **Low**.

4.2 Peatland Tracks

New and upgraded tracks that form part of the Proposed Development largely avoid peat deposits.

Small sections of proposed access track north of T4 and confined areas of the track west of T1 and south west of T2 are located on peat deposits in areas entirely within areas of plantation forestry.

A conservative peatland condition assessment of the areas of these proposed tracks on peat would be Drained Artificial**,** due to the lack of afforested peat within both the Peatland Code and NatureScot Peatland Condition Assessment guidelines. Overall, the proposed tracks located on afforested peat are likely to be actively degrading and therefore peatland impacts are likely to be Low.

4.3 Borrow Pits

The location of the proposed borrow pit is sited within an existing excavation, likely used for track maintenance serving the current forestry land use on-site. The surrounding area is entirely within areas of plantation forestry lacking any significant peat deposits and as such is excluded for further assessment.

4.4 Construction Compounds and Ancillary Infrastructure

The proposed substation compound avoids peat entirely and is excluded from further assessment.

Two proposed temporary construction compounds are located in the eastern and southern extents of the Site, overlying confined peat deposits in areas entirely within plantation forestry.

A conservative peatland condition assessment of the areas of these proposed temporary compounds on peat would be Drained Artificial, due to the lack of afforested peat within both the Peatland Code and NatureScot Peatland Condition Assessment guidelines. Overall, the proposed temporary compounds located on afforested peat are likely to be actively degrading and therefore peatland impacts are likely to be Low.

4.4.1 Priority Peatland Habitat

NatureScot guidance *'Advising on peatland, carbon-rich soils and priority peatland habitats in development management'*[8] provides information to define habitats likely to be considered 'priority peatland habitat'.

It is noted, based on available habitat and botanical survey data, that bog habitats are present as hydrologically isolated and highly modified fragments across the Proposed Development. These areas are distant from the Proposed Development and although are located within the Site, are not expected to be at risk from any potential impacts related to the Proposed Development and as such are not considered further in this assessment.

[8] NatureScot, 2023. Advising on peatland, carbon-rich soils and priority peatland habitats in development management. Revised November 2023. NatureScot. Available at: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management [Accessed 19 Sep. 2025]

5.0 Proposed Development Conclusions

The areas of the Proposed Development with underlying peat deposits were found to be extensively drained and modified commercial forestry. This has led to a loss of microtopography and peatland plant species diversity associated with active peatland function, with extensive colonisation of non-peatland plant communities forming across the Site in areas outwith commercial forestry stands.

Drainage features associated with commercial forestry operations located within the Site were ubiquitous, promoting significant draining effects on the peat present. The majority of infrastructure and wind turbine locations are designed to occur on areas lacking significant peat deposits with those unable to avoid peatland located in areas with extensive drainage and degraded condition indicators. The infrastructure and wind turbines that comprise the Proposed Development are overall likely to be of Low impact to peatland condition and the habitats affected are unlikely to fall under priority peatland habitat guidelines.

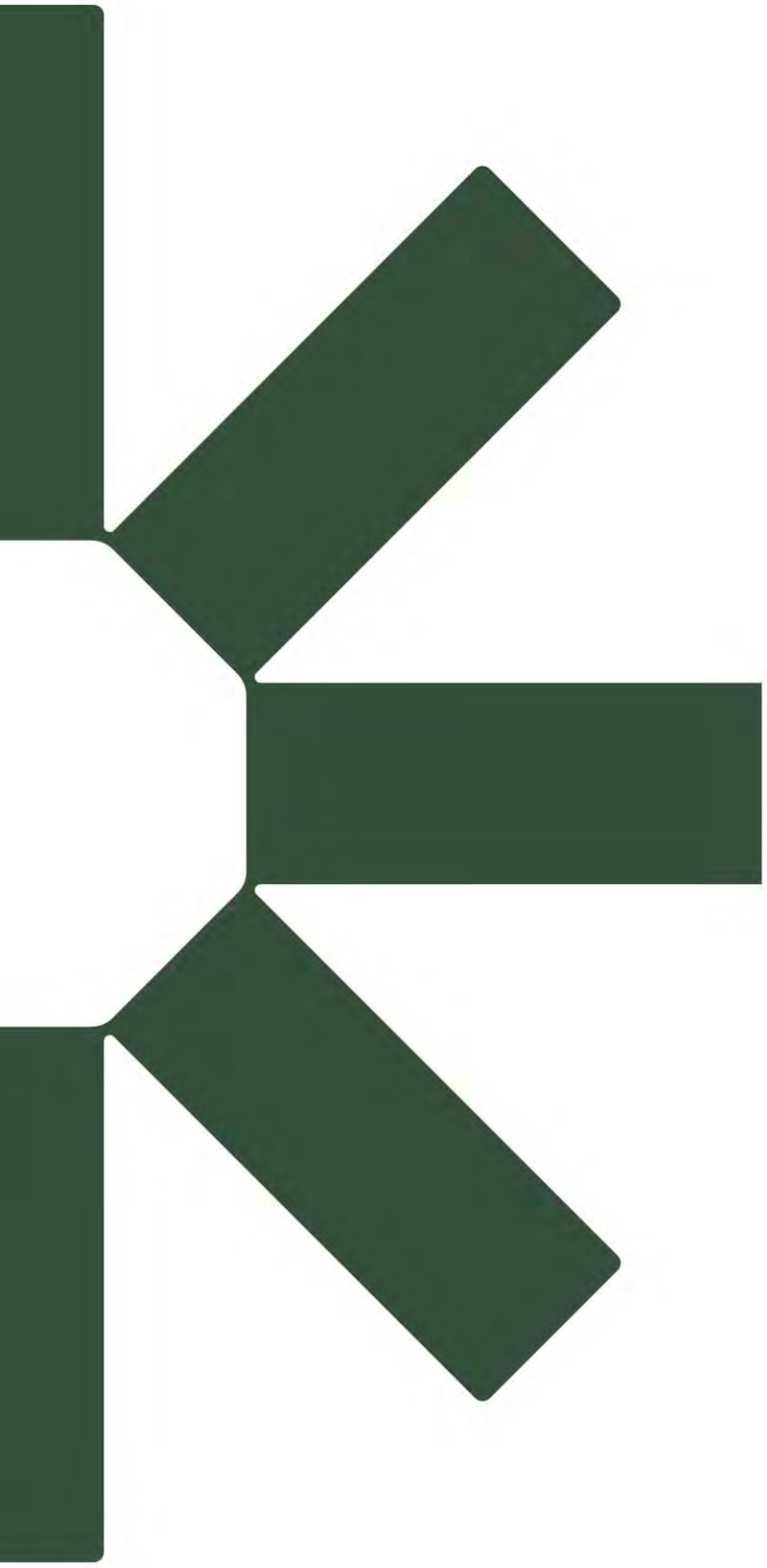
Following the above assessment, the following detailed conclusions can be made in relation to the Proposed Development.

5.1.1 Turbines and Turbine Locations

Overall, the impacts of wind turbines and associated infrastructure is considered to be Low, due to the extensively drained and modified nature of peat across the Site. All wind turbines are located, in part, on peat. All wind turbines are located entirely in afforested areas, with intensively drained and modified peatland conditions present. Due to the extensive drainage network and disturbance of peat across these areas it is likely these peatlands are actively degrading over time.

5.1.2 Tracks

Overall, the impact of proposed new and upgraded tracks in peatland habitats is considered to be low due to the extensively drained, modified and actively eroding nature of peat at the Site. Of the tracks in areas with peat deposits, such as sections of track servicing wind turbines 1, 2 and 4, the peat deposits are identified as extensively modified and drained, and located entirely within areas of plantation forestry with extensive colonisation of non-peatland plant species on open ground.



Making Sustainability Happen

Technical Appendix 10.6: Borrow Pit Appraisal

Cairnoch Hill Wind Farm

Eurowind Energy Limited

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SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	3 August 2026	L. Brunton	R. Watson	A. Huntridge

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Eurowind Energy Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Figure 10.6.1: Borrow Pit Design

Annexes

Annex A Aggregate Assessment

1.0 Introduction

SLR Consulting Ltd (SLR) was commissioned by Eurowind Energy Limited ("the Applicant"), to undertake a Borrow Pit Appraisal (BPA) for the proposed Cairnoch Hill Windfarm ("the Proposed Development").

The Proposed Development would comprise of up to four wind turbines with associated infrastructure including a permanent anemometer mast, access tracks, crane hardstandings, a borrow pit, a substation compound and temporary construction compounds. **Figure 3.1: Site Layout** of the Environmental Impact Assessment (EIA) Report, shows the location of the Proposed Development ("the Site") and the layout of the Site infrastructure. Full details of the Proposed Development are provided in **Chapter 3: Description of the Development** of the EIA Report.

There have been substantial surveys undertaken to date at the Proposed Development to inform the proposed borrow pit(s), including Site reconnaissance visits and several phases of peat probing which are detailed within **Technical Appendix 10.1: Peat Landslide and Hazard Risk Assessment (PLHRA)** and **Technical Appendix 10.2: Outline Soils and Peat Management Plan (SPMP)**.

The principal objective of this report is to provide an initial assessment of the aggregate requirements for the Proposed Development and identify the potential borrow pit locations suitable for providing this aggregate.

The proposed borrow pit search area reviewed within this report was selected because of morphology, accessibility from proposed tracks, orientation and the expected proximity to suitable rock close to the surface with consideration of other site constraints including sensitive receptors. The proposed borrow pit for the Proposed Development is an extension of an existing borrow pit.

The proposed borrow pit search areas have been selected based on areas where peat coverage is limited and where bedrock may outcrop and potential aggregate reserves are expected to occur near the surface.

The work has been undertaken by a team of Geotechnical Engineers and Geologists with over 17 years' consultancy experience in undertaking borrow pit and geological assessments. The team was led by a Chartered Hydrogeologist with 30 years' consultancy experience and specialising in the assessment of soils, geology and water for renewable power projects in Scotland.

2.0 Desk Based Review

This assessment has been completed through a largely desk-based review of soil and geological maps and Ordnance Survey (OS) contour data with site reconnaissance undertaken by a geologist and geotechnical engineer, to cross-check the geological desk-based review.

2.1 Site Description

The Site is located immediately north of Carron Valley reservoir and approximately 10km west of Denny, centred at National Grid Reference (NGR) NS 69768 85606. The Site is located in an area of commercial forestry with minor pockets of open moor and heathland.

Access to the Site is gained off the B818 via existing forestry tracks.

Information and historic maps from the National Library of Scotland[1] indicate that the Site has experienced limited changes over time. From the OS One Inch 1885-1900 map, the Site is shown to have comprised of open undeveloped moorland. The historic map and aerial imagery review indicates that the majority of the Site was utilised for sheep farming.

2.2 Topography

From review of OS mapping, the topography across the Proposed Development consists largely of gentle sloping terrain that rises towards Cairnoch Hill.

Average ground elevations across the Site are noted to range from average approximately 227m Above Ordnance Survey (AOD) near Carron Valley Reservoir at the southern boundary of the Site, to the local highpoint of Cairnoch Hill in the centre of the Site at 413m AOD.

2.3 Geology

2.3.1 Artificial Ground

Based on the information available from the BGS Geoindex[2], no made ground deposits are present across the Proposed Development.

2.3.2 Superficial Geology

Based on the available BGS online data[2], the Proposed Development consists of variable superficial deposits including Devensian Till (generally mapped in the east, south and west, with isolated areas in the centre and north), Hummocky (Moundy) Glacial Deposits (encroaching the Site boundaries to the north east, south and west), Peat (very small areas towards the north east and south) and Alluvium (very small areas encroaching the north east and south and south). Superficial geology BGS mapping is presented on **Figure 10.4: Superficial Deposits** within **Chapter 10: Hydrology, Hydrogeology, Geology and Soils**.

2.3.3 Bedrock Geology

Based on the available BGS online data[2], the majority of the Site is underlain by basalt bedrock of the Campsie Lava Member (mapped in the south, west and north) and the Gargunnock Hills Lava Member (mapped in the centre and east). Additionally, basalts of the Spout of

[1] National Library of Scotland, Map Finder Available from: https://maps.nls.uk/geo/explore/side-by-side/

[2] BGS Online Viewer, available at [https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.133433804.376188765.1646739904-1030004651.1646739904]

Ballochleam Lava Member (mapped along the northern boundary) and the Overton Lava Member (encroaching the north east boundary).

Igneous intrusive rocks are also noted within the Site comprising felsite and basaltic rocks of the Dinantian Dykes (present in an isolated area in the north) and Waterhead Central Volcanic-Complex (present in two isolated areas in the south).

Bedrock geology BGS mapping is presented on **Figure 10.8: Bedrock Geology**.

2.3.4 Structural Geology

Based on available BGS online data[2] various linear features are present across the Proposed Development, all of which are denoted as being downthrow faults located along the north west (trending south west to north east), centre (trending south west to north east), west (trending west to east) and southeastern corner (trending south west to north east).

2.4 Aerial Photography

The OS mapping and aerial photography do not indicate frequent bedrock exposures across the Proposed Development. Site visits noted small bedrock outcrops which were not identified to be extensive.

3.0 Borrow Pit Assessment

This section of the report provides an assessment of the potential borrow pit search area location with an evaluation of its potential to meet the Proposed Development's aggregate requirements. It should be noted that the potential borrow pit search area is an extension of the existing borrow pit located in the Proposed Development.

The assessment has been completed through a desk-based review of geological maps and memoirs and is supported by several Site visits from SLR geologists and a geotechnical engineer. Potential borrow pit locations were inspected visually with a view to assessing ground conditions and to help determine the borrow pit's suitability for use during construction of the Proposed Development.

In exploring the potential borrow pit search area location, as defined on **Figure 10.6.1**, consideration has been given to the practical aspects of the borrow pit. The main aspects to consider are as follows:

- Ease of access;
- Rock type;
- Overburden thickness;
- Topography;
- Current and historical uses;
- Proximity to construction activities;
- Visual impact; and
- Impact on environmentally sensitive areas.

Steeper topography is preferable for quarrying, where peat and soils coverage will be limited. Careful consideration was given to landscape and visual impacts, and other environmental aspects including proximity to watercourses and other constraints. The proposed borrow pit is in an area where the peat cover is typically thinner or vacant and aggregate reserves are expected to occur near the surface.

3.1 Aggregate Requirements

The proposed wind turbine locations and their subsequent maintenance would require the construction of a purpose-built network of access tracks. These tracks would be single track with occasional passing places, un-metalled and would be constructed to the wind turbine suppliers' specifications conforming to the Specification for Highway Works (SHW)[3].

The indicative volumes of aggregate required for site infrastructure are summarised in **Table A** based on the materials calculator provided in **Annex A**.

The aggregate requirements below have been calculated based on an estimate of aggregate volumes required.

[3] Highways Agency, Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works, Series 600 Earthworks, Published February 2017.

Table A: Aggregate Requirement Summary

Infrastructure Element	Volume of Aggregate Required (m^3)
New Excavated Track	6,954
Existing Upgraded Track	11,108
Turbine Bases	1,413
Fill above Turbine Bases	4,920
WTG Concrete Foundation Aggregate	2,100
Permanent Hardstandings	14,800
Temporary Hardstandings	7,600
Blade Laydown Area	640
Substation	4,000
Temporary Construction Compound	12,000
Total	**65,535**

It has been estimated that approximately 65,535m^3 of suitable quality rock would be required to construct the Proposed Development. This includes SHW[4] classes 6F2, 6N/6P and concrete aggregate. If rock quality is not suitable for each of these engineered materials, then there may be a requirement for imported materials.

No account has been taken in the calculations for the fortuitous 'winning' of rock during the construction phase for example during infrastructure excavations. If such rock was available, the amount extracted from the borrow pit could be reduced.

3.2 Borrow Pit Assessment

This section of the report provides an assessment of the borrow pit search area together with an evaluation of its potential to meet the Proposed Development's aggregate requirements. The indicative Borrow Pit design within the search area is detailed within **Figure 10.6.1** (BP1).

The borrow pit could be extended or reduced in size depending on review of aggregate requirements and/or ground investigation data which would be obtained from a detailed geotechnical survey which would be undertaken prior to construction if the Proposed Development was consented.

The geology encountered within the Proposed Development is supported by BGS geological maps. The dimensions of the borrow pit, volume of superficial material to be removed and volumes of Site won rock for the borrow pit have been estimated based on cross-sections developed through a digital terrain model. These are required to be confirmed by future intrusive ground investigation works.

3.2.1 Borrow Pit 1

Borrow Pit 1 is located in the central area of the Proposed Development to the west of Cairnoch Hill, with the approximate National Grid Reference (NGR) NS 69016 85790. Photograph 1 shows the extent of the existing borrow pit. Table B below, details the relevant characterises and dimension for the Proposed Borrow Pit.

Photo 1: BP01 facing east towards the existing borrow pit, taken from NGR: NS 68964 85792.



Table B: Borrow Pit 1

Borrow Pit 1	
Superficial Geology	Glacial Till
Bedrock Geology	Campsie Lava Member (Basalt)
Inferred Design Parameters	Overall slope 45° Maximum face height 15m
Gradient	Slope increasing towards the east
Details of Extraction	Combination of digging, drilling and blasting
Estimated Excavation Area	9,119m^3
Estimated Excavation Volume	73,342m^3

3.3 Aggregate Volume Assessment

As shown in Section 3.1, an estimated 65,535m^3 of suitable quality rock would be required to construct the Proposed Development. The proposed borrow pit is likely to be capable of producing 73,342m^3 of aggregate. This will likely provide a surplus of approximately 7,808m^3, with the volume from the proposed borrow pit adequately supplying the volume required for the construction of the Proposed Development.

4.0 Indicative Borrow Pit Design

The indicative borrow pit volume is presented in **Table B**. The design of the borrow pit anticipates extracting a net stone volume suitable for the requirements of the Proposed Development, excluding imported top surface dressing which would require importing. This target capacity has been determined based on the estimated requirements for construction materials together with additional allowances for overburden material. It is envisaged that overburden/soils together with processed materials would be carefully stored adjacent to the excavation void.

4.1 Marking Out and Overburden Stripping

The permitted extents of the borrow pit would be marked out with pegs, and overburden, including topsoil, subsoil and weathered rock horizons, would be stripped from within this delineated area.

The overburden and weathered rock horizons would be stripped using a combination of crawler tractor dozers and backtrackers with the material loaded by loading shovels. The overburden (including surface vegetation turves) would be carefully stripped and stored as a series of separate turves, topsoil, subsoil and weathered rock storage mounds to be used for reinstatement purposes.

4.2 Excavations within Rock

Once overburden and weathered rock horizons have been stripped, and stored, a suitably qualified geotechnical engineer/blasting engineer would assess the nature of the underlying solid rock strata. The engineer would provide advice on suitable extraction techniques including; extraction method, bench and cut face design parameters, and blasting design (if required).

If blasting is required, blasting would be undertaken in accordance with the Quarries Regulations 1999[4] and Annex D PAN 50[5].

A combination of digging, ripping and blasting would be utilised to excavate rock (subject to the nature of the material encountered, depth of weathering and level of fracturing) which would be processed using a mobile crushing and screening plant, which would be sited within the base of the working borrow pit.

4.3 Stockpiling of Materials

The initial overburden strip would be stored within temporary screening mounds around the perimeter of the borrow pit. The screening mounds would be at least 1.5m in height.

The remaining unsuitable materials (weathered/unsuitable rock horizons) would be stockpiled within the base of the working borrow pit. The stockpiles would have a maximum height of 5m, with maximum side-slope gradients of 1(Vertical (V)) in 2.5(Horizontal (H)) and be in full compliance with the Quarries Regulations 1999 and Quarries National Joint Advisory Committee (QNJAC) Guidelines[6].

4 Health and Safety Executive (2014), Health and Safety at Quarries, Quarries Regulations 1999, Approved Code of Practice and Guidance (Second Edition).
5 Scottish Government (2000), PAN 50 Annex D: Controlling the Environmental Effects of Surface Mineral Works.
6 Quarries National Joint Advisory Committee (2020), Available at: http://qnjac.co.uk/what-is-qnjac/. Last accessed April 2020.

4.4 Access Tracks/Haulage Routes

The proposed access to the borrow pit would involve upgrading the existing access track that exists for the current borrow pit. The access tracks would include suitable roadside drainage ditches, with soakaways located, where appropriate.

The tracks (haulage routes) within the borrow pit would have a gradient of no steeper than 1(V) in 10(H).

4.5 Water Management/Drainage

The borrow pit would feature a perimeter surface drain, which would aim to prevent water in-flow into the borrow pit. The water collected within the surface drains would be discharged either into the surrounding vegetation, or into suitably located settlement lagoons.

Where necessary, surface settlement lagoons would be constructed within the borrow pit. These would be constructed with the aim of containing any surface water collection within the excavation voids, and from collection of water from the perimeter surface drains. The lagoons would be contained within a bunded area at the base of the borrow pit, with suitable pumping systems installed allowing water to be pumped to soakaways as required.

4.6 Restoration

Following the completion of construction, the onsite borrow pit would remain open (not restored), in order to allow its ongoing use by Forestry and Land Scotland.

5.0 Conclusion

In summary, the borrow pit search area has been assessed as being capable of supplying all the aggregate required for the proposed development. An estimated 65,535m^3 of suitable quality rock would be required to construct the Proposed Development. The proposed borrow pit is likely to be capable of producing 73,342m^3 of aggregate. Therefore, it is unlikely that non-site won imported rock will need to be imported, with the proposed borrow pit producing a likely surplus of 7,808 m^3.

The locations and methods of working would be managed to cause minimal impact to the ground conditions and water environment. The borrow pit design and recommended methods of operation are in line with the Quarries Regulations, Approved Code of Practice, 1999[7] (as amended) to provide a safe working environment and minimise risk of instability.

An approximate volume of excavated materials has been calculated for the proposed borrow pit location within the borrow pit search area, the volumes are based on initial calculations based on assumptions for the Proposed Development. These calculations would be verified by detailed intrusive investigation at the proposed locations, post-consent. Calculations do not take into consideration the 'winning' of materials along the route. The proposed borrow pit selected could be increased or decreased in size, depending on the aggregate requirements or following an assessment of the suitability of aggregate materials following detailed ground investigation.

The quality of rock anticipated onsite is inferred from a visual assessment of rock outcrops and published information. An intrusive ground investigation, sampling and material laboratory testing will be required to confirm ground condition and suitability.

Prior to the construction of the proposed development, design and best practices, any required mitigation measures, would be set out in full within a Construction Environmental Management Plan (CEMP) and would be secured by an appropriately worded pre-development condition of consent.

[7] Health and Safety Executive (2014), Health and Safety at Quarries, Quarries Regulations 1999, Approved Code of Practice and Guidance (Second Edition).

Figures

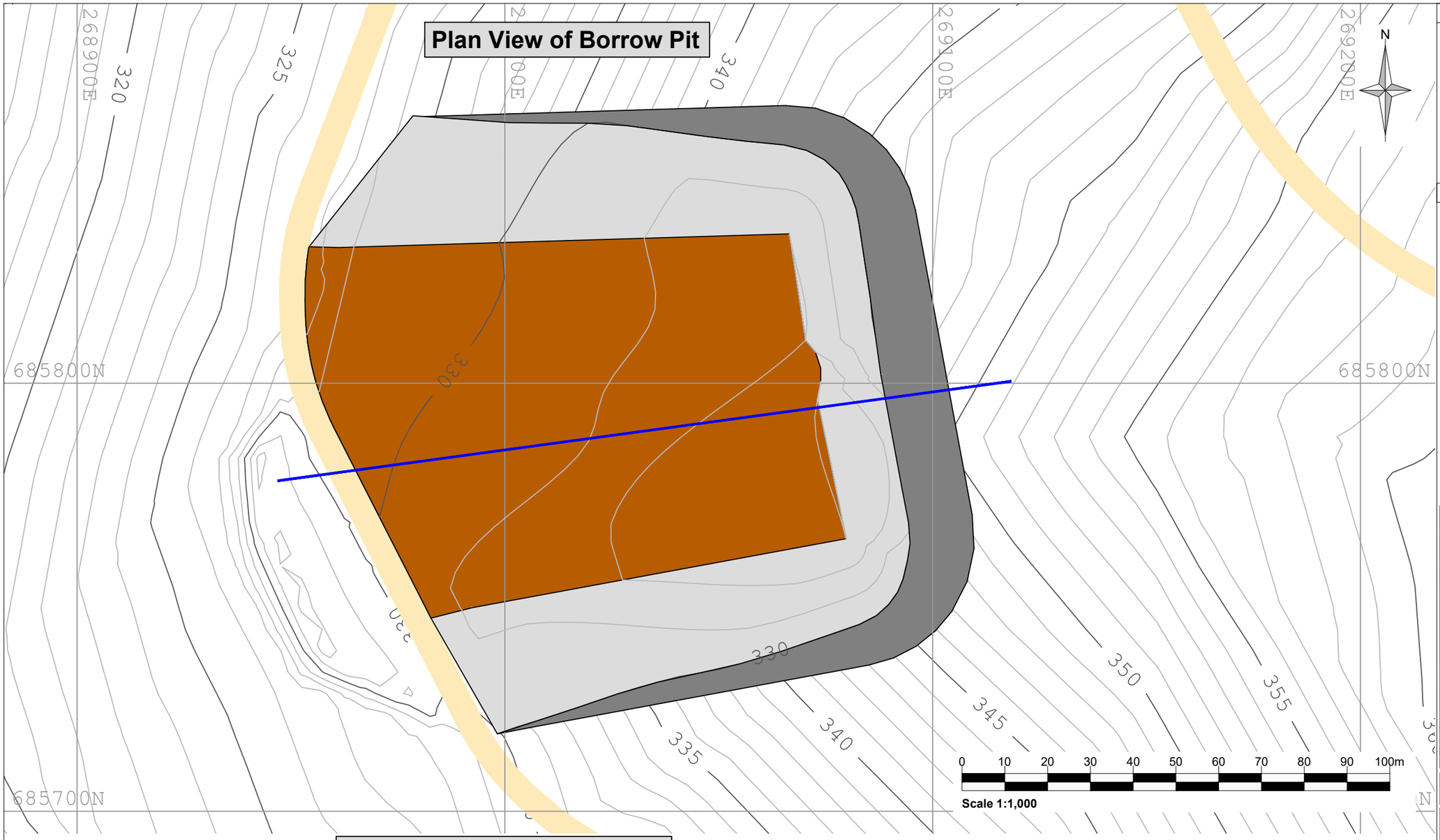
Technical Appendix 10.6: Borrow Pit Appraisal

Cairnoch Hill Wind Farm

Eurowind Energy Limited

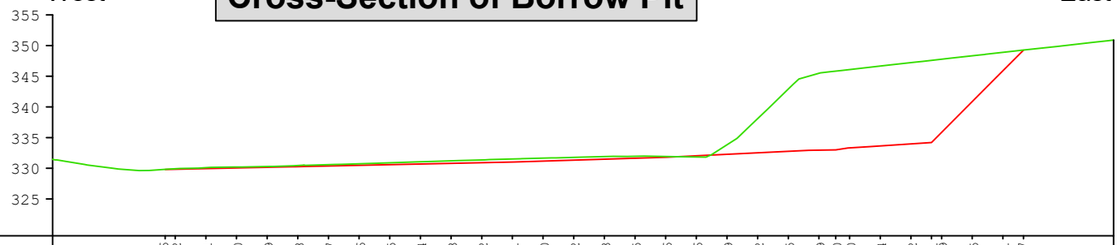
SLR Project No.: 428.V12085.00001

Plan View of Borrow Pit



Scale 1:1,000

Cross-Section of Borrow Pit



Datum 319.0

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Annex A Aggregate Assessment

Technical Appendix 10.6: Borrow Pit Appraisal

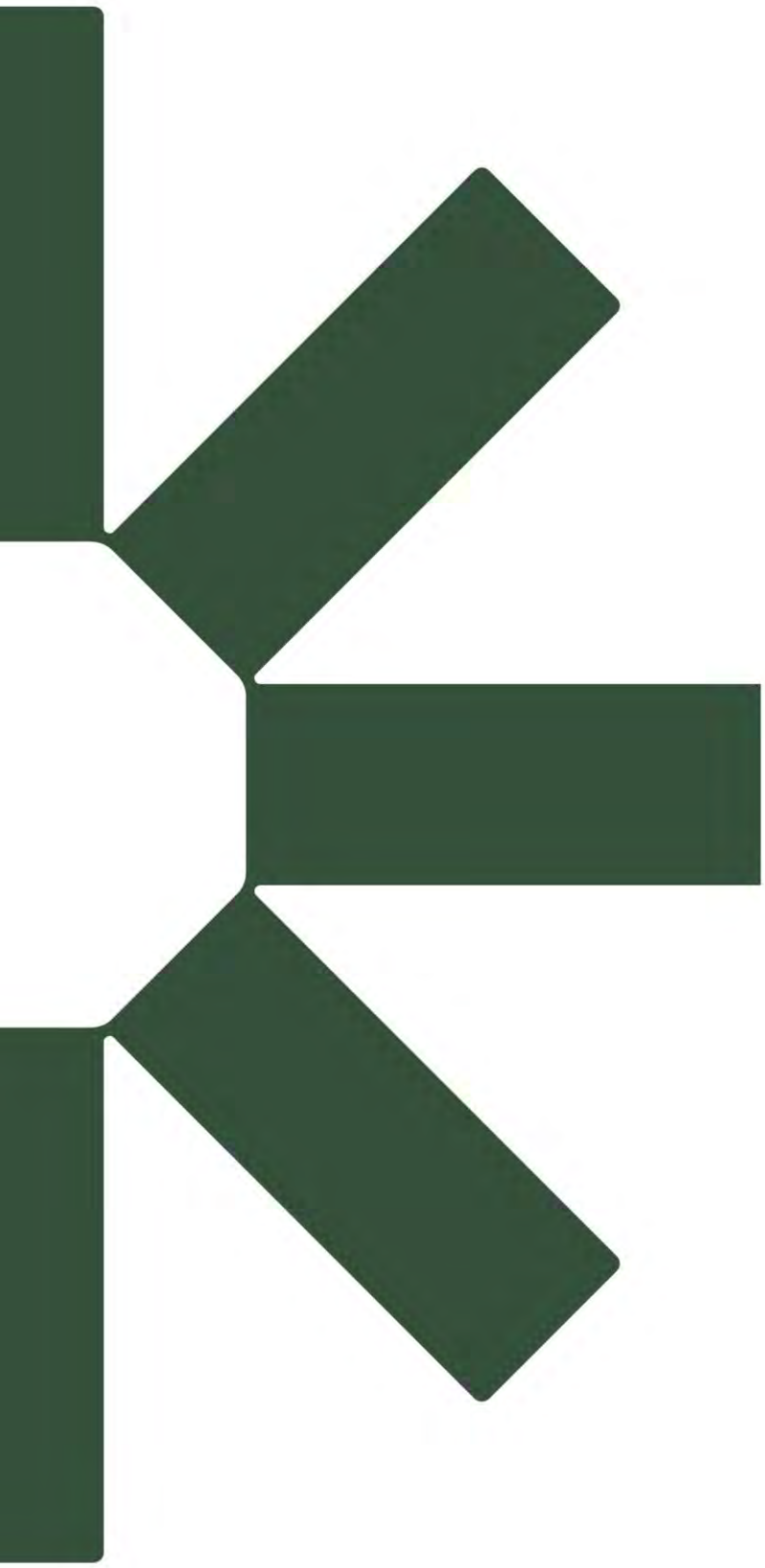
Cairnoch Hill Wind Farm

Eurowind Energy Limited

SLR Project No.: 428.V12085.00001

Infrastructure	Length (m)	Width (m)	Area (m2)	Aggregate Thickness (m)	Number	Aggregate Volume (m^3)	Notes:
Excavated Track	2318	6	13908	0.5	1	6954	Assumes 6m wide track
Upgraded Track	7405	3	22215	0.5	1	11108	Assumes 3m wide upgrade
Turbine Bases - formation only			707	0.5	4	1413	Assumes 30m diameter
Fill above Turbine Bases			1140	2	4	4920	Volume of 1no. foundation = 1050m^3
WTG Concrete Foundation Aggregate					4	2100	Assumes proportion of aggregate is 0.5 of 1m^3. Volume of 1no. foundation = 1050m^3
Permanent Hardstandings			3700	1	4	14800	
Temporary Hardstandings			1900	1	4	7600	
Blade Laydown Area			640	1	1	640	
Substation			4000	1	1	4000	
Temporary Construction Compound			12000	1	1	12000	
Total Requirement						**65535**	All volumes measurements in m^3, based on turbine requirements and information provided by Client

Potential Volume of Rock to be sourced on site	
BP1	73342
Total Volume from Site (m^3)	73342
Surplus Volume (m^3)	7808
minus 15% contingency (m^3)	6789



Making Sustainability Happen

Technical Appendix 11.1: Gazetteer of Heritage Assets within 1km of Proposed Development

Cairnoch Hill Wind Farm

Eurowind Energy Limited

58 Morrison Street, Edinburgh, Scotland, EH3 8BP

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SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

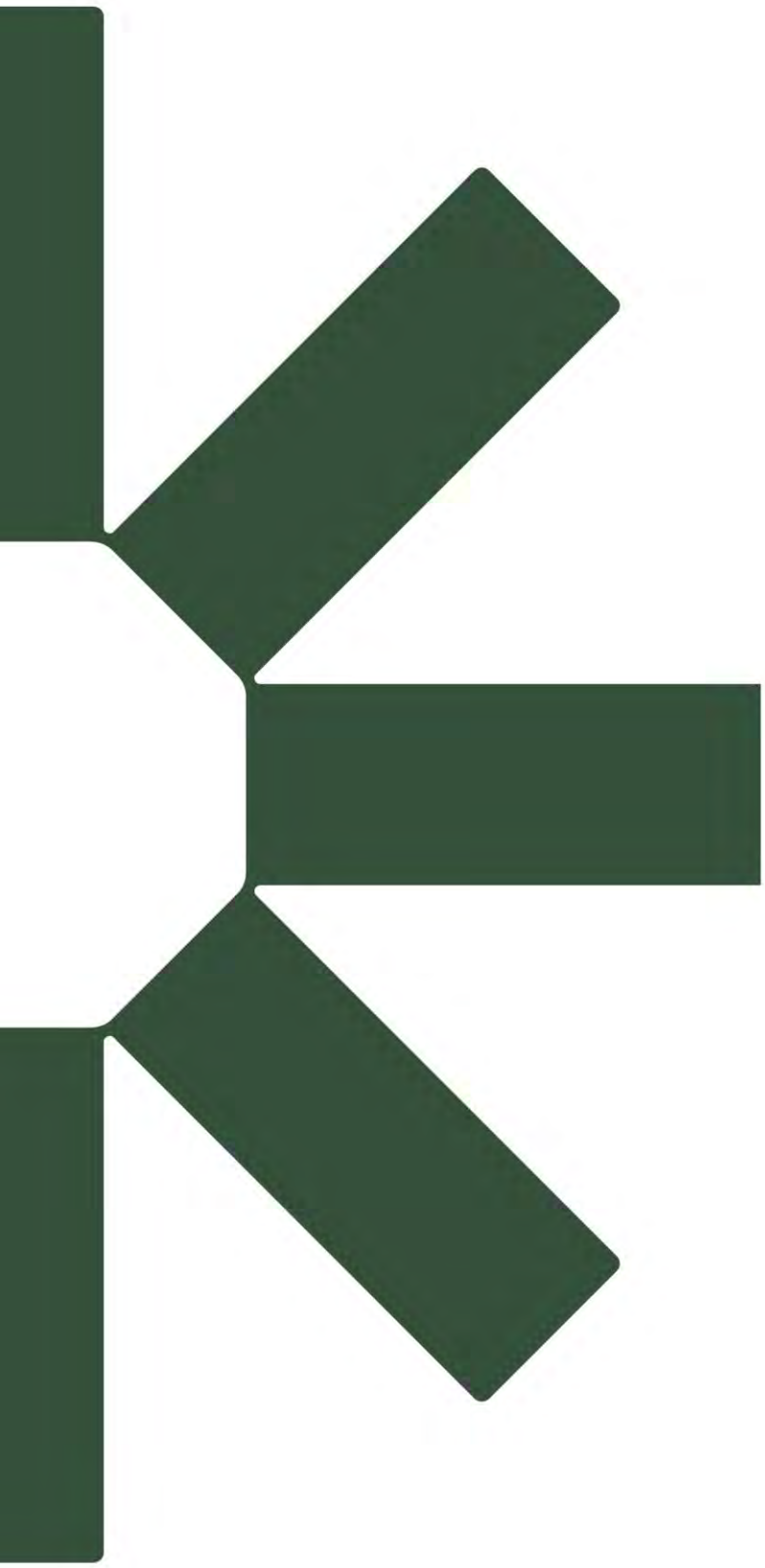
Designation Reference	SLR Number	HER Reference	Asset Name	Asset Type	Period	Source
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	SLR2	1066.02	Loch Walton	Bridge	Post-medieval	Stirling Council
	SLR3	2362.01	Cringate	Building	Post-medieval	Stirling Council
	SLR4	3377.01	Easter Cringate	Building	Post-medieval	Stirling Council
	SLR5	3377.02	Easter Cringate	Enclosure	Post-medieval	Stirling Council
	SLR6	3929.01	Buckie Burn	House	Post-medieval	Stirling Council
	SLR7	5424.00	Cringate	Sheepfold	Post-medieval	Stirling Council
	SLR8	5429.00	Endrick Water	Sheep Shelter	Post-medieval	Stirling Council
	SLR9	5520.00	Cringate	Track	Post-medieval	Stirling Council
	SLR10	5522.00	Earl's Burn	Track	Post-medieval	Stirling Council
	SLR11	5532.00	Randieford Bridge	Bridge	Post-medieval	Stirling Council
	SLR12	5911.00	Carron Valley	Water Meadow	Post-medieval	Stirling Council
SM4278	SLR13	587.00	Sir John De Graham's Castle	Motte	Medieval	Stirling Council
	SLR14	590.00	Todholes (Fintry)	Hut Circle	Prehistoric	Stirling Council
	SLR15	594.00	Todholes (Fintry)	Hut Circle	Prehistoric	Stirling Council
	SLR16	1933.00	Todholes (Fintry)	Hut Circle	Prehistoric	Stirling Council
	SLR17	3016.00	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR18	3016.01	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR19	3016.02	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR20	3016.03	Cringate Muir	Hut Circle	Prehistoric	Stirling Council

Designation Reference	SLR Number	HER Reference	Asset Name	Asset Type	Period	Source
	SLR21	3016.04	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR22	3016.05	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR23	3016.06	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR24	3016.07	Cringate Muir	Hut Circle	Prehistoric	Stirling Council
	SLR25	3016.08	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR26	3016.09	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR27	3016.10	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR28	3016.11	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR29	3016.12	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR30	3016.13	Easter Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR31	3016.14	Cringate	Hut Circle	Prehistoric	Stirling Council
	SLR32	3929.03	Buckieburn	Hut Circle	Prehistoric	Stirling Council
	SLR33	5422.00	Hart Hill	Quarry	Prehistoric	Stirling Council
	SLR34	5433.00	Todholes (Fintry)	Roundhouse	Prehistoric	Stirling Council
	SLR35	595.00	Todholes (Fintry)	Clearance Cairn	Undated	Stirling Council
	SLR36	596.00	Todholes (Fintry)	Clearance Cairn	Undated	Stirling Council
	SLR37	2275.00	Cringate Muir	Quarry Scoop	Undated	Stirling Council
	SLR38	2361.00	Earl's Burn	Enclosure	Undated	Stirling Council
	SLR39	3929.02	Buckie Burn	Boundary Marker	Undated	Stirling Council
	SLR40	5420.00	Hart Hill	Structure	Undated	Stirling Council
	SLR41	5421.00	Hart Hill	Quarry	Undated	Stirling Council
	SLR42	5423.00	Hart Hill	Structure	Undated	Stirling Council
	SLR43	5431.00	Todholes (Fintry)	Structure	Undated	Stirling Council
	SLR44	5434.00	Todholes (Fintry)	Structure	Undated	Stirling Council

Designation Reference	SLR Number	HER Reference	Asset Name	Asset Type	Period	Source
	SLR45	5435.00	Todholes (Fintry)	Cairn	Undated	Stirling Council
	SLR46	5436.01	Todholes (Fintry)	Wall	Undated	Stirling Council
	SLR47	5436.02	Todholes (Fintry)	Wall	Undated	Stirling Council
	SLR48	5437.00	Todholes (Fintry)	Clearance Cairn	Undated	Stirling Council
	SLR49	5438.01	Todholes (Fintry)	Clearance Cairn	Undated	Stirling Council
	SLR50	5438.02	Todholes (Fintry)	Clearance Cairn	Undated	Stirling Council
	SLR51	5438.03	Todholes (Fintry)	Structure	Undated	Stirling Council
	SLR52	5569.00	Earl's Burn	Structure	Undated	Stirling Council
	SLR53	5570.00	Earl's Burn	Cairn	Undated	Stirling Council
SM2492	SLR54	588.00	Todholes (Fintry)	Cairn	Prehistoric	Stirling Council
	SLR55	729.01	Kirk O' Muir	Burial Ground	Medieval	Stirling Council
	SLR56	729.02	Kirk O' Muir	Chapel	Medieval	Stirling Council
	SLR57	729.02	Kirk O' Muir	Chapel	Medieval	Stirling Council
	SLR58	732.00	Earl's Burn	Mound	Natural	Stirling Council
	SLR59	1528.00	Craigannet Hill	Church	Medieval	Stirling Council
	SLR60	1918.00	Boon A' Kirk	Farmstead	Post-medieval	Stirling Council
	SLR61	1918.00	Boon A' Kirk	Enclosure	Post-medieval	Stirling Council
	SLR62	2360.00	Earl's Burn	Kiln	Medieval to Post-medieval	Stirling Council
	SLR63	2360.01	Earl's Burn	Settlement	Medieval to Post-medieval	Stirling Council
	SLR64	2361.01	Earl's Burn	Building	Medieval to Post-medieval	Stirling Council
	SLR65	2362.02	Earl's Burn	Ree	Medieval to Post-medieval	Stirling Council
	SLR66	3371.00	Knowehead	Farmstead	Post-medieval	Stirling Council

Designation Reference	SLR Number	HER Reference	Asset Name	Asset Type	Period	Source
	SLR67	3372.00	Randieford Bridge	Farmstead	Post-medieval	Stirling Council
	SLR68	3375.00	Carron Valley Reservoir	Farmstead	Post-medieval	Stirling Council
	SLR69	5428.01	Cringate	Farmstead	Medieval to Post-medieval	Stirling Council
	SLR70	5428.02	Cringate	Field System	Medieval to Post-medieval	Stirling Council
	SLR71	5432.00	Todholes (Fintry)	Lazy Beds	Post-medieval	Stirling Council
	SLR72	5521.00	Cringate	Rig Cultivation	Medieval to Post-medieval	Stirling Council
	SLR73	5523.00	Earl's Burn	Building Platform	Medieval to Post-medieval	Stirling Council
	SLR74	5524.00	Earl's Burn	Field Bank	Medieval to Post-medieval	Stirling Council
	SLR75	5571.00	Cringate	Rig Cultivation	Medieval to Post-medieval	Stirling Council
	SLR76	5572.00	Cringate	Dyke	Medieval to Post-medieval	Stirling Council
	SLR77	5684.00	Todholes (Fintry)	Clearance Cairn	Medieval to Post-medieval	Stirling Council
	SLR78	5719.00	Craigengelt	Shieling-Hut	Medieval to Post-medieval	Stirling Council
	SLR79	6978.00	Craigannet Hill	Building	Post-medieval	Stirling Council
	SLR80	6980.00	Craigannet Hill	Burnt Mound	Prehistoric	Stirling Council
	SLR100	N/A	Carron Valley Reservoir	Reservoir	Modern	Aerial Photography
	SLR101	N/A	N/A	Sheep Ree	Post-medieval	Six-inch 1st edition Ordnance Survey map, Stirlingshire Sheet XXII, published 1864

Designation Reference	SLR Number	HER Reference	Asset Name	Asset Type	Period	Source
	SLR102	N/A	N/A	Enclosure	Post-medieval	Six-inch 2nd edition Ordnance Survey map, Stirlingshire Sheet XXII.SE, published 1899
	SLR103	N/A	N/A	Sheepfold	Post-medieval	Six-inch later edition Ordnance Survey Map, Stirlingshire Sheet nXXII, published 1922
	SLR104	N/A	N/A	Old Sheepfold	Post-medieval	Six-inch later edition Ordnance Survey Map, Stirlingshire Sheet nXXII, published 1922
	SLR105	N/A	N/A	Old Sheepfold	Post-medieval	Six-inch later edition Ordnance Survey Map, Stirlingshire Sheet nXXII, published 1922
	SLR106	N/A	N/A	Ruined Wall	Undated	Walkover Survey
	SLR107	N/A	N/A	Ruined Wall	Undated	Walkover Survey
	SLR108	N/A	N/A	Ruined Wall	Post-medieval	Walkover Survey



Making Sustainability Happen

Technical Appendix 11.2: Cultural Heritage Appraisal Table

Cairnoch Hill Wind Farm

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SLR Project No.: 428.V12085.00001

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Revision: 01

Table 1: World Heritage Site

Asset Title	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind turbine	Appraisal
Antonine Wall – Frontiers of the Roman Empire World Heritage Site	0-1 within 10km of wind turbines	8km	South	The closest point of the Antonine Wall, which forms part of the Frontiers of the Roman Empire World Heritage Site, is located approximately 8km south of the Proposed Development, at Bar Hill SM9908. The Antonine Wall is the remnants of the most northerly frontier of the Roman Empire, comprising a turf rampart and an associated ditch to the north that ran for approximately 60km from modern Bo'ness in the east of Scotland to Old Kilpatrick in the west. The Antonine Wall is also made up of several Scheduled Monuments. Within 10km of the proposed wind turbines, the following Scheduled Monuments are associated with the Antonine Wall: • **SM727** Antonine Wall, 855m WSW to 605m ENE of Wester Shirva • **SM7528** Antonine Wall, Girnal Hill to B802 road, Croy • **SM7680** Antonine Wall, Wester Dullatur to East Dullatur • **SM7457** Bar Hill, Roman temporary camp SW of • **SM90008** Antonine Wall, Bar Hill, rampart, ditch, fort and Military Way • **SM90011** Antonine Wall, camp, fortlet, fort and settlement, Croy Hill • **SM7052** Antonine Wall, N of Alexander Avenue, Twechar • **SM7054** Antonine Wall, Twechar Main Street to Bar Hill • **SM7074** Antonine Wall, E edge of Strone Plantation to Girnal Hill • **SM7639** Antonine Wall, B802 to N of Cuilmuir View, Croy • **SM90017** Antonine Wall and fort, railway line to 300m E of Westerwood steading • **SM90015** Antonine Wall, N of Cumbernauld airfield to Wyndford Road The *Frontiers of the Roman Empire (Antonine Wall) World Heritage Site: Supplementary Planning Guidance* identifies that the Antonine Wall was deliberately constructed using the landscape, topography and resources of central Scotland to inform its placement. The wall sits along the southern border of the valley formed by the River Kelvin at the south and the River Carron at the

				north. The Kilsyth Hills, Campsie Fells and Kilpatrick Hills are all situated to the north of the wall. The valley and the hills are key parts of the landscape which the various forts and outposts along the wall were designed to monitor. As the landscape to the south of the wall was already under Roman control during this period, it is the land to the north and those approaching the wall from the north that were the cause of the most concern. The wall is also situated along higher ground to the south of the valley, insinuating that it was meant to be visible within the landscape when approaching the wall, especially from the north. The Proposed Development sits to the north of the Kilsyth Hills and is situated along the northern bank of the Carron Valley Reservoir and the River Carron. This area forms the northern border of the valley monitored by the Antonine Wall. The Proposed Development sits within a dip in the landscape, which obscures it from view from the majority of the World Heritage Site and associated Scheduled Monuments within the 10km study area. As such, for the majority of the associated assets within the study area, there is no potential for the Proposed Development to form a backdrop to any key views over the valley. The ZTV indicates that there would be the potential for visibility of a single wind turbine tip in the south east of the study area, overlapping with sections **SM90015** and **SM90017** of the wall. Whilst the single wind turbine tip may appear in views towards the Carron River from the wall and the associated Scheduled Monuments, its orientation to the north west and distance of 10km from the asset means that its presence within any views would be minimal at most. A singular wind turbine would be indiscernible against the skyline, due to the surrounding built environment and topography. The single wind turbine blade tip would not impact the ability to understand, appreciate or experience Scheduled Monuments **SM90015** and **SM90017** nor impact the Outstanding Universal Value of the World Heritage Site. Therefore, the Antonine Wall (Frontiers of the Roman Empire World Heritage Site) and all associated Scheduled Monuments within the 10km study area are scoped out of further assessment.

Table 2: Scheduled Monuments

Designation Reference	Designation Title	Category	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind Turbine	Appraisal
SM7016	Murrayshall Farm, dun 200m SE of	Prehistoric domestic and defensive: dun	0	8.1	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM7017	Castlehill, hut circle 350m S of	Prehistoric domestic and defensive: house	0	7.7	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM6553	Dundaff Hill, mound 550m NE of summit	Prehistoric ritual and funerary: mound (ritual or funerary rather than defensive or domestic)	4	3.2	West	This asset has been scoped in for further assessment.
SM7131	Dundaff Hill, enclosure 950m NNW of Carron Bridge	Prehistoric ritual and funerary: bell cairn	1	3.2	North west	This asset comprises the remains of a ceremonial enclosure or burial cairn suggested to be of a Neolithic or Bronze Age date. It lies on the south-east slope of Dundaff Hill, near the summit at around 325m AOD, overlooking the River Carron and Faughlin Burn to the south. The asset mainly derives its significance from its archaeological potential, with its unusual use of a natural bedrock outcrop to form the central mound suggesting inhumation was not the primary function, but rather that ritual activities may have formed its main purpose.

						The asset's location near the summit of Dundaff Hill contributes to its significance of setting, as it allows wide-ranging views to and from the south and south-east focused along the Carron River valley and towards the Faughlin burn. A second asset, likely contemporary, lies approximately 600m to the north-east (**SM6553**), suggesting the surrounding area forms part of a wider burial or ceremonial landscape, contributing to its setting. One wind turbine of the Proposed Development is predicted to be visible from the asset to the north west. This wind turbine would be peripheral in views between this asset and **SM6553** and would form a minor distraction at most. The wind turbine would not feature in views from the asset towards the watercourses to the south and south-east, and as such would not impact the ability to understand, appreciate or experience the asset. It is therefore scoped out of further assessment.
SM7009	Dasher, fort 600m ENE of	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	0	8.2	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM7010	Carleatheran, cairn at summit, Gargunnock Hills	Prehistoric ritual and funerary: cairn (type uncertain)	4	5.5	South	This asset consists of the remain of a burial cairn likely dating to the Bronze Age. The asset is located in rough pastureland at the summit of Carleatheran, a hill approximately 485m AOD, the remains of the cairn measure about 18m in diameter and approximately 1.7m high. Large stones on the eastern and southern sides seem to indicate the remains of a kerb. The asset's position, at a high point on a ridge within the Gargunnock Hills, offers expansive long-distance views of the surrounding landscape in every direction. To the south, it overlooks an undulating upland plateau, while to the north, it provides a view of the broad Upper Forth valley. The asset stands as a prominent feature in the landscape, allowing views to and from the surrounding area, particularly in

						approaches along the Upper Forth Valley, which is highly significant to its setting. There are two other cairns located along the ridge to the west: Stronend, cairn at summit, Gargunnock Hills (**SM7005**), and Stronend, cairn 300m SSW of summit, Gargunnock Hills (**SM7030**), both of which are likely contemporary burial cairns, and share intervisibility, suggest a connection and relationship that contributes to the overall setting of all three assets. This open and rural environment contributes to the asset's setting, allowing for the continued appreciation of its presence from various viewpoints. Wind turbines would not be present in views to the north from the asset nor in views from Upper Forth Valley when approaching the asset. Four wind turbines of the Proposed Development are predicted to be visible towards the south of the asset. Views of the wind turbines would be in the extreme periphery of views towards **SM7005** and **SM7030** to the west, and as such would not be considered to impact on the ability to understand or appreciate the relationship between these assets. Though views south from the asset are also considered to be a factor in its significance, the land to the south of the asset is now occupied by 12 modern wind turbines, belonging to the Earlsburn wind farm. These wind turbines, as part of the assets baseline, have impacted the ability to appreciate and understand its association with its setting to the south. Whilst the four wind turbines from the Proposed Development would be present in views behind the pre-existing wind turbines, their presence in the landscape is not anticipated to further erode the ability to understand this part of the assets setting and as such their impact would be negligible. The Proposed Development would therefore not impact on the ability to understand, experience or appreciate the asset, and this asset has therefore been excluded from further assessment.
SM7005	Stronend, cairn at summit, Gargunnock Hills	Prehistoric ritual and funerary: cairn	4	7.0	South east	This asset consists of the remains of a burial cairn approximately 14m in diameter and 1m in height, likely Bronze Age in date, which lies in rough pasture on the summit of Stronend hill, at

		(type uncertain)				around 510m AOD. The asset's location, perched high on a ridge on the western edge of the Gargunnock Hills, with steep drops to the north and west, affords long-ranging views of the surrounding landscape in all directions, overlooking the Endrick Water to the south-west and south. To the east the landscape slopes down gradually towards the valley of the Boquhan Burn. The asset is surrounded by rolling moorland covered in heather. This open, rural landscape enhances the asset's setting, enabling its appreciation from multiple viewpoints. As a prominent landmark in the area, it is highly visible and integral to the character of its setting, offering and receiving views from the surrounding landscape. A second, likely contemporary cairn (**SM7030**) lies approximately 0.27km to the south-west of the asset, and a third cairn located approximately 6.4km to the north-east share intervisibility with one another and as such, share a connection and relationship that contributes to the overall setting of all three assets in a prehistoric funerary and ritual landscape. he bare-earth ZTV predicts that up to four wind turbines of the Proposed Development in views from the asset to the south. As outward views which contribute to the asset's significance and form part of its setting are focused over the open landscape to the west and south west, visibility of the wind turbines in this direction are unlikely to form more than a minor distraction to the ability to appreciate the outward views that form the asset's setting. Four wind turbines would be visible in views from **SM7010** and **SM7005** towards this asset, however, the wind turbines would be only a minor distraction in peripheral views. Due to the positioning of the wind turbines in a roughly linear shape from north-west to south-east visibility of the wind turbines would not be considered to be a distraction to the extent that they would impact the ability to understand or appreciate the relationship between these assets. The Proposed Development would not affect the ability to appreciate, understand or experience the asset and it has therefore been scoped out of further assessment.

SM7075	Twechar, Roman temporary camp NW of St John of the Cross RC Church	Roman: Antonine Wall; camp	0	9.9	South	This asset has been assessed as part of the Antonine Wall World Heritage Site.
SM7030	Stronend, cairn 300m SSW of summit, Gargunnock Hills	Prehistoric ritual and funerary: cairn (type uncertain)	4	6.9	South east	This asset comprises the remains of a prehistoric burial cairn approximately about 6.0m in diameter and 0.6m high. It is situated just to the south-west of the summit of Stronend hill at around 480m AOD, in rough pasture. Positioned high on a ridge on the western edge of the Gargunnock Hills, it sits above steep drops to the north and west, providing expansive views of the surrounding landscape. The cairn overlooks the Endrick Water to the south west and south, while the landscape gradually slopes down towards the valley of the Boquhan Burn to the east. Surrounded by rolling moorland covered in heather, the surrounding open, rural landscape enhances the cairn's setting, allowing it to be appreciated from multiple viewpoints. As a prominent landmark in the area, it is highly visible and integral to the character of its surroundings, both offering and receiving views from the landscape. A second, likely contemporary cairn (SM7005) lies approximately 0.27km to the north-east, on the summit of the hill, with a third cairn (**SM7010**) located approximately 6.5km to the north east. These asset may be contemporary and share intervisibility with one another. This relationship contributes to the overall setting of all three cairns in a prehistoric funerary and ritual landscape. The bare-earth ZTV predicts that up to four wind turbines of the Proposed Development in views from the asset to the south. Four wind turbines would be visible in views from **SM7010** and **SM7005** towards this asset, however, the wind turbines would be a minor distraction in peripheral views. Due to the positioning of the wind turbines in a roughly linear shape from north-west to south-east and would not be considered to be a distraction to the extent that they would impact the ability to understand or appreciate the relationship between these assets. Key views from the asset in all directions would remain intact. The Proposed Development would therefore not affect the ability to

						appreciate, understand, or experience the cairn, and it has therefore been excluded from further assessment
SM7085	Fintry Castle, remains of	Secular: castle	4	5.0	East	This asset comprises the remains of Fintry Castle and its outbuildings, suggested to originate from the 15th-16th century. The asset lies in rough pastureland around 180m AOD, overlooking the Endrick Water as it runs westward towards Loch Lomond, and the Tochan Burn as it flows south to north into the Endrick Water. The remains of the castle, surviving primarily as a mound of rubble, suggest it took an oblong shape, standing around 20m east to west, with a possible tower standing at the western end, suggest views towards the west were of particular importance in its construction. The main aspect of its setting that contributes to its significance is its location on a slope above the watercourse, which would have allowed it inhabitants to monitor and control travel along the river and its valley to the east and west. This positioning would have allowed it defensive control of the river and its valley, with its placement on a slope further strengthening its fortification against any possible attacks. The asset also sits within a wider defensive landscape, with a number of earlier assets of a similar nature overlooking the same section of the valley, further suggesting that control over the watercourse and its valley were an important factor in the construction of this asset. In particular this asset may share intervisibility with **SM2229,** a motte of a possibly contemporary date, located approximately 2.8km to the west, on the other side of the Endrick Water. The relationship between these assets may have contributed to its defensive setting, either monitoring and controlling the watercourse and its valley together or against one another. The bare earth ZTV predicts four wind turbines of the Proposed Development are predicted to be visible to east of the asset. Though views in this direction form part of the asset's setting, as they would be present in views over the watercourse, they would form a minor distraction at most due to their distance and relatively linear layout. They would also form a minor distraction in

						peripheral views to the south over the Tochan Burn. All other aspects of the asset's setting would remain intact, with views to the west remaining uninterrupted, as well as views towards **SM2229**. The presence of a small number of wind turbines in long distance views would be a minor distraction at most from its original setting and would not affect the ability to appreciate, understand or experience the asset. It has therefore been scoped out of further assessment
SM6766	Forth and Clyde Canal: Auchinstarry Farm - Castlecary	Industrial: bridge, viaduct, aqueduct; inland water	0	8.7	North	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM6769	Forth and Clyde Canal: Kirkintilloch - Auchinstarry Farm	Industrial: bridge, viaduct, aqueduct; inland water	0	9.1	North	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM727	Antonine Wall, 855m WSW to 605m ENE of Wester Shirva	Roman: Antonine Wall	0	9.8	North	Assessed as part of Antonine Wall World Heritage Site
SM2381	Myot Hill, fort	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	3	7.9	North west	This asset comprises the remains of an Iron Age hill fort, located on an easily defendable hill with steep slopes in all directions. From its raised position, the asset overlooks the Garvald Burn to the north, the River Carron to the north-east and the Castlerankine Burn to the south. This elevated position would have afforded its inhabitants wide ranging views over the landscape in all directions, allowing them to control and monitor travel along the watercourses and approaches, with these extensive views forming the core of its setting. Views to the north east are likely to have been of key importance in particular, as they would have provided views over the main watercourse, the River Carron, as well over the lower-lying land that lies past it. The landscape to the south, south-east and south-west is similarly low-lying, allowing for particularly long-distance views.

						The hills present to the west and north-west of the asset would have blocked views in this direction to some extent and form a visual boundary to the assets setting. The ZTV predicts that there would be visibility of three wind turbines in the backdrop of the hills to the north west of the asset. The presence of three wind turbines in long- is likely to form a minor distraction at most in views in this direction and would not affect the original setting of the asset, as the key views in other directions would be preserved. The original setting of the asset has already been significantly eroded by the construction of two radio buildings and a mast on the same hill. These modern buildings impact the ability to appreciate, experience and understand the asset to such an extent that visibility of a single wind turbine approximately 7.9km to the north-west would not be considered to form any level of distraction in views. As such the Proposed Development would not cause any further impact on the ability to appreciate, understand and experience this asset. This asset has therefore been scoped out of further assessment.
SM2572	Craigstone Wood, Castle Hill, motte E of	Secular: motte	0	7.7	North	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM2566	Gillies Hill, fort	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	3	8.9	South west	This asset comprises the remains of an Iron Age hill fort, located on a triangular promontory formed where a gully divides the cliffs on the western flank of Gillies Hill. Its defence comprises of three ramparts which curve east from the northern edge of the fort before running south to where the gully cuts into the cliff. On the east the cliff forms a natural defence, as well as providing wide-ranging views over the landscape to the north and west, with views to the south partially obscured by a high point on the other side of the gully. The positioning of the asset overlooking the cliffs to the west would have allowed its inhabitants to control and monitor travel through the valley below the cliffs, through which an unnamed

						tributary of the River Forth runs. This valley runs from south to north, where it widens and joins the Forth Valley. Views over the valley immediately west of the asset, and those over the Forth Valley are likely highly significant to the setting of the asset, as they would have been utilised for defensive purposes by the inhabitants of the fort. Wide ranging views over the landscape would also have been key to its significance of setting for the same reason. Though three of the wind turbines of the Proposed Development are currently predicted to be visible from the asset, their distance of approximately 9.1km away means that they would not feature prominently in views towards the south-west and would present a minor distraction at most in wide-ranging views over the landscape from the asset. The Proposed Development is therefore not predicted to impact the ability to understand, experience or appreciate the asset, and it has therefore been scoped out of further assessment.
SM2561	Keir Knowe, motte 460m W of Easter Glinns	Secular: motte	0	7.0	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM3395	Glenhead, cultivation terraces SE of	Prehistoric domestic and defensive: cultivation terraces		5.5	West	This asset comprises the remains of a group of likely medieval cultivation terraces lying on the south western slope of a hill, overlooking the Buckie Burn to the west and the River Carron to the south. The terraces are located at the confluence of these watercourses, following the Buckie Burn as it runs south into the River Carron as it flows to the east. The primary aspect of the asset's setting which contributes to its significance is its placement within arable land, as this would have allowed for the cultivation of crops upon the terraces. The two watercourses it follows form a secondary aspect of the asset's setting, as the fresh water would have been utilised for agricultural purposes. As the asset is agricultural in nature, long ranging views are unlikely to contribute to its setting, the predicted visibility of four wind turbines to the west of the asset would not

						impact the ability to appreciate, experience or understand the asset. It is therefore scoped out of further assessment.
SM5681	Dunbeg, fort 700m W of Fintry Bridge	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	4	8.3	East	This asset comprises the remains of a fort of uncertain prehistoric date. It lies on an isolated rocky knoll on a north/north-east facing slope overlooking the Endrick Water, which lies approximately 0.5km to the north-east of the asset. The primary aspect of its setting that contributes to its cultural significance is its elevated position in the landscape, which would have provided its inhabitants with wide-ranging views over the Endrick Water. These views would have allowed its inhabitants to control and monitor movement through the valley and along the river from a defensive position. Though four wind turbines of the Proposed Development would be visible in views from the asset to the east, along the valley of the Endrick Water, the distance between the asset and the Proposed Development (approximately 7.8km) means that the Proposed Development would not feature prominently in the landscape and as such would not a form a major distraction in views in this direction. Another key aspect of this asset's setting is the approach to the fort, which is suggested to be from the south-west, and along the river itself. The ZTV indicates that there would be no visibility of the proposed wind turbines when approaching along the river, and very limited views, if any, when approaching from the south west. The Proposed Development would therefore not affect the ability to understand, appreciate or experience the asset and the asset is therefore scoped out of further assessment.
SM2547	Brokencastle, dun 600m NE of Dasher	Prehistoric domestic and defensive: dun	0	8.5	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

SM2554	Leckie Burn, bridge 230m WSW of Watson House	Secular: bridge	0	8.1	South	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM2719	Waterhead, two standing stones 800m ENE of	Prehistoric ritual and funerary: standing stone	4	4.3	North east	This asset has been scoped in for further assessment
SM2229	Fintry, motte 400m WSW of Fintry Bridge	Secular: motte	4	8.0	South east	This asset consists of the remnants of a motte dated to the medieval period. It is situated on an isolated rocky knoll on a north/north-east facing slope, overlooking the Endrick Water approximately 0.5 km to the north-east. The fort's elevated position and proximity to Endrick Water are key aspects of its setting contributing to its significance. This elevation would have provided its inhabitants with extensive views over the Endrick Water, enabling them to control and monitor movement through the valley and along the river from a defensive standpoint, particularly where it widens towards the north west. The asset may also share intervisibility with a possibly contemporary asset, **SM7085**, which lies on the other side of the Endrick Water, approximately 3km to the south-east, as well as a dun, **SM2556** on the slopes of the Gargunnock Hills, approximately 1.7km to the north east. While four wind turbines from the Proposed Development would be visible to the east, along the Endrick Water valley, the distance of about 7.8 km between the fort and the Proposed Development means the wind turbines would not be prominent in the landscape. This would form a minor distraction at most in views along the watercourse and in the backdrop of intervisibility between this asset and **SM7085**. The wind turbines would be present to a very minor extent in views towards **SM2556** but would not be considered to form a distraction given they would be in peripheral views only. All other aspects of the asset's setting would remain intact, including key views towards the valley towards the north-west. Consequently, they would not detract

						from the views or the ability to understand, appreciate, or experience the fort. Therefore, the asset has been excluded from further assessment.
SM2556	Craigton, dun 460m N of	Prehistoric domestic and defensive: dun	0	6.4	South east	This asset comprises the remains of a dun, located on the south western slope of the Gargunnock Hills at around 260m AOD. It overlooks the Endrick Water and its valley, with the river running approximately 0.7km to its south. Its positioning over the watercourse provides it with excellent long-distance views up the river towards the west and north-west, as well as across the valley to the south and south-west. The asset sits within a wider archaeological landscape of defensive structures, which lie on the other side of the watercourse, including a motte (**SM2229**) approximately 1.7km to the south-west, and two forts (**SM5681** and **SM2575**) approximately 2km and 2.2km to the south-west respectively. Though many of these assets lack a definitive date, their placement within the same area and their similar purpose suggests that this watercourse and its valley remained an important routeway to monitor and control travel along for an extensive period from prehistory to the medieval era. These assets may have therefore shared a spatial and temporal relationships, either working together or against one another to control passage along the Endrick Water and its valley. Control of the valley and the ability to monitor approach and travel along the watercourses therefore forms the primary aspect of this asset's setting, with the possible relationship between the other assets being of secondary importance. No wind turbines are currently predicted to be visible from the asset in views in any direction, including towards the other defensive assets that may contribute to its setting. Up to four wind turbines of the Proposed Development are predicted to be present in peripheral views from **SM2229, SM5681** and **SM2575** towards this asset. The presence of a small number of wind turbines in peripheral views towards the asset would not impact on the ability to understand, appreciate or experience the

						relationship between these assets, and as such the setting would remain intact. The Proposed Development is therefore not predicted to impact the ability to understand, appreciate or experience the original setting of this asset and it is therefore scoped out of further assessment.
SM2575	Dunmore, fort	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	4	8.6	East	This asset consists of the remnants of a fort, likely to be of prehistoric to early-medieval origin. It is situated at the peak of the Campsie Fells at a height of approximately 340 AOD. The entrance to the fort is suggested to be from the north, with a possible second entrance to the south. The asset's elevated and prominent position in the landscape is a primary aspect of its setting, contributing to its significance. This elevation would have provided its inhabitants with extensive views over the Endrick Water, enabling them to control and monitor movement through the valley and along the river from a defensive standpoint, as well as allowing those travelling along the valley to see the fort upon their approach. Another important aspect of the asset's setting is the approach from the south-west, which offers additional views across the river valley. There are also a number of assets of a similar defensive nature within close proximity of this asset, namely **SM2229, SM5681** and **SM2556. SM2229** and **SM5681** both lie lower on the slope of the same hill as this asset, approximately 0.49km and approximately 0.16km to the north-east respectively, whilst **SM2556** lies on a slope on the other side of the Endrick Water, approximately 2.2km to the north-east. Despite the lack of definitive dates for many of these assets, their location within the same area and similar purposes suggest that this watercourse and its valley remained a significant routeway for monitoring and controlling travel from prehistory through the medieval era. Consequently, these assets likely shared both spatial and temporal relationships, potentially cooperating or competing to control passage along the Endrick Water and its valley.

						While four wind turbines from the Proposed Development would be visible to the east, along the Endrick Water valley, the distance between the asset and the Proposed Development means the wind turbines would not be prominent in the landscape and would therefore form a minor distraction at most in views along the watercourse and its valley in this direction. They would also be present to a minor extent in views between this asset and the assets of a similar nature noted above. As the wind turbines would only be present in peripheral views between the assets, they would not impact the ability to understand, appreciate and experience the relationship between the assets and the setting of their relationship would therefore remain intact. Consequently, they would not significantly detract from the primary views that contribute to the significance of the asset's setting or the ability to understand, appreciate, or experience the asset. Therefore, the asset has been excluded from further assessment.
SM2696	Knochraich, standing stone 340m NW of	Prehistoric ritual and funerary: standing stone	0	8.4	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM2492	Todholes, cairn 1000m NNE of	Prehistoric ritual and funerary: cairn (type uncertain)	4	1.5	South east	This asset has been scoped in for further assessment
SM2573	Keir Hill of Dasher, earthwork	Secular: enclosure	0	9.5	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM3680	Wallstale, limekilns 100m W of	Industrial: kiln, furnace, oven	1	8.6	South west	This asset is comprised of the remains of a range of three 3-draw limekilns of 19th century date. It is situated in a bankside position,

						intended to allow for ease of loading at the kiln head. As a functional asset, the primary aspect of its setting which contributes to its cultural heritage significance is its placement in close proximity to source of limestone and the surrounding agricultural lands, for which it would have provided fertiliser in the form of quicklime. As such the contributing elements of its setting are entirely localised, which long distance views not forming part of its functional setting. Though one wind turbine is predicted to be visible from the north western most section of the scheduled area, views of one wind turbine in long distance views towards the south west would not impact upon the ability to appreciate, understand or experience the asset and its functional setting. It is therefore scoped out of further assessment.
SM4117	Hollandbush,limekilns 100m W of	Industrial: kiln, furnace, oven	0	9.9	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM4599	Woodside, homestead 600m SSW of	Prehistoric domestic and defensive: homestead	0	7.4	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM3394	Harvieston, deserted village E of	Secular: settlement, including deserted and depopulated and township	0	9.5	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM4278	Sir John de Graham's Castle	Secular: castle	4	1.1	North east	This asset has been scoped in for further assessment.
SM4491	Todholes, cairn 1300m NNW of	Prehistoric ritual and	4	1.9	South east	This asset has been scoped in for further assessment.

		funerary: ring cairn				
SM7528	Antonine Wall, Girnal Hill to B802 road, Croy	Roman: Antonine Wall	0	9.2	North west	Assessed as part of Antonine Wall World Heritage Site
SM7680	Antonine Wall, Wester Dullatur to East Dullatur	Roman: Antonine Wall	0	9.0	North west	Assessed as part of Antonine Wall World Heritage Site
SM7457	Bar Hill, Roman temporary camp SW of	Roman: Antonine Wall; camp	0	9.6	North	Assessed as part of Antonine Wall World Heritage Site
SM90008	Antonine Wall, Bar Hill, rampart, ditch, fort and Military Way	Roman: Antonine Wall	0	9.3	North	Assessed as part of Antonine Wall World Heritage Site
SM90011	Antonine Wall, Roman: Antonine Wall; bathhouse; civil settlement; fort; fortlet; military way camp, fortlet, fort and settlement, Croy Hill	Roman: Antonine Wall; bathhouse; civil settlement; fort; fortlet; military way	0	9.2	North west	Assessed as part of Antonine Wall World Heritage Site
SM2579	Easter Auchincloch, fort 180m NNE of	Prehistoric domestic and defensive: cave	0	8.9	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM456	Braes, fort 130m WNW of	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	0	9.1	West	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

SM177	Castlehill Wood, dun 780m S of Touch Mollar	Prehistoric domestic and defensive: dun	2	7.2	South west	This asset consists of a prehistoric dun located on a north-east facing slope. The positioning of the asset, facing north east, would have allowed its inhabitants to control and monitor travel through the valley to the east. This valley, through which an unnamed tributary of the River Forth runs, extends from south to north, eventually widening and joining the Forth Valley. Views over the valley immediately east of the asset, along with those over the Forth Valley, are likely highly significant to the setting of the asset, as they would have been utilised for defensive purposes by the inhabitants of the fort. Wide-ranging views over the landscape would also have been key to its significance of setting for the same reason. There are also a number of assets of a similar function and which may have been in use at the same time, namely **SM2566**, a fort which lies on a steep slope the other side of the valley approximately 2km to the north-east, as well as three further duns (**SM2121, SM7016** and **SM2110**) which lie 1.7km, 1.5km and 2.4km to the east of this asset respectively. These assets may have therefore shared a spatial and temporal relationships, either working together or against one another to control passage along the valley. The ability to monitor and control approach and travel along the valley therefore forms the primary aspect of this asset's setting, with the possible relationship between the other assets being of secondary importance. Two wind turbines of the Proposed Development are currently predicted to be visible from the asset to the south-west. Visibility of this wind turbine would not be present in key views from the asset over the valley which forms the key part of its setting, nor in views to and from this asset and the other duns, which would remain intact. The wind turbine may feature in the backdrop of views from **SM2566**, but due to the distance between the assets and the Proposed Development, it would not feature prominently in the landscape and would form a minor distraction at most in long distance views. As such the Proposed Development would not be considered to impede the ability to appreciate, understand or experience the asset and it is therefore scoped out of further assessment.

SM608	Double Craigs, hut circle	Prehistoric domestic and defensive: hut circle, roundhouse	4	5.9	South east	This asset is comprised of the remains of a singular hut-circle. The asset lies near the summit of the Gargunnock Hills, atop a steep south west facing slope above the River Carron and its valley. This positioning would have allowed its inhabitants wide ranging views over the lower-lying land to the south west, as well as along the watercourse in both directions. The aspects of this asset's setting from which it derives its significance are related to the use of the surrounding land for agricultural practices and defensive positioning. The south facing land near water may have been useful for agricultural purposes and provided fertile ground. The asset also lies in close proximity to the River Carron, approximately 1km to the south west, which would have provided the inhabitants with a source of water, as well as with views over this watercourse as it flows from west to east. These views contribute to the asset's setting, as they would have allowed the inhabitants to control access to and monitor any approaching travel via the watercourse. The steep slope would have provided a natural form of defence. Whilst there would be visibility of four wind turbines according to the ZTV, they are not predicted to impact the understanding of its relationship to the immediate rural and agricultural setting or be present in views to the south west along the watercourse and its valley. The wind turbines are not anticipated to be present in views when approaching the asset along the valley. The wind turbines would be present in views directly to the east; however, this view does not include the valley or river and is not a key part of the assets setting. Visibility of the wind turbines would therefore not detract from the ability to appreciate, understand or experience the asset. Thus, the asset is excluded from further assessment.
SM2110	Wallstale, dun	Prehistoric domestic and defensive: dun	1	8.8	South west	This asset is comprised of a dun, likely of Iron Age date, situated on a south-west facing sloped overlooking the Bannockburn and its valley. A second dun, **SM2121**, is located on the opposite slope, approximately 0.65km to the south west.

						The asset's elevated position within the landscape would have afforded long-distance views to the west, north-west and east, enabling its inhabitants to observe and exert control over the surrounding terrain, particularly movement and approaches along the watercourse. Intervisibility with **SM2121** would have allowed this control to extend to views in the opposite direction, further increasing control of passage through the valleys. These qualities form a key aspect of the asset's setting which contributes to its cultural heritage significance. One wind turbine is predicted to be visible from the asset towards the south-west. As such, the Proposed Development may appear in the backdrop of views from the asset when looking towards **SM2121.** However, views in this direction are unlikely to have been intended to range beyond **SM2121,** and given the visual prominence the dun would have had, visibility of a single wind turbine in the distant backdrop would not be considered to form a distraction from the ability to appreciate or understand their relationship or their shared control over the Bannockburn and its valley. Neither would this visibility interfere with the ability to appreciate the long distance views from the asset along the Bannockburn to the west, forming a minor distraction in these views at most. Views which contribute to the setting of the asset in all other direction would remain intact. As such, the ability to appreciate, understand and experience the asset would remain intact and it has been scoped out of further assessment for this reason.
SM2120	Sauchie Craig, fort, North Third Reservoir	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort	4	6.8	South west	This asset comprises a prehistoric fort situation above a steep slope on a north western facing edge of the Sauchie Craigs, at approximately 220m AOD. Though the North Third Reservoir now lies approximately 0.2km to the west of the asset, this reservoir was constructed in 1911 and the asset's original setting would have been overlooking the Bannockburn. Its elevated position in the landscape would have provided it with extensive views to the west and north-west, allowing its inhabitants to monitor and control the landscape in these directions, and travel and approach

						along the watercourse in particular, forming the core of the assets setting. Four wind turbines are currently predicted to be visible from the asset towards the south-west. The asset's positioning on the north-western facing edge of the Sauchie Craigs suggests that the focus of this asset was towards the north-west, with long distance views over the Bannockburn and the surrounding valley in this direction being of key importance. The Proposed Development would not be present in views in this direction, and despite the construction of the reservoir, the original setting of the asset could therefore still be appreciated. Though the wind turbines would be present in views over the wider landscape towards the south-west, these views are likely of minor importance, and the distance of approximately 7.0km between the Proposed Development and the asset indicate that the wind turbines would not feature prominently in the backdrop of the landscape and would form a minor distraction at most. The ability to appreciate, understand and experience the asset would therefore remain intact and it has been scoped out of further assessment for this reason.
SM7052	Antonine Wall, N of Alexander Avenue, Twechar	Roman: Antonine Wall	0	9.7	North	Assessed as part of Antonine Wall World Heritage Site
SM7054	Antonine Wall, Twechar Main Street to Bar Hill	Roman: Antonine Wall	0	9.4	North	Assessed as part of Antonine Wall World Heritage Site
SM7074	Antonine Wall, E edge of Strone Plantation to Girnal Hill	Roman: Antonine Wall	0	9.2	North	Assessed as part of Antonine Wall World Heritage Site
SM7639	Antonine Wall, B802 to N of Cuilmuir View, Croy	Roman: Antonine Wall	0	9.3	North	Assessed as part of Antonine Wall World Heritage Site

SM90017	Antonine Wall and fort, railway line to 300m E of Westerwood steading	Roman: Antonine Wall	0	9.5	North	Assessed as part of Antonine Wall World Heritage Site
SM90015	Antonine Wall, N of Cumbernauld airfield to Wyndford Road	Roman: Antonine Wall	1	9.8	North	Assessed as part of Antonine Wall World Heritage Site
SM2121	Wester Craigend, dun 300m W of	Prehistoric domestic and defensive: dun	0	8.2	South west	This asset is comprised of a dun, likely of Iron Age date, located on a north facing slope overlooking the Bannockburn and its valley. A second dun, **SM2110**, lies approximately 0.65km to the north east, on the other side of the valley of the Bannockburn. The asset's position within the landscape would have afforded extensive long-distance views across the valley, particularly towards the east, south-east and north-west, allowing its inhabitants to observe and exert a degree of control over movement through the surrounding terrain and along the Bannockburn. Intervisibility with the opposing dun (**SM2110**) would have enabled this control to extend across the valley slopes in both directions, reinforcing shared oversight of passage through the Bannockburn and adjacent valleys. These characteristics form a key aspect of the asset's setting and contribute to its cultural heritage significance. Though no wind turbines are predicted to be visible from the asset, visibility of one wind turbine is predicted to be in distance views in the backdrop when viewing the asset from **SM2110.** However, views in this direction are unlikely to have been intended to extend beyond the location of the paired dun. Given the visual prominence the dun would originally have possessed, the presence of a single wind turbine at distance would not detract from the ability to understand or appreciate the intervisibility between the two assets, nor their shared role in controlling movement through the Bannockburn and its valley. The ability to appreciate, understand and experience the asset would therefore remain intact, and the asset has been scoped out of further assessment on this basis.

SM2243	Touch Muir, dun	Prehistoric domestic and defensive: dun	0	6.5	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM2584	Balcastle Farm, motte 250m SSW of	Secular: motte	0	7.1	North	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM1734	Meikle Reive, fort	Prehistoric domestic and defensive: fort (includes hill fort and promontory fort)	0	8.4	North east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM1750	Maiden Castle, motte	Secular: motte	0	9.1	North east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
SM3099	Broch, rock shelter and cup marked rocks, 165m W of Leckie House	Prehistoric domestic and defensive: broch; fort (includes hill fort and promontory fort); hut circle, roundhouse, Prehistoric ritual and funerary: cupmarks or	0	7.5	South	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

		cup-and-ring marks and similar rock art				
SM2580	King's Yett, cairn 300m W of	Prehistoric ritual and funerary: cairn (type uncertain	3	4.9	South west	This asset comprises a prehistoric burial cairn, situated in open moorland at approximately 290m AOD. It lies in close proximity to an unnamed tributary of the Bannockburn of a gentle south-east facing slope. Its location on the lower-lying, boggy land suggests a marginal position, possibly marking a routeway or the edge of a territory. The cairn would likely have been highly visible to anyone travelling along the watercourse, and perhaps even from the Bannockburn, though the section directly west of the asset has now been replaced by the North Third Reservoir. This suggests that views from the asset towards the watercourses, and towards asset when approaching along the unnamed burn from the north-east or south-west, or along the Bannockburn or its valley from the north or south would have been key to its significance. Three wind turbines are currently predicted to be visible to the south-west of the asset. These wind turbines would be present to a minor extent upon the approach along the tributary from the north-east, with all other aspects of its setting remaining intact. The presence of the wind turbines in these views would form a minor distraction at most, given the distance of approximately 5km between the asset and the Proposed Development, and are not predicted to impact the ability to appreciate, understand or experience the asset. It is therefore scoped out of further assessment.

Table 3: Category A Listed Buildings within 10km of Proposed Wind turbines

Designation Reference	Designation Title	Category	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind turbine	Appraisal
LB1062	Dullatur Village Prospect Road Dunluce	A	0	9.5	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB1063	Dullatur Village, Prospect Road, Woodend	A	0	9.4	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB8191	Gribloch House And Swimming Pool	A	0	8.8	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB10438	Gargunnock House	A	0	8.1.	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB10445	Old Leckie Including Garden Walls	A	0	8.3	South	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

LB10467	Culcreuch Castle	A	0	7.3.	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB12515	Kippen, Station Road, Dun Eaglais, Including Designed Garden	A	0	9.3	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB15275	Milnholm Hatchery	A	1	8.0	South west	This asset concerns an early brown trout and salmon hatchery constructed in 1881 for Sir James Maitland. The asset utilised the nearby Loch Coulter Burn, which runs towards the asset from the east, for a steady source of fresh water, as well as the downhill slope on which it lies for the gravitational flow of water. These aspects of its setting are of key importance, as these resources are the primary reason the location was chosen for the hatchery. The asset also shares a relationship with a second asset of a similar nature, Howietoun Fishery (**LB15306**). This fishery was also constructed for Maitland and lies approximately 0.7km to the north east of the hatchery. Their proximity to one another was likely chosen for convenience in transporting hatchlings to the fishery. As such the setting of the asset is entirely contained within itself, its proximity to flowing fresh water and its relationship to the nearby fishery, rather than any wide-ranging views. The current ZTV predicts that one wind turbine of the Proposed Development would be visible to the south-west of the asset. The presence of the wind turbine would be hardly discernible in views from the asset, as they lie a distance of approximately 8.1km from one another. The Proposed Development would not form a distraction in the landscape, and would not impact the ability to appreciate, understand or experience the asset's relationship to its immediate

						surroundings, which form the key aspects of its setting, or its relationship with Howietoun Fishery in the north-east. As such, the Proposed Development is not considered to impact the ability to understand, appreciate or experience the asset within its original setting. It has therefore been scoped out of further assessment.
LB15295	Touch House (Mrs Buchanan)	A	0	8.7	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB15303	Auchenbowie House	A	0	9.4	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB15306	Howietoun Fishery	A	0	8.4	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB36234	30 Low Craigends, St Patrick's Roman Catholic Church	A	0	7.8	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

Table 4: Category B Listed Buildings within 5km of Proposed Wind turbines

Designation Reference	Designation Title	Category	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind turbine	Appraisal
LB1964	Old Bridge Faughlin Burn	B	4	4.1	North west	This asset comprises a bridge over the Faughlin Burn, which forms part of a former drove road. It is marked on Roy's Military Map of 1747-1755 as the 'Road from Fintry to Falkirk and Edinburgh'. The asset's significance is derived from its strategic position spanning the Faughlin Burn from east to west, as the burn flows south to north into the River Carron. The bridge would have allowed for access across the burn. Long-distance views are not a part of the assets setting which contribute to its significance, given that the bridge was primarily built for its practical purpose. As long-distance views are of minor significance to the asset, peripheral views of 4 wind turbines are not predicted to impact upon the ability to appreciate, understand or experience the asset.
LB1965	New Carron Bridge	B	0	4.4	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
LB11749	Carron Bridge	B	3	3.9	North west	Built in 1695 to replace an ancient ford that had been part of a historic drove road from Kilsyth to Stirling for centuries, this bridge features two span stone arches. It appears larger than necessary because the river it crosses was much wider before the construction of Carron Dam in the 1930's, which created a reservoir. The setting of the asset which, contributes to its significance, is its position crossing the River Carron from north to south as it flows from west to east. This aspect of its setting has changed considerably since its construction in 1695, as the

						river has significantly reduced in size since the construction of the Carron Dam and Reservoir in the 1930's, though its function in this sense remains intact. Long distance views are unlikely to contribute to its significance, as the bridge was constructed primarily for the practical function of allowing an easier river crossing and replacing an earlier ford. The banks of the river near the asset have also been affected, with modern housing constructed, primarily towards the east, with a small number running up the river to the west. The current ZTV predicts that 3 of the wind turbines of the Proposed Development would be visible to the north-west from the asset. As such the wind turbines would be present in peripheral views when crossing the river from the south, along the river valley. As long-distance views are of minor significance to the asset, peripheral views of 3 wind turbines are not predicted to impact upon the ability to appreciate, understand or experience the asset and its setting.
LB12990	Bentend Steading, Nr Carron Bridge	B	3	3.4	North west	This asset comprises of an early 18th century upland farm steading, located approximately 0.1km to the south of the River Carron. Its primary significance is derived from it being a rare example of an upstanding building of this type from the period. It is shown on the Six-inch 1st Edition Ordnance Survey map of 1865 with a second building to its east, which has since been removed. The asset seems to still be in use as part of a modern farm, and as such is surrounded by modern farm buildings. As a farm steading, the asset would have made use of the fertile land on the banks of the River Carron for agricultural purposes, as well as utilising the proximity of the watercourse for fresh water for crops and livestock. Its immediate surroundings on the banks of the river therefore form its setting, with long distance views unlikely to contribute to its significance. Three wind turbines of the Proposed Development are currently predicted to be visible from the asset towards the north west. Though these wind turbines would be present in long distance views, they would not form a major distraction from the setting of the asset, which is considered to be its direct surroundings.

						The relationship between the asset and the fertile farmland surrounding it would not be impacted, nor would its relationship to the River Carron. As such the Proposed Development would not be considered to affect the ability to appreciate, understand or experience the asset, and it has therefore been scoped out of further assessment.
LB15272	Buckieburn Church	B	4	4.5	West	This asset comprises of a former church, constructed in 1750 to serve the parish of St Ninians. The asset ceased to function as a church in 2004 and is now in use as a residential property. The asset draws part of its significance from its immediate setting, which comprises the group of farmsteads surrounding it, including Wester and Easter Buckieburn to the immediate north east. Those living in these farmsteads would have formed the congregation of the church. It is anticipated that four wind turbines would be visible in views to the west. The setting of the asset and its relationship to the surrounding settlements would not be impacted by visibility of wind turbines in long-distance views. As such, the Proposed Development would form a minor distraction at most within long-distance views of the Proposed Development that would not impact the appreciation, experience and understanding of the asset and its setting. It is therefore scoped out of further assessment.
LB15307	Muirmill By Carron Bridge	B	3	2.6	North west	This asset comprises a farm complex with a farmhouse likely dating to the 18th century with a 19th century addition of a byre and dairy range, as well as a threshing mill range of a similar date. As a farmstead, the asset would have utilised the fertile low-lying land between the River Carron and the Earl's Burn for agricultural purposes. Additionally, it would have taken advantage of the nearby watercourse to provide fresh water for crops and livestock. Its immediate surroundings along the riverbanks constitute its primary setting, with long-distance views unlikely to contribute significantly to its setting. It is predicted that three wind turbines would be visible in views to the north west. The setting of the asset and its relationship to

						the surrounding agricultural land between the watercourses it would have utilised would remain unaffected by the visibility of wind turbines in these distant views. Consequently, the Proposed Development would be, at most, a minor distraction within long-distance views of the Proposed Development and would not impact the ability to appreciate, experience, or understand the asset and its setting. Therefore, it is excluded from further assessment

Table 5: Inventoried Gardens and Designed Landscapes

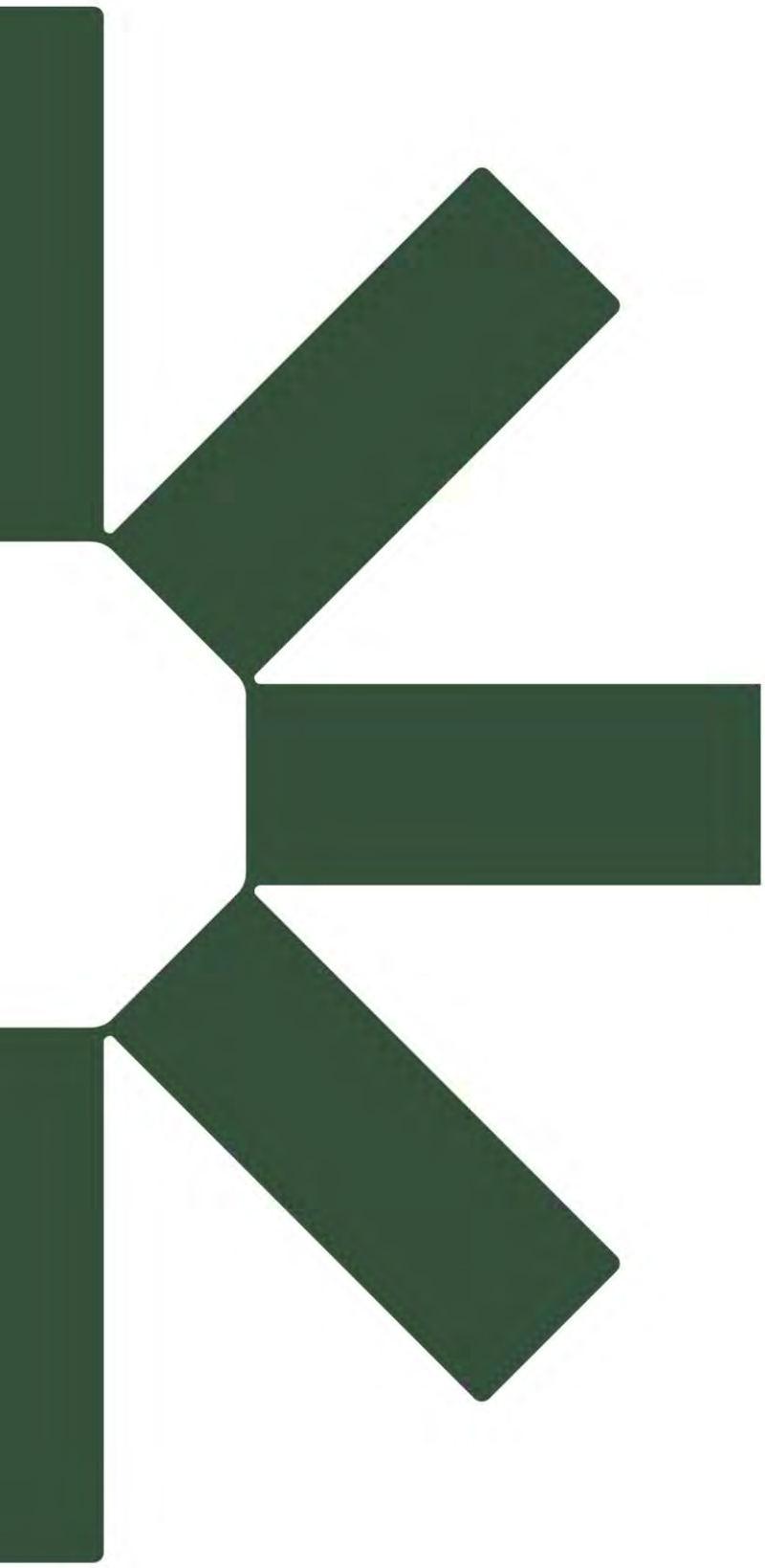
Designation Reference	Designation Title	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind turbine	Appraisal
GDL00188	Gargunnock House	0	7.9	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
GDL00377	Touch	0	7.3	South west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
GDL00410	Colzium Lennox Estate	0	6.7	North west	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.

Table 6: Inventoried Battlefields

Designation Reference	Designation Title	Proposed wind turbine Visibility	Distance to nearest proposed wind turbine	Direction to nearest proposed wind turbine	Appraisal
BTL4	Battle of Bannockburn	4	8.8	South west	The Battle of Bannockburn took place on June 23-24, 1314. It was a significant clash between the forces of Robert the Bruce, King of Scots, and King Edward II of England during the First War of Scottish Independence. This battle resulted in a decisive victory for Robert the Bruce and marked a crucial turning point in the war, which concluded 14 years later with the Treaty of Edinburgh–Northampton, officially restoring Scottish independence. Consequently, the Battle of Bannockburn is regarded as a landmark event in Scottish history. The battlefield's well-preserved landscape features the open grounds of New Park, offering views and spatial relationships between the Carse of Stirling, Stirling Castle to the north west, and hill terraces to the south west. Bannockburn itself has experienced urbanisation, with preservation largely focused along the A872 near the Carse. Views towards Stirling Castle from the battlefield remain integral and unaffected, ensuring visibility crucial for appreciating the battlefield's historical significance. Whilst the ZTV indicates that there would be between zero and four proposed wind turbines visible from within the Inventoried Battlefield, views from the Carse and the Bannock Burn are limited. Any key sightlines or approaches from the battle do not include long distance views of Cairnoch Hill, where the Proposed Development is planned, and as such would not impact the ability to understand the battlefield landscape. As such, the limited visibility of the proposed wind turbines is not expected to affect the ability to appreciate, understand or experience the battlefield's historical significance and as such it is excluded from further assessment.

BTL13	Battle of Kilsyth	0	6.2.	South east	The asset falls outwith the ZTV. Analysis of third viewpoints, including points of appreciation where the development and the asset may be appreciated together, has been undertaken. As these fall outwith the ZTV, this asset has been scoped out of further assessment.
BTL38	Battle of Sauchieburn	4	8.2	South west	The Battle of Sauchieburn took place on June 11, 1488, near Sauchie Burn, a stream located approximately 3km south of Stirling, Scotland. This conflict was between the forces of King James III of Scotland and a large faction of rebellious Scottish nobles. The rebels emerged victorious, forcing James III to flee and resulting in his death whilst attempting to escape. This battle is significant because it directly resulted in a new king taking the Scottish throne. It is also notable as one of the rare instances where a reigning King of Scotland was killed due to a battle, even though James III's death occurred during his attempt to escape rather than in the battle itself. The battle was primarily fought for control over the town of Stirling and its castle, as control of these assets allowed for control over the major routeways to north and south in Scotland at the time. Possession of them enabled the holder a strong defensive position and control over the surrounding landscape. As such, the battle was fought to the south of the town after King James III ousted the rebels from Stirling. Up to four wind turbines of the Proposed Development may be visible from the highest points of the battlefield in the north and south-east. The Deployments map associated with the battlefield listing shows the James III lines approaching from the north and the Rebel Lords approaching from the south, from the relative high points within the designated area. Due to the north-south orientation of these approaches, any lines of sight would not be impacted by views of the Proposed Development. Fighting is presumed to have taken place in the higher ground to the north of the site, around the Carse, where visibility of the proposed wind turbines is highest, however, as previously stated the wind turbines are not present in any key views or approaches from this area. Furthermore, key views of Stirling Castle from the battlefield, remain intact and unaffected, which allows for the continued appreciation of the historical significance of the site. The Proposed Development

					would not impact the ability to understand the interaction of the battlefield with its landscape. In addition, given the 8.8km distance from the battlefield's edge to the Proposed Development, any wind turbines would be nearly imperceptible from this vantage point, minimizing any potential distraction from the battlefield's landscape. Therefore, the limited visibility of the proposed wind turbines on a distant hilltop is not expected to affect the ability to appreciate, understand, or experience the battlefield's historical significance, and it is therefore excluded from further assessment.



Making Sustainability Happen

Technical Appendix 12.1: Turbine Delivery Route Feasibility Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

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Prepared by:

SLR Consulting Limited

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SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	3 August 2026	I. Lamb	A. Smith	A. Smith

Basis of Report

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Acronyms and Abbreviations

AIL	Abnormal Indivisible Load
AILV	Abnormal Indivisible Load Vehicle
FLS	Forestry and Land Scotland
HGV	Heavy Goods Vehicle
M9	Motorway 9
OS	Ordnance Survey
SLR	SLR Consulting Limited
STGO	Special Types General Order
UK	United Kingdom

1.0 Introduction

1.1 Background

1.1.1 Eurowind Energy Limited ("the Applicant") is seeking planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) ("the Planning Act") to install and operate up to four wind turbines (up to 180m to blade tip) and associated infrastructure (collectively referred to as "the Proposed Development") on land owned by the Scottish Ministers and managed by Forestry and Land Scotland (FLS) at Cairnoch Hill within the administrative boundary of Stirling Council ("the Site"). The Site (which is the area encompassed by the application boundary) location is shown in **Figure 12.1.1**.

1.2 Scope of Report

1.2.1 This report considers the feasibility of delivering the wind turbine blades and tower sections to the Site. The exact model of wind turbine for the Proposed Development remains to be decided, but this exercise has been carried out based on an 86m long wind turbine blade.

1.2.2 The study considers feasibility from the point of view of the ability of the vehicles carrying the wind turbine blade and tower components to be accommodated within the confines of the road carriageway and any adjoining footways and verges.

1.2.3 Identification of road signage, etc. to be temporarily removed and clearance of trees and hedges has not been specifically identified in this report. These elements would be considered as part of the detailed analysis to be completed by the haulage contractor commissioned to transport the components at the time of delivery.

1.2.4 Following on from this introduction, the report presents the following sections:

250000 260000 270000 280000 290000

700000 690000 680000

LEGEND

Site Boundary

N



Eurowind Energy™

SLR

CAIRNOCH HILL WIND FARM

EIAR - TA 12.1 - TURBINE DELIVERY ROUTE FEASIBILITY ASSESSMENT

SITE LOCATION

FIGURE 12.1.1

Scale 1:150,000 @ A3

Date MAY 2026

0 2.5 5 10

Kilometres

428.V12085.00001.0166.0 Site Location

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2.0 Legislative and Policy Background

2.1 Legislation

2.1.1 Vehicle sizes on the UK's public road network are stipulated by The Road Vehicles (Construction and Use) Regulations 1986. Generally, articulated vehicles (such as an articulated Heavy Goods Vehicle (HGV)) are limited to 16.5m in length (18m in length is allowed where the semi-trailer is a low loader), 2.9m in width and 44 tonnes gross (i.e. laden) weight.

2.1.2 The Road Vehicles (Authorisation of Special Types) (General) Order 2003 covers vehicles with a dimension exceeding any of the maxima in The Road Vehicles (Construction and Use). That order refers to such vehicles as Abnormal Indivisible Load Vehicles (AILVs) and defines an Abnormal Indivisible Load (AIL) as:

"a load that cannot without undue expense or risk of damage be divided into two or more loads for the purpose of being carried on a road and that—

(a) on account of its length, width or height, cannot be carried on a motor vehicle of category N3 or a trailer of category O4 (or by a combination of such vehicles) that complies in all respects with Part 2 of the Construction and Use Regulations; or

(b) on account of its weight, cannot be carried on a motor vehicle of category N3 or a trailer of category O4 (or by a combination of such vehicles) that complies in all respects with—

(i) the Authorised Weight Regulations (or, if those Regulations do not apply, the equivalent provisions in Part 4 of the Construction and Use Regulations); and

(ii) Part 2 of the Construction and Use Regulations."

2.1.3 AILVs require a Special Types General Order (STGO) to move. There are three categories of STGO:

- Category 1: 46 tonnes over five axles or 50 tonnes over six axles.
- Category 2: up to 80 tonnes over six or more axles with a maximum of 12.5 tonnes per axle; and
- Category 3: up to 150 tonnes over six or more axles with a maximum of 16.5 tonnes per axle.

2.1.4 AILVs which don't comply with the three categories of STGO can be moved under a 'Special Order'. A 'Special Order' is required for AILVs greater than:

- 150,000kg or 16,500kg in weight per axle;
- 6.1 metres wide; and
- 30 metres long in rigid length when loaded

2.1.5 There is no legal maximum height for loads being transported on public roads in the United Kingdom. Any bridge that has a height clearance of 5.03m or less legally must have a warning sign on the road approaching it. Those structures along a route that are passed under which do not display a height warning sign are considered to have at least 5.03m clearance.

2.2 Policy

2.2.1 There is a 'Water preferred policy' for the movement of AILs which states:

"To reduce the distance that abnormal loads move by road, coastal waters will continue to be the preferred transport mode over longer distances. This means taking the load by road to the nearest coastal port unless there is a nearer suitable abnormal load landing facility".

2.2.2 In practice, this means that the turbine components would be delivered to the nearest suitable port to the Proposed Development, before continuing their journey by road.

3.0 Route Assessment

3.1 Introduction

3.1.1 The wind turbine components would be classed as AILs by virtue of at least their length and weight, and so AILVs would be required to deliver them to the Site. The wind turbine components would be delivered by ship to a suitable port near to the Site and then transported to the Site by AILVs. A potential route for those AILVs has been identified and reviewed to identify locations where more detailed investigations of feasibility are warranted. Swept path assessments have been undertaken using the software Autodesk Vehicle Tracking at such locations.

3.2 Ports

3.2.1 The nearest suitable port to the Site would be The Port of Grangemouth, located around a 31km drive from the Site. Rosyth and King George V Dock in Glasgow would be potential alternatives, although these are located around a 64km and a 67km drive from the site respectively. For the purposes of this report, turbine components have been assumed to be delivered to The Port of Grangemouth given its proximity.

3.3 Potential Route

3.3.1 A proposed route from The Port of Grangemouth to the Site was identified and is shown in **Figure 12.1.2**. The route involves:

- Leaving The Port of Grangemouth via Central Dock Road and passing through Timber basin Roundabout to gain access to the A904;
- Turning right at Earl's Gate Roundabout to join the M9 northbound;
- Travelling northbound on the M9 towards Stirling and exiting at Junction 9 and turning left onto the A872;
- Travel southbound on the A872 through Dunipace, crossing the River Carron via Denny Bridge, before turning right at the mini roundabout formed between the A872 Stirling Steet, A872 Nethermains Road, and the A883 Stirling Street;
- Travelling south-westwards on the A872 Nethermains Road before turning right onto the B818 and passing under the M80; and
- Travelling westwards along the B818, before turning right at the access to the Site.

270000 275000 280000 285000 290000

695000 690000 685000

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed Access Point Location
- Port of Grangemouth
- Swept Path Assessment Location
- Abnormal Indivisible Load Vehicle (AILV) Route

Reference:

1 - Timber Basin Roundabout
2 - Earls Gate Roundabout
3 - M9 Junction 9
4 - A872 Stirling Street / Barnego Road
5 - Denny Bridge to A872 / Stirling Street Junction
6 - A872 / B818 Junction
7 - B818 / Kirkland Drive / Redwood Drive Junction
8 - B818 at Strathcarron Hospice
9 - B818 East of Crummocksteps
10 - B818 Bridge at Crummocksteps
11 - B818 at Crummocksteps
12 - B818 West of Crummocksteps
13 - B818 at Grayswalls Cottage
14 - B818 at Topps Farm
15 - B818 at Bridge over River Carron
16 - B818 / Tak-M-Doon Road Junction
17 - B818 at Carron Valley Hamlet
18 - B818 West of Carron Valley Hamlet
19 - B818 at Access to Proposed Development

T1 T2 T3 T4

STIRLING DENNY FALKIRK CUMBERNAULD KILSYTH ALLOA CLACKMANNAN GLASGOW

Touch Hills Gargunnock Hills Fallin Bannockburn Cowie Plean Airth Carron Valley Forest Kilsyth Hills

0 1.25 2.5 5
Kilometres

428.V12085.00001.0165.0 AILV Route and Swept Paths

Eurowind Energy

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CAIRNOCH HILL WIND FARM

EIAR - TA 12.1 - TURBINE DELIVERY ROUTE FEASIBILITY ASSESSMENT

POTENTIAL AILV ROUTE AND LOCATION OF SWEPT PATH ASSESSMENTS

FIGURE 12.1.2

Scale	Date
1:80,000 @ A3	MAY 2026

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3.3.2 The ability of the structures along the route of the AILV deliveries to accommodate the weight of the laden AILVs would be investigated nearer to the time of the turbine component deliveries (should consent be granted). This would be in line with standard practice as evidenced by condition 24(1)(e) in the Scottish Government's Standard Onshore Wind Conditions which requires "*An assessment of the capacity of any bridge crossings on the route to cater for abnormal loads, and details of proposed upgrades and mitigation measures required for any bridge crossings*".

3.3.3 The potential route from The Port of Grangemouth to the Site was visited by members of the project team and locations along the route were identified where it was considered that detailed swept path assessments of the AILVs were required.

3.4 Swept Path Assessments

Vehicle Configuration

3.4.1 Swept path assessments were undertaken using three vehicle types, namely:

- An AILV with a DOLL trailer carrying an 86m long turbine blade. A DOLL trailer uses a multi-axle self-propelled unit that is independently steered. There is no rigid connection between the tractor and trailer unit except for cables providing power;
- A Blade lifter carrying an 86m long turbine blade; and
- A Tower Transporter carrying a 33m long tower section.

3.4.2 AILVs carrying loads of those dimensions would require to be authorised under a 'Special Order' as per paragraph 2.1.4.

3.4.3 With the DOLL carrier vehicle type, at the tractor unit, the rotor end of the blade is held in a clamp which can be hydraulically raised and lowered as necessary to provide appropriate ground clearance. It can also be rotated by up to 80 degrees providing greater flexibility for travelling around bends.

3.4.4 The tip end of the blade is held in a frame on the trailer unit and is also capable of rotating on the trailer by up to 80° in either direction. The frame can raise and lower the blade tip to increase ground clearance, depending on the exact configuration used by the haulier.

3.4.5 The location of the DOLL trailer in relation to the blade tip will influence the swept path. The closer the DOLL trailer is to the tip of the blade the shorter the rear overhang will be. This has the effect of reducing the oversail on the outside of bends but increasing the oversail on the inside of bends to allow the body of the blade to pass.

3.4.6 The height of the blade tip when it is mounted on the vehicle will be between two and five metres above road level, depending upon the frame, the loading and the curvature of the blade. At the rotor end the blade can be as little as 0.25m off the road but can be raised by up to 1.8m when necessary.

3.4.7 As there is no physical connection between the tractor unit and DOLL trailer, the blade body will be able to pass over most low-level obstructions within the verge on the inside of bends, with the blade tip able to oversail most verge side obstructions on the outside of bends.

3.4.8 A wind turbine blade lifter is a specialised vehicle designed to transport wind turbine blades, able to tilt the blade to a vertical or near-vertical position (up to 60° or even 83°) during transport. The blade lifter can also rotate the blade to avoid crosswinds and navigate tight spaces.

3.4.9 The blade is connected to the vehicle at a single point, and with its additional manoeuvrability of the blade while attached is generally able to pass through tighter routes and minimise land overrun. The blade is also able to be lowered to a horizonal position to pass through locations where there is a height constraint (e.g. overhead bridges).

3.4.10 The number of axles in the vehicle configuration will depend on the weight of the blade, the route being travelled and potential weather conditions. It should be noted that it is only the weight of the trailer that will stop the vehicle from toppling over, therefore the number of axles tested in this study is only approximate at this stage and may increase or decrease when a haulage company becomes involved.

3.4.11 In addition to the physical and geometric constraints tested within this study, other factors including wind speed must be considered during transport.

Swept Path Methodology

3.4.12 Swept path assessments were based on Ordnance Survey mapping using bespoke vehicle and load combinations to reflect a DOLL trailer carrying an 86m long turbine blade, and with the same length of blade on a blade lifter, and a Tower Transporter carrying a 33m long tower section. The test vehicles modelled by SLR are based on generic standard vehicles contained in the Autodesk Vehicle Tracking software library. The standard vehicles were modified in length and for the number of axles on the trailer. The turning properties of the vehicles have not been modified. The layout of the vehicles used in the swept path assessments is shown in **Drawing 1001** in **Annex A: Swept Path Assessment Drawings.**

3.4.13 All the swept path assessments using the DOLL trailer assumed manual override of the rear axle steering. The trailer element of the AILV used to deliver the components would therefore need to be equipped to allow it to be independently steered.

3.4.14 Prior to the moving of any load from The Port of Grangemouth to the site, the appointed haulage contractor will undertake a test run of the entire route. This will confirm the constraints identified within the swept path assessments and identify in detail items such as street furniture to be removed, cabinets and pedestrian guard railing which can be oversailed, and any planting that needs to be trimmed to allow the passage of the AILVs.

3.4.15 The swept path assessments were undertaken at the locations shown in **Figure 12.1.2** and are provided in Drawings 1002 to 1029 in Annex A. The swept path assessments are also summarised in **Table 3-1**.

3.4.16 Where the assessments have identified the requirement for overrun, or the trimming of any trees or hedging in private ownership, these will require the permission of the relevant landowner.

3.4.17 The swept path assessments of the turbine blade are based on a longer blade than is now proposed and therefore are more onerous than would be expected from the now-proposed candidate wind turbine.



Table 3-1: Summary Table

Key:

Assessment shows that vehicle could undertake the tested manoeuvre within the existing road geometry.
Assessment shows that vehicle could undertake the tested manoeuvre if works are undertaken at the pinch point.
Assessment shows that vehicle could not undertake the tested manoeuvre within the existing road geometry, even if minor works were undertaken.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
001	Central Dock Road left turn onto North Shore Road and Timber Basin Roundabout	Blade Dolly	ATR01	1002	Required to be temporarily removed.	Blade oversails land on both sides of junction and roundabout island.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the blade body will extensively oversail land to the southeast of the Central Dock Road / North Short Road junction, and west of North Shore Road. And oversails central island of roundabout.
		Blade Lifter	ATRO2	1002	Required to be temporarily removed.	Blade oversails land on north side of junction, and east side of roundabout and roundabout island.	Not required.	Assessment shows that use of full width of road will be required. Assessment shows that the blade body will extensively oversail land to the north and west of the Central Dock Road / North Short Road junction, and land to the east of the roundabout and the central island of roundabout.
		Tower Section	ATR46	1021	Required to be temporarily removed.	Tower section oversails land on east side of southbound exit from roundabout.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the east of the southbound exit from the roundabout.
002	Earls Gate Roundabout	Blade Dolly	ATR17	1003	Required to be temporarily removed.	Blade oversails land to east of A905(S) approach (car park).	Vehicle overrun required on south side of roundabout (footway and splitter island)	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows blade body will pass closely to bridge structure of M9 as it passes over the roundabout. Area of overrun required.
		Blade Lifter	ATR43, ATR44, and ATR 45	1003	Required to be temporarily removed.	Blade oversails land to east of A905(S) approach (car park).	Not required.	Assessment shows that use of full width of road will be required. Blade lifter would require to lower the blade to pass under the M9. When passing under the M9, the Blade lifter would have to drive westwards, with an area of new carriageway / runover required to replace a section of existing splitter island and verge. The Blade lifter could then raise the blade, reverse eastwards, before turning around the roundabout and exiting northbound to the M9. The traffic management implications of this would need to be discussed and with the roads authorities and their agreement sought.
		Tower Section	ATR47	1021	Required to be temporarily removed.	Tower section oversails verge on west side of northbound exit from roundabout.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the west of the northbound exit from the roundabout.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
003	M9 J9 Bannockburn Roundabout	Blade Dolly	ATR03	1004	Required to be temporarily removed.	Blade oversails land to the north and south of northbound off slip.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the blade body will extensively oversail land to the north and south of northbound offslip – likely to require tree removal.
		Blade Lifter	ATR21	1004	Required to be temporarily removed.	Blade oversails land to the north of northbound off slip	Not required.	Assessment shows that use of full width of road will be required. Blade would oversail verge to the north of the northbound off slip.
		Tower Section	ATR48	1022	Required to be temporarily removed.	Tower section oversails land to the east where northbound off slip meets roundabout.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the east of where northbound of slip meets roundabout circulatory carriageway.
004	Stirling Street / Barnego Road junction, Denny	Blade Dolly	ATR04	1005	Required to be temporarily removed.	Blade oversails land to the east and west of Stirling Road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would strike building on Stirling Road.
		Blade Lifter	ATR22	1005	Required to be temporarily removed.	Blade oversails land in front of property at 175 Stirling Street	Not required.	Assessment demonstrates that the blade lifter and blade would be able to negotiate this part of route.
		Tower Section	ATR49	1022	No issue.	Not required.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles.
005	Denny Bridge to Stirling Road / Nethermains Road mini roundabout	Blade Dolly	ATR05	1006	Required to be temporarily removed.	Blade oversails (and strikes) properties on both side of Stirling Road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would strike buildings on Stirling Road.
		Blade Lifter	ATR022	1006	Required to be temporarily removed.	Blade oversails land property at 146 Stirling Road.	Required to remove oversail of property at 146 Stirling Road.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. The construction of an area of hardstanding to the west of the mini roundabout would give a level of comfort for blade to pass property at 146 Stirling Road.
		Tower Section	ATR49	1023	Required to be temporarily removed.	Tower section oversails land to the northwest of the mini roundabout.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the west of the mini roundabout.
006	A872 Nethermains Road / B818 junction	Blade Dolly	ATR06	1007	Required to be temporarily removed.	Blade oversails verge on both side of the junction.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. The verge / open land is raised on the east side of the junction. The tail of the blade would strike this raised verge.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
		Blade Lifter	ATR23	1007	Required to be temporarily removed.	Blade oversails verge on both side of the junction.	Small area of overrun on footway on north side of B818 t junction.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. The construction of a small area of hardstanding on the northwest corner of the junction may be required. The blade when raised will pass over the raised verge on the east side of the junction.
		Tower Section	ATR50	1023	Required to be temporarily removed.	Tower section oversails land to the north of the junction.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the north of the junction.
007	B818 / Kirkland Drive / Redwood Drive roundabout	Blade Dolly	ATR07	1008	Required to be temporarily removed.	Blade oversails verge and gardens of private properties on both sides of the road.	Vehicle would overrun the central island of the roundabout.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Central island of roundabout would require to be temporarily reconstructed to allow vehicle to pass straight through.
		Blade Lifter	ATR24	1008	Required to be temporarily removed.	Blade oversails wooded areas on both sides of road, east of the roundabout.	Vehicle would overrun the central island of the roundabout.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Overhead cables would have to be removed or re-routed for blade lifter to pass. Central island of roundabout would require to be temporarily reconstructed to allow vehicle to pass straight through.
		Tower Section	ATR50	1024	Required to be temporarily removed.	Oversail limited to footways.	Vehicle would overrun the central island of the roundabout.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Central island of roundabout would require to be temporarily reconstructed to allow vehicle to pass straight through.
Route between Pinch Point 007 at 008								Overhead cables will require to be relocated to allow blade lifter to pass with blade raised.
008	B818 at Strathcarron Hospice	Blade Dolly	ATR08	1009	Required to be temporarily removed.	Blade oversails private land on both sides of the road.	Overrun of southern footway required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would strike high stone wall on south side of road and require trees to be removed on northern side.
		Blade Lifter	ATR25	1009	Required to be temporarily removed.	Blade oversails wooded area north of the carriageway, east of the cottage.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Overhead cables would have to be removed or re-routed for blade lifter to pass. Trees to the north of the road, east of the cottage, and along the route where they overhang the carriageway would require to be cut back. Due to the potential interaction with a high stone wall at this location, it is recommended that a topographic survey is undertaken in this area to establish accurately the available space for the vehicle manoeuvre.
		Tower Section	ATR50	1024	No issue.	Oversail limited to footways.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles.
Note presence of high voltage overhead cables west of Fankerton								

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
009	B818 east of stone bridge to the east of Crummocksteps.	Blade Dolly	ATR09	1010	None identified in area.	Blade oversails fields on both sides of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and potentially strike land on either side of the road due topography.
		Blade Lifter	ATR26	1010	None identified in area.	Blade oversails fields to north of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route.
		Tower Section	ATR51	1025	None identified in area.	Tower section oversails land to the north and south of the B818.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the north and south of the B818.
010	B818 at stone bridge to the east of Crummocksteps	Blade Dolly	ATR09	1011	None identified in area.	Blade oversails fields on both sides of the road.	Vehicle would not be able to negotiate available road width at bridge	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and potentially strike land on either side of the road due topography.
		Blade Lifter	ATR28	1011	None identified in area.	Blade oversails fields to south of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. The trimming, or potential removal of a mature tree on the south side of the road would be required. Due to the potential inaccuracy of the OS mapping data, and the interaction with a stone bridge, it is recommended that a topographic survey is undertaken in this area to establish accurately the available space for the vehicle manoeuvre.
		Tower Section	ATR52	1025	None identified in area.	Tower section oversails the northern wall of the stone bridge. Load would require to be lifted above wall height.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail the northern wall of the stone bridge.
011	B818 at Crummocksteps Farm	Blade Dolly	ATR09	1012	None identified in area.	Blade oversails fields on both sides of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail land and strike buildings which form part of Crummocksteps Farm.
		Blade Lifter	ATR29	1012	None identified in area.	Blade oversails fields to south of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. The trimming, or potential removal of a mature tree on the south side of the road would be required. As the vehicle passes to the west of the farm buildings, a large mature tree would require to be trimmed to allow the blade to pass while in the lifted position. Overhead cables will require to be relocated to allow blade lifter to pass with blade raised.
		Tower Section	ATR53	1025	None identified in area.	Tower section oversails land to the north and south of the B818.	Vehicle would require to overrun land to the west of the B818 as it passes the farm building.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
								Assessment shows that an area of overrun / road widening would be required on the west side of the B818 to allow the vehicle to pass the farm buildings.
012	B818 at stone bridge 0.2 miles north of Crummocksteps Farm	Blade Dolly	ATR010	1013	None identified in area.	Blade oversails land on both sides of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail land on both sides of the road. Blade would have to be raised to pass over stone bridge. Trees and electrical cables would need to be removed along roadside.
		Blade Lifter	ATR30	1013	None identified in area.	Blade oversails land on south side of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on south side of the road. Trees and electrical cables would need to be removed along roadside. Due to the potential inaccuracy of the OS mapping data, and the interaction with a stone bridge, it is recommended that a topographic survey is undertaken in this area to establish accurately the available space for the vehicle manoeuvre.
		Tower Section	ATR53	1026	None identified in area.	Blade oversails land on east side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the east of the B818.
Between pinch points 012 and 013 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
013	B818 at Grayswalls Cottage	Blade Dolly	ATR11	1014	None identified in area.	Blade oversails land on north and south side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail land on both sides of the road. Trees and electrical cables would need to be removed along roadside.
		Blade Lifter	ATR31	1014	None identified in area.	Blade oversails land on north side of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north side of the road. Trees and electrical cables would need to be removed along roadside.
		Tower Section	ATR55	1026	None identified in area.	Blade oversails land on south side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the south of the B818.
Between pinch points 013 and 014 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
014	Series of bends on the B818 at Topps Farm	Blade Dolly	ATR12	1015	None identified in area.	Blade oversails land on north and south side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
								Assessment shows blade would strike building at 'The Topps Park'
		Blade Lifter	ATR32	1015	None identified in area.	Blade oversails land on north and south side of the road.	Not required.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north and south side of the road. Trees would need to be trimmed or removed, and electrical cables would need to be removed along roadside.
		Tower Section	ATR54	1027	None identified in area.	Tower section oversails land to the north and south of the B818.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the north and south of the B818.
Between pinch points 014 and 015 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
015	B818 at bridge of River Carron	Blade Dolly	ATR13	1016	None identified in area.	Blade oversails land on north and south side of the road.	Required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside. Assessment shows blade would potentially strike land to the south of B818 due to the topography; vehicle may also not be able to negotiate available road with over stone bridge.
		Blade Lifter	ATR33	1016	None identified in area.	Blade oversails land on south side of the road.	Potentially.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route, however it appears to have minimal margin of error, and use of the OS mapping is not fully conclusive. It is recommended that a topographic survey is undertaken in this area to establish accurately the available space for the vehicle manoeuvre. Assessment demonstrates that the blade would oversail and land on north and south side of the road prior to crossing over the bridge, however the height on planting on the adjacent slope should not require to be trimmed. Electrical cables would need to be removed along roadside.
		Tower Section	ATR57	1027	None identified in area.	Tower section oversails land on north side of the road.	Potentially.	Assessment demonstrates that the tower section would negotiate this part of route, however it appears to have minimal margin of error, and use of the OS mapping is not fully conclusive. It is recommended that a topographic survey is undertaken in this area to establish accurately the available space for the vehicle manoeuvre and if any works to the bridge parapets are required. Assessment demonstrates that the tower section would oversail and land on north side of the road prior to crossing over the bridge, and the northern wall of the bridge. Electrical cables would need to be removed along roadside.
Between pinch points 015 and 016 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
016	B818 at Tak-ma-Doon Road Junction	Blade Dolly	ATR14	1017	Not required to be removed.	Blade oversails land on north and south side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
								Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside. Assessment shows blade would potentially strike building in south east corner of junction.
		Blade Lifter	ATR34	1017	Not required to be removed.	Blade oversails land on north and south side of the road.	Small area to north of road, west of house.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north and south side of the road. Trees would need to be trimmed or removed, and electrical cables would need to be removed along roadside. Small area of runover would need to be constructed.
		Tower Section	ATR58	1028	Not required to be removed.	Tower section oversails land on north side of the road.	Small area to north of road, west of house.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the north and south of the B818. Small area of overrun would need to be constructed.
Between pinch points 016 and 017 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
017	Carron Valley Hamlet	Blade Dolly	ATR15	1018	Not required to be removed.	Blade oversails land on north and south side of the road.	Small area to north and south of road, west of house.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside. Areas of overrun identified on inside of bends.
		Blade Lifter	ATR35 to ATR37	1018	Not required to be removed.	Blade oversails land on north and south side of the road.	Small area to north and south of road.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north and south side of the road. Trees would need to be trimmed or removed, and electrical cables would need to be removed along roadside. Small areas of runover would need to be constructed.
		Tower Section	ATR59	1028	Not required to be removed.	Tower section oversails land on north side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment shows that the tower body will oversail land to the north and south of the B818. Trees and electrical cables would need to be removed along roadside.
018	B818 west of Carron Valley Hamlet	Blade Dolly	ATR15	1019	Not required to be removed.	Blade oversails land on north and south side of the road.	Small area to north and south of road, west of house.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside. Areas of overrun identified on inside of bends.

Pinch Point Reference	Constraint Location Description	Vehicle	Layer	Drawing Number (Annex A)	Street Furniture	Oversail	Overrun	Comments
		Blade Lifter	ATR38 and ATR39	1019	Not required to be removed.	Blade oversails land on north and south side of the road.	Small area to north and south of road.	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north and south side of the road. Trees would need to be trimmed or removed, and electrical cables would need to be removed along roadside. Small areas of runover would need to be constructed.
		Tower Section	ATR59	1029	Not required to be removed.	Tower section oversails land on north and south side of the road.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the tower section would oversail and land on both sides of the road. Trees and electrical cables would need to be removed along roadside.
Between pinch points 018 and 019 on the B818								Electrical cables will require to be removed along route, with trees on roadside requiring to be trimmed or removed.
019	Site Access from B818	Blade Dolly	ATR16	1020	Not required to be removed.	Blade oversails land on north and south side of the road. Large area of oversail as vehicle makes right turn into site from the B818.	Large area of overrun identified at site access.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the blade would oversail and land on both sides of the road. Trees would need to be removed along roadside. Areas of overrun at site access.
		Blade Lifter	ATR40	1020	Not required to be removed.	Blade oversails land on north and south side of the road. Large area of oversail to the south of the site access as vehicle makes right turn into site from the B818.	Not required	Assessment demonstrates that the blade lifter and blade would negotiate this part of route. Assessment demonstrates that the blade would oversail land on north and south side of the road. Assessment appears to show blade would be above trees to the south of the road. Assumes site access can be widened to accommodate vehicle.
		Tower Section	ATR60	1029	Not required to be removed.	Tower section oversails land on north side of the road as it turns into site access.	Not required.	Assessment shows that use of full width of road will be required. Assessment used manual control of rear axles. Assessment demonstrates that the tower section would oversail and land on north side of the road.
All manoeuvres north of this point will be within the site / not on the public road network, with the access track upgraded as required.								

4.0 Summary

4.1.1 SLR Consulting Limited was commissioned by the Applicant to assess the feasibility of delivering the wind turbine components to the Site of the proposed Cairnoch Hill Wind Farm.

4.1.2 This report considers the feasibility of delivering the wind turbine blades and tower sections to the Site, namely the ability of the vehicle carrying the turbine blade components to be accommodated within the confines of the road carriageway and any adjoining footways and verges.

4.1.3 The study took cognisance of relevant legalisation regarding vehicle sizes permitted on UK roads, and the relevant policy requiring abnormal loads to be moved by ship to the nearest port.

4.1.4 A route assessment was undertaking using Autodesk Vehicle Tracking software to identify constraints to the movement of turbine components to the Site, via an identified route from The Port of Grangemouth.

4.1.5 The swept paths assessments undertaken as part of the route assessment considered an AILV with a DOLL trailer carrying an 86m long turbine blade, a Blade Lifter carrying an 86m long turbine blade, and a Tower Transporter carrying a 33m long tower section and were based on Ordnance Survey digital mapping.

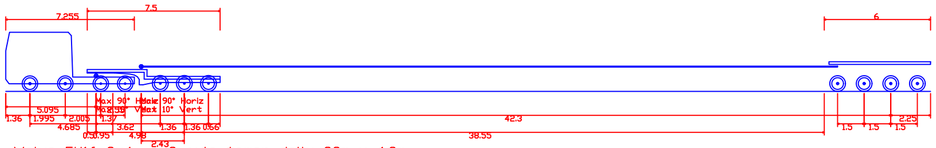
4.1.6 The route assessment identified several locations whereby a AILV with a DOLL trailer carrying an 86m long turbine blade would not be able to successfully negotiate the route, namely from the A872 / A833 Nethermains Road / Stirling Street junction onwards to the Site. From this point onwards, the assessment shows that a Blade Lifter would be required to transport the 86m long turbine blade past many of the identified pinch points.

4.1.7 The assessment also identified that there are some locations along the route to the Site whereby the swept paths for the Blade Lifter and Tower Transporter are not conclusive, and it is recommended that a topographical survey is undertaken to determine the accurately the available road space. This is particularly relevant to locations where the route passes over stone bridges on the B818.

4.1.8 While not a geometric constraint identified via the swept path analysis, there are numerous locations along the route where electric cables will require to be relocated, where they are either adjacent to, or cross over the carriageway.

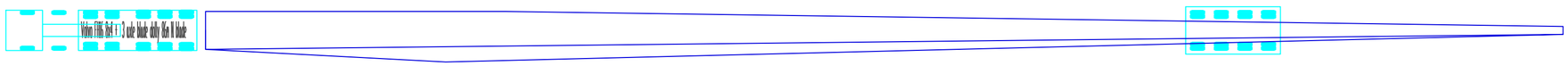
Annex A: Swept Path Assessment Drawings

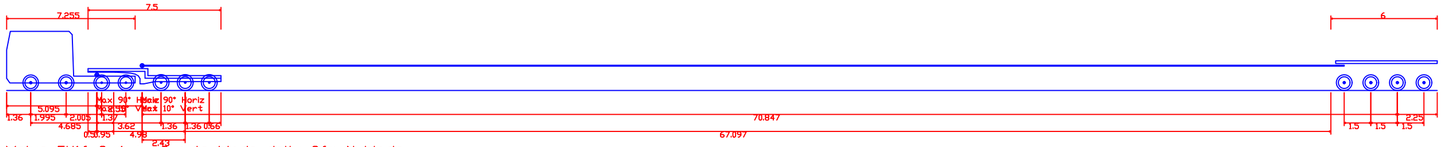




Volvo FH16 8x4 + 3 axle tower dolly 33m x 4.2m

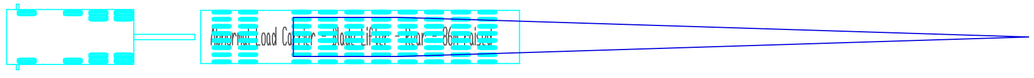
Overall Length	52.195m
Overall Width	3.000m
Overall Body Height	3.335m
Min Body Ground Clearance	0.375m
Max Track Width	2.550m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

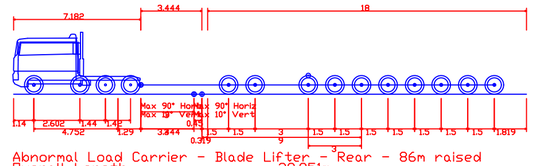




Volvo FH16 8x4 + 3 axle blade dolly 86m N blade

Overall Length	80.742m
Overall Width	3.000m
Overall Body Height	3.335m
Min Body Ground Clearance	0.375m
Max Track Width	2.550m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m





Abnormal Load Carrier - Blade Lifter - Rear - 86m raised

Overall Length	28.951m
Overall Width	3.100m
Overall Body Height	3.495m
Min Body Ground Clearance	0.420m
Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

Notes:

Legend:

Rev	Amendments	Date	By	Chk	Auth

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis Vehicle profiles: AILV with a DOLL trailer, a Blade Lifter, and a Tower Transporter

Scale	SLR Project No.
NTS @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1001**

Rev.

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 10 20 30 40 50 60 70 80 90 100m

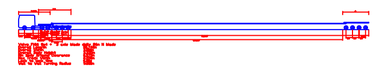
Scale 1:1,000

Notes:

1. This drawing is based on OS Mastermap data.
2. SLR takes no responsibility for the accuracy of this data.
3. Swept path analysis indicates vehicle model sweep lines only and no allowance has been included for edge stability, driver perception, working area or consideration of topography.
4. No engineering works have been included.
5. Area of overrun identifies the minimum area where construction of a suitable load bearing surface will be required for use by the AIL vehicle.
6. Area of oversail identifies the minimum area which will be required to be cleared of all obstructions such as vegetation and street furniture.
7. Swept Path has been assessed on a generic 86m blade, which is modelled on a 4 axle tractor unit with the DOLL Blade. Clamp & Bogie System, which has a rear bogie with 3 axles which are all capable of steering, and a generic 86m blade transporter by a Bladelifter style vehicle
8. SPA has been undertaken utilising manual rear wheel steering.

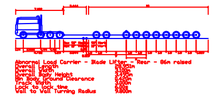
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 001
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:1000 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1002**

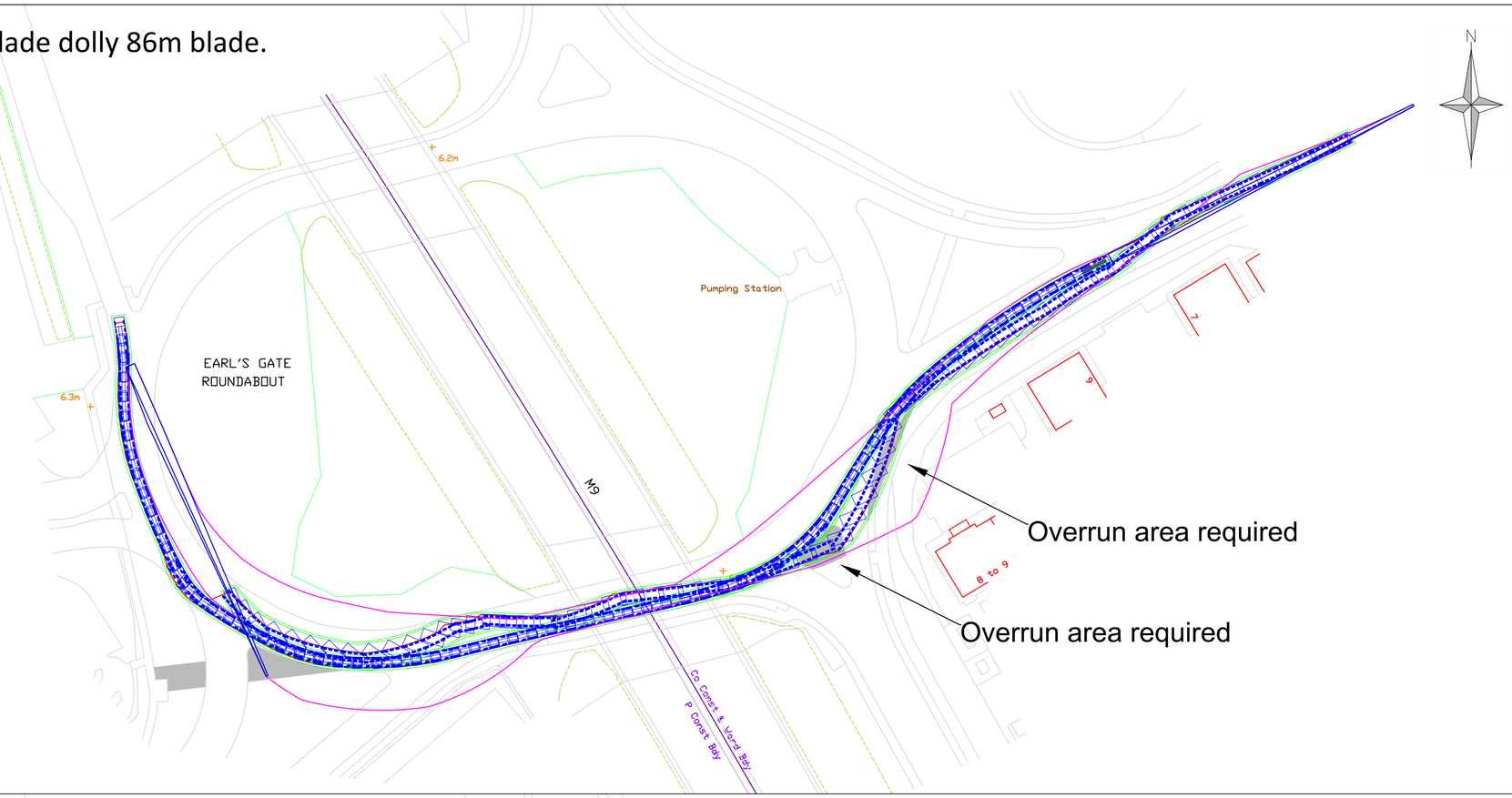
Rev.

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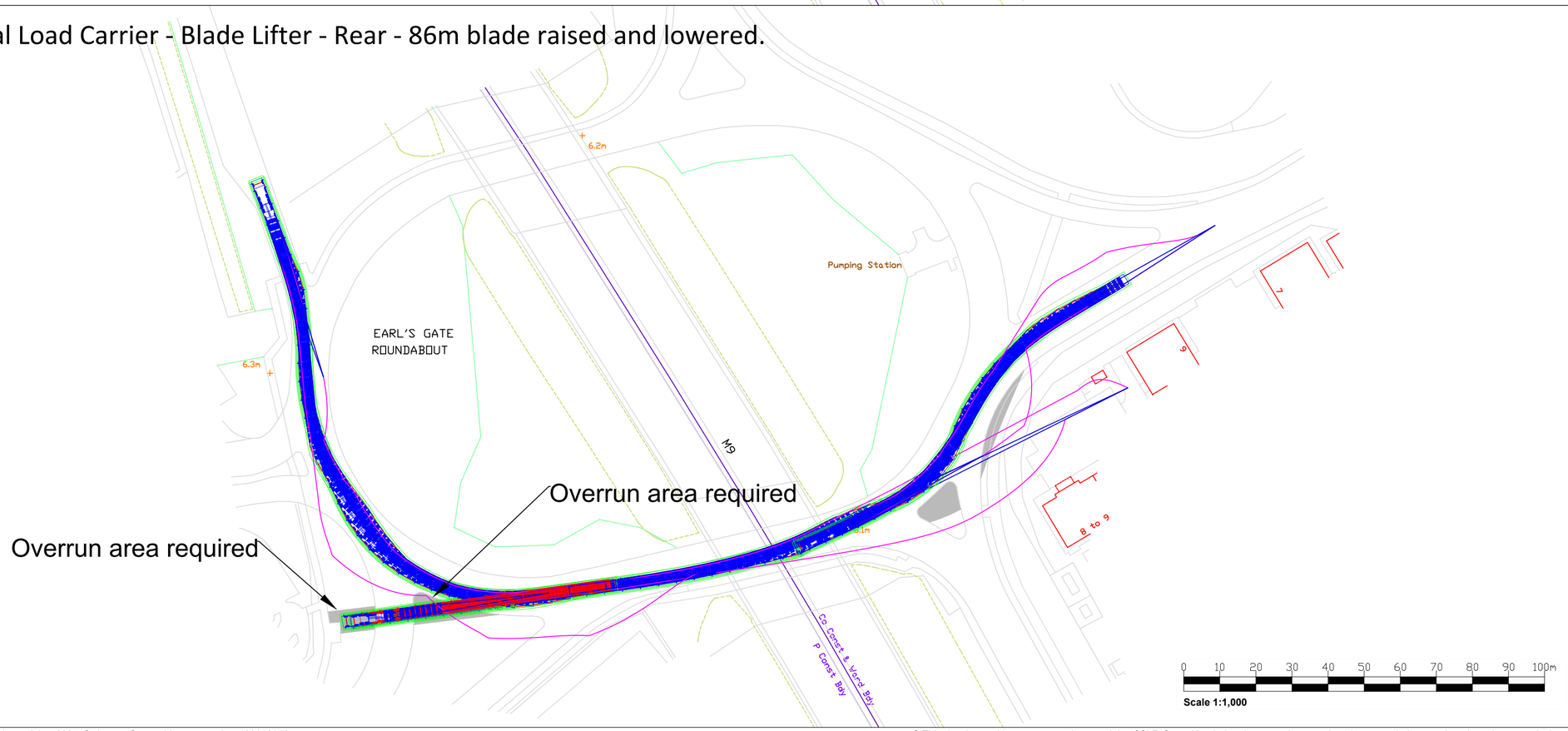
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade raised and lowered.

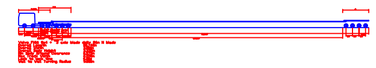


Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

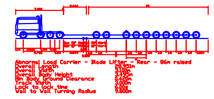
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

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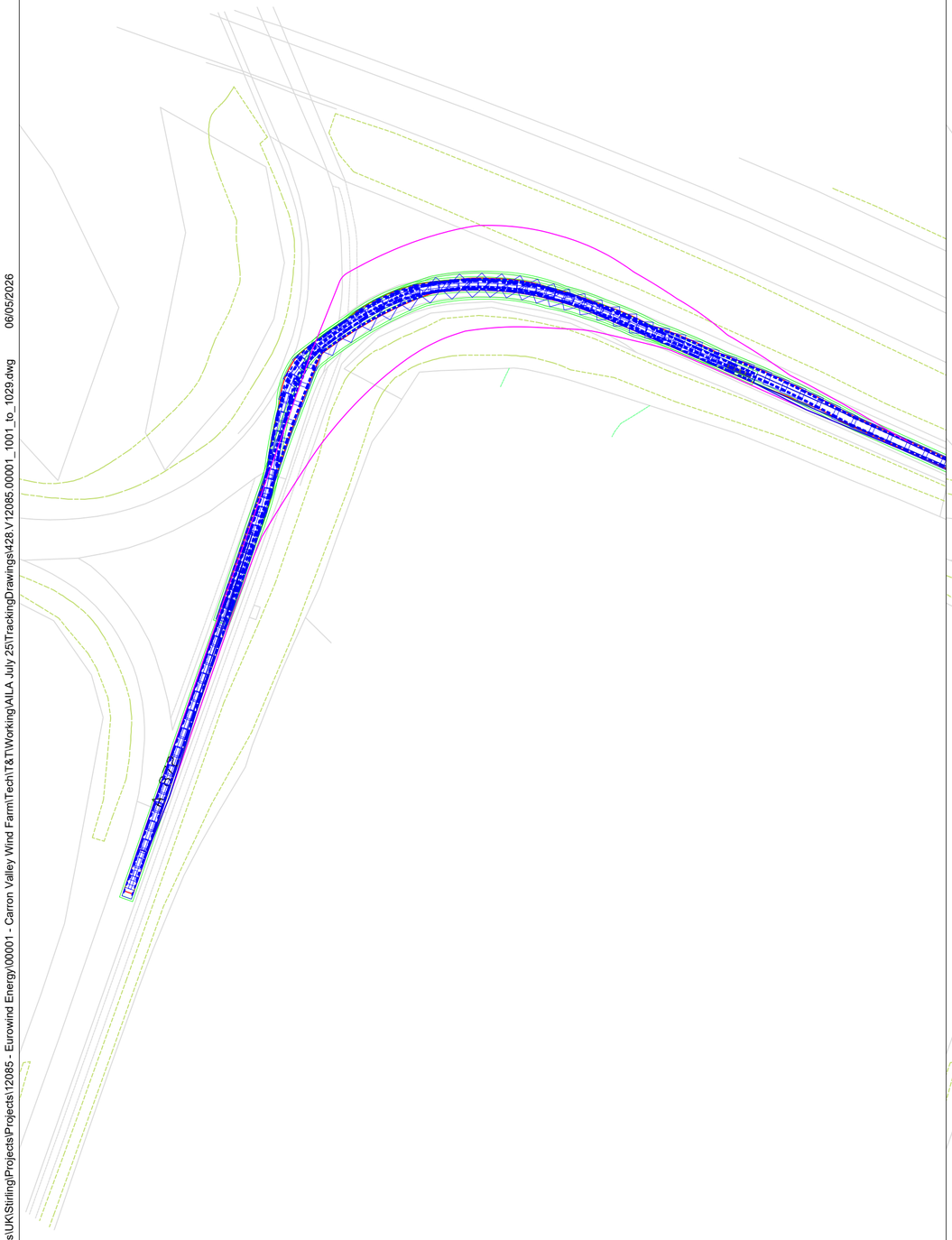
Drawing Purpose	**For information**
Suitability Code	
Client	Eurowind Energy
Project	Cairnoch Hill Wind Farm
Drawing Title	Swept Path Analysis - Pinch Point 002 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter
Scale	1:1000 @ A2
SLR Project No.	428.V12085.00001
Designed / Drawn / Checked / Authorised	GK / GK / IL / IL
Date	May 2026
Drawing Number	**428.V12085.00001_1003**
Rev.	

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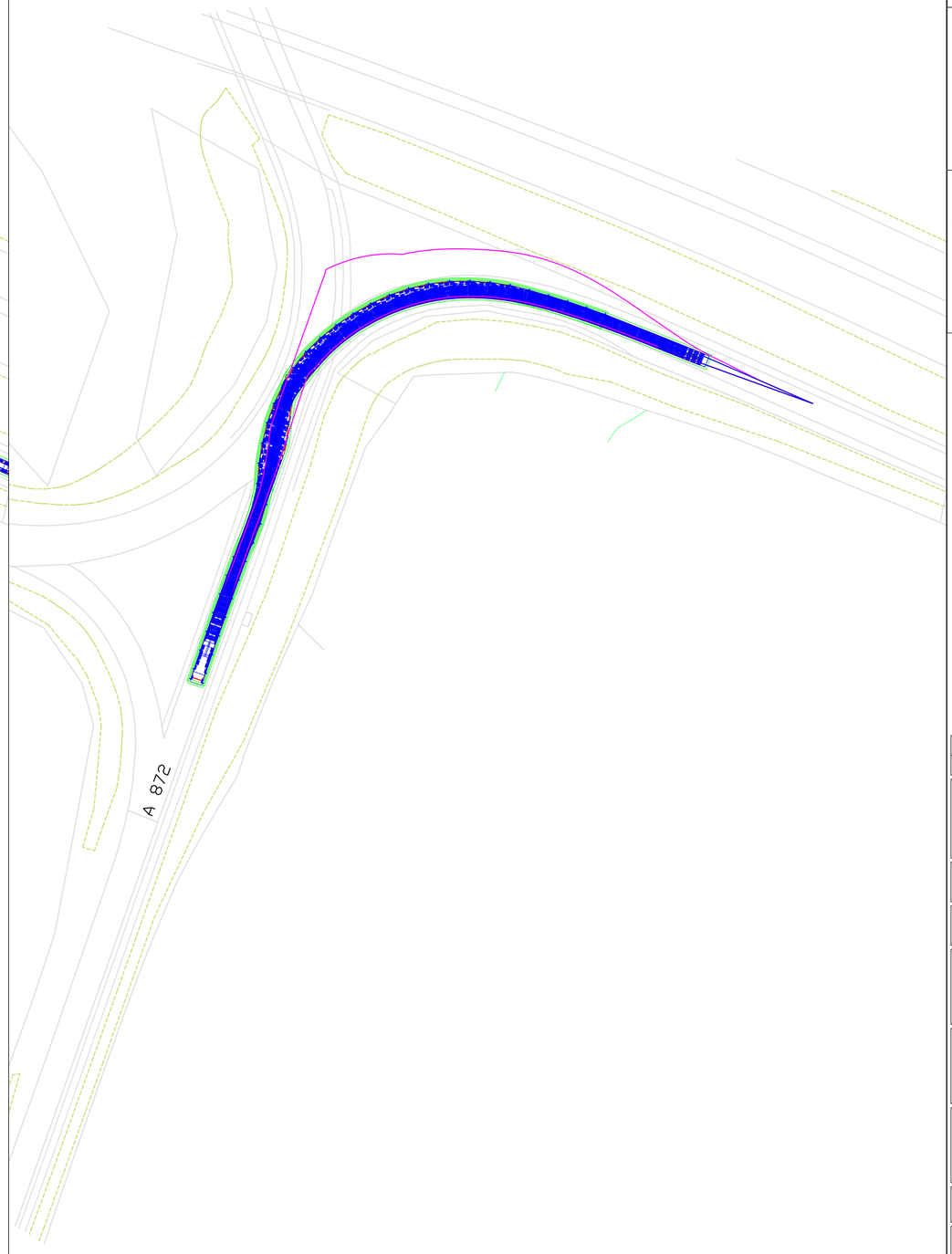
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 10 20 30 40 50 60 70 80 90 100m

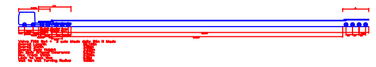
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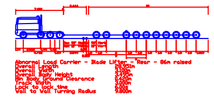
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear 86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 003
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:1000 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1004**

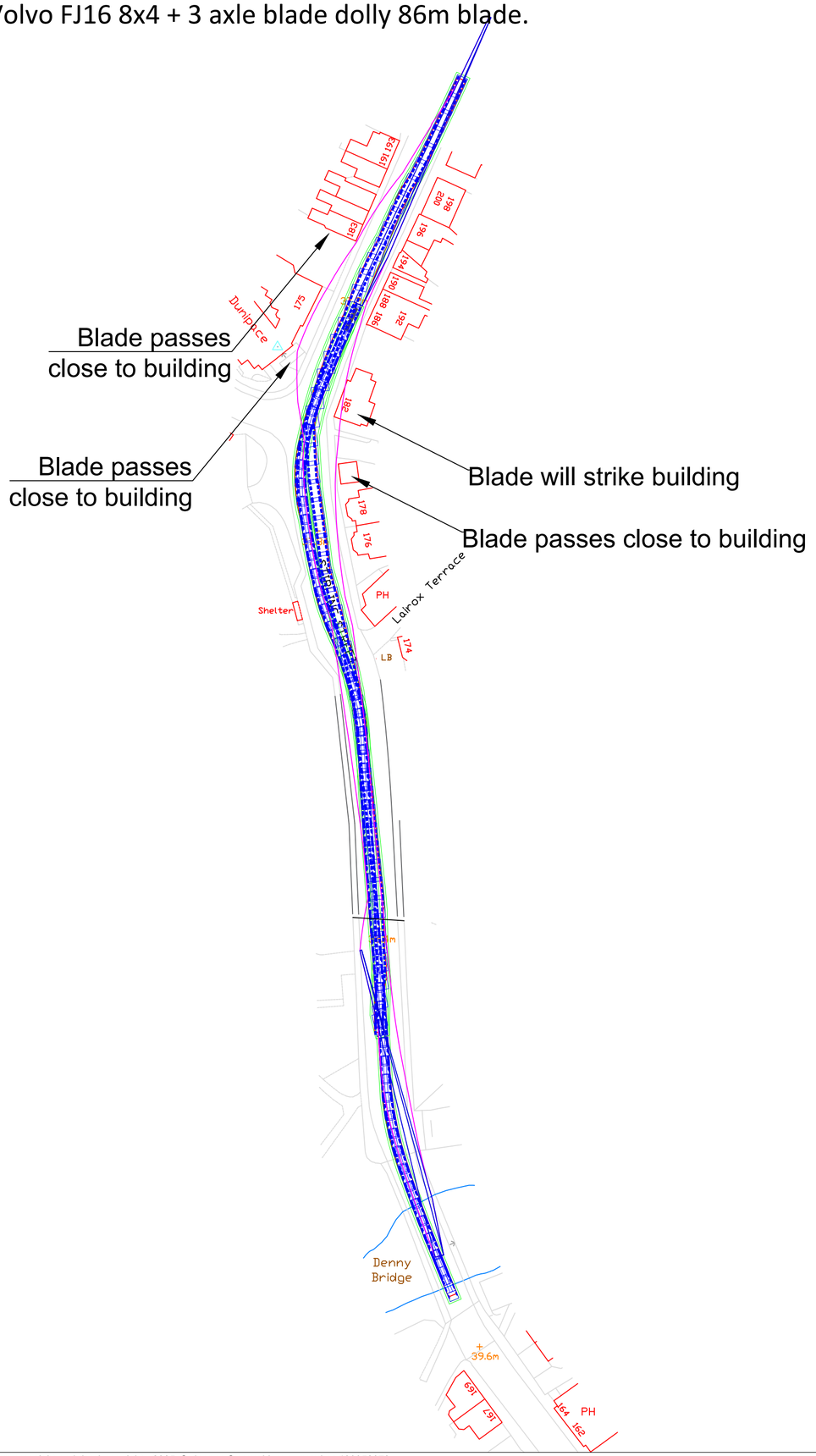
Rev.

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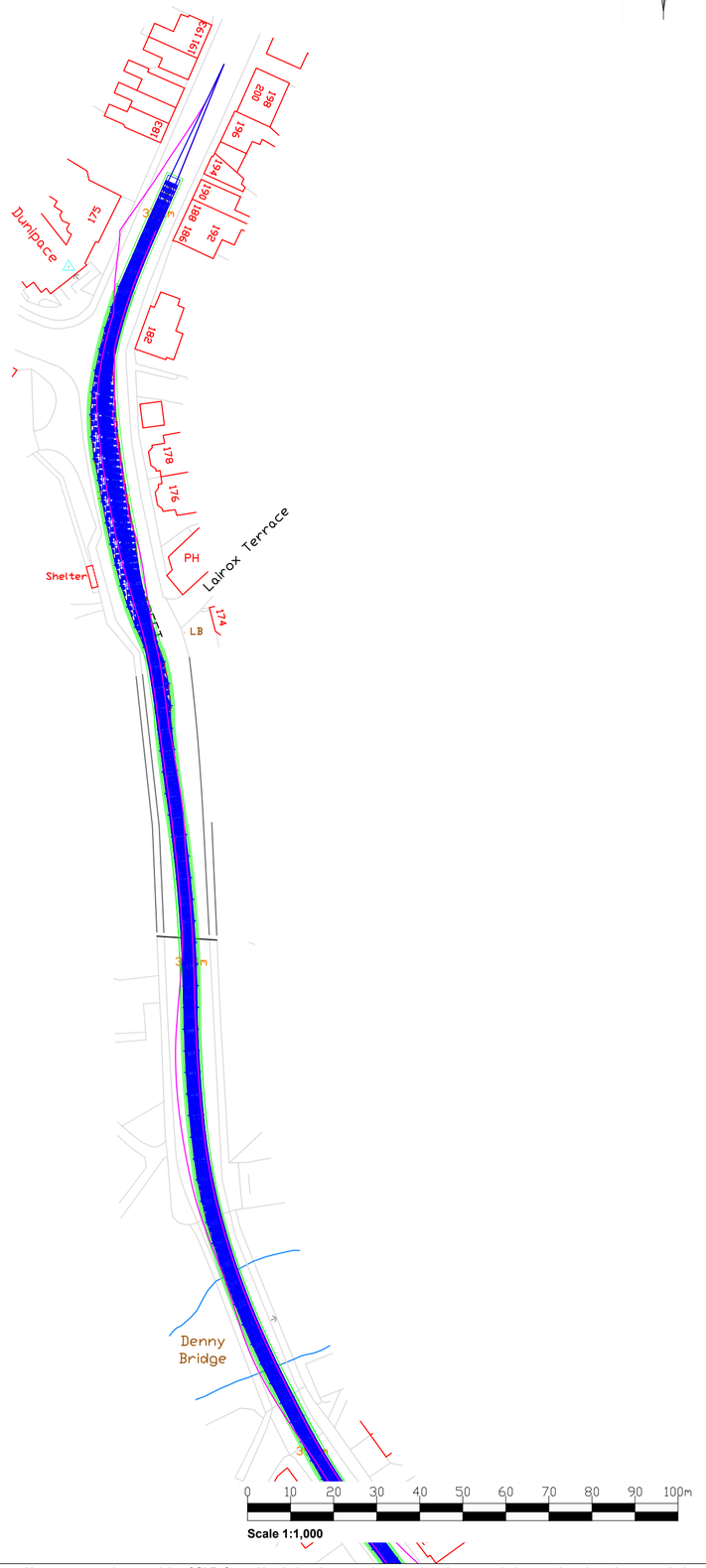
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

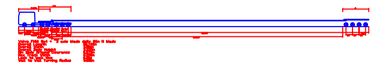


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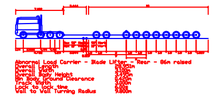
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear 86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

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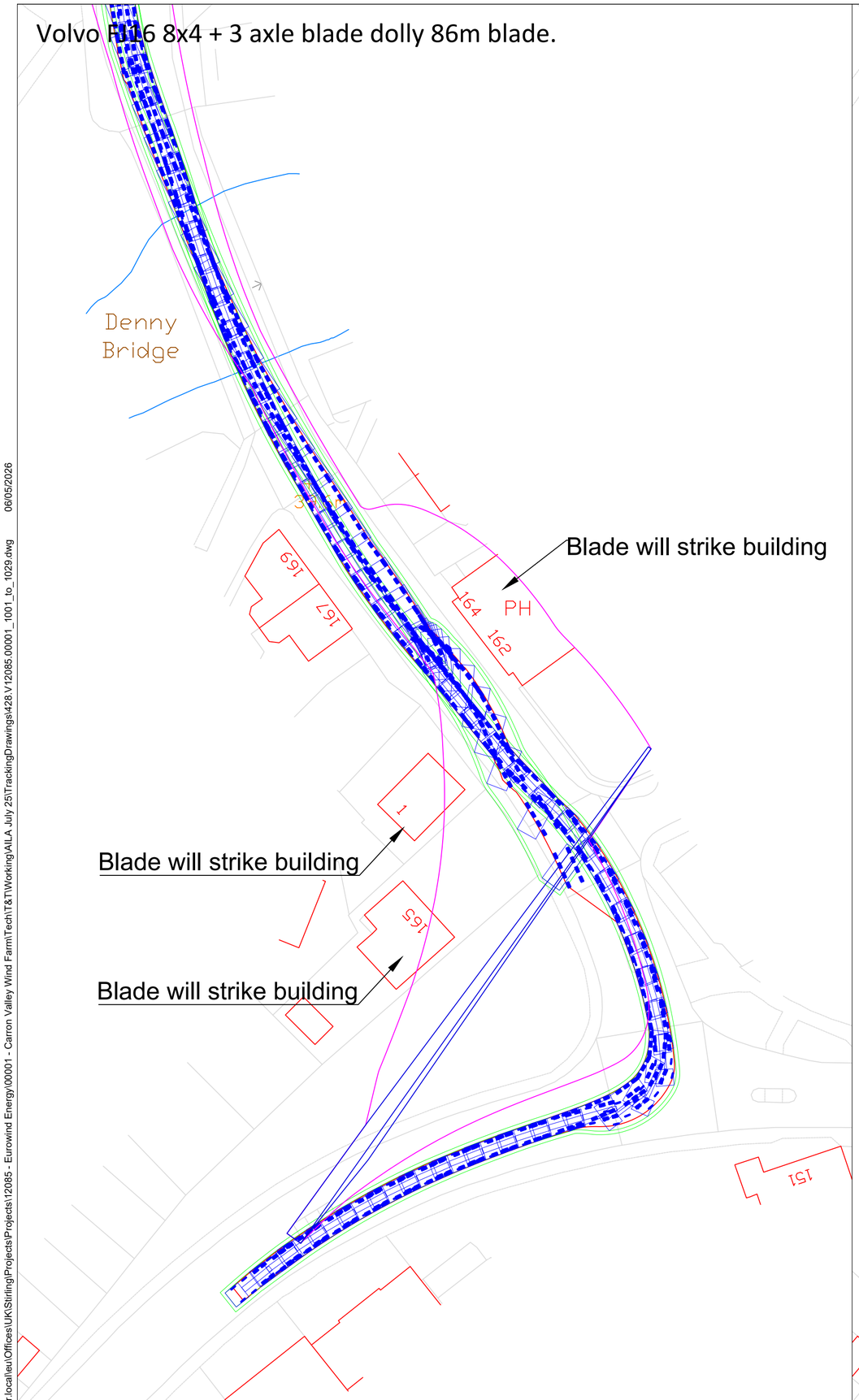
Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 004 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:1000 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Drawn: GK / Checked: IL / Authorised: IL	
Date: May 2026 / Date: May 2026 / Date: May 2026 / Date: May 2026	
Drawing Number: **428.V12085.00001_1005**	Rev.

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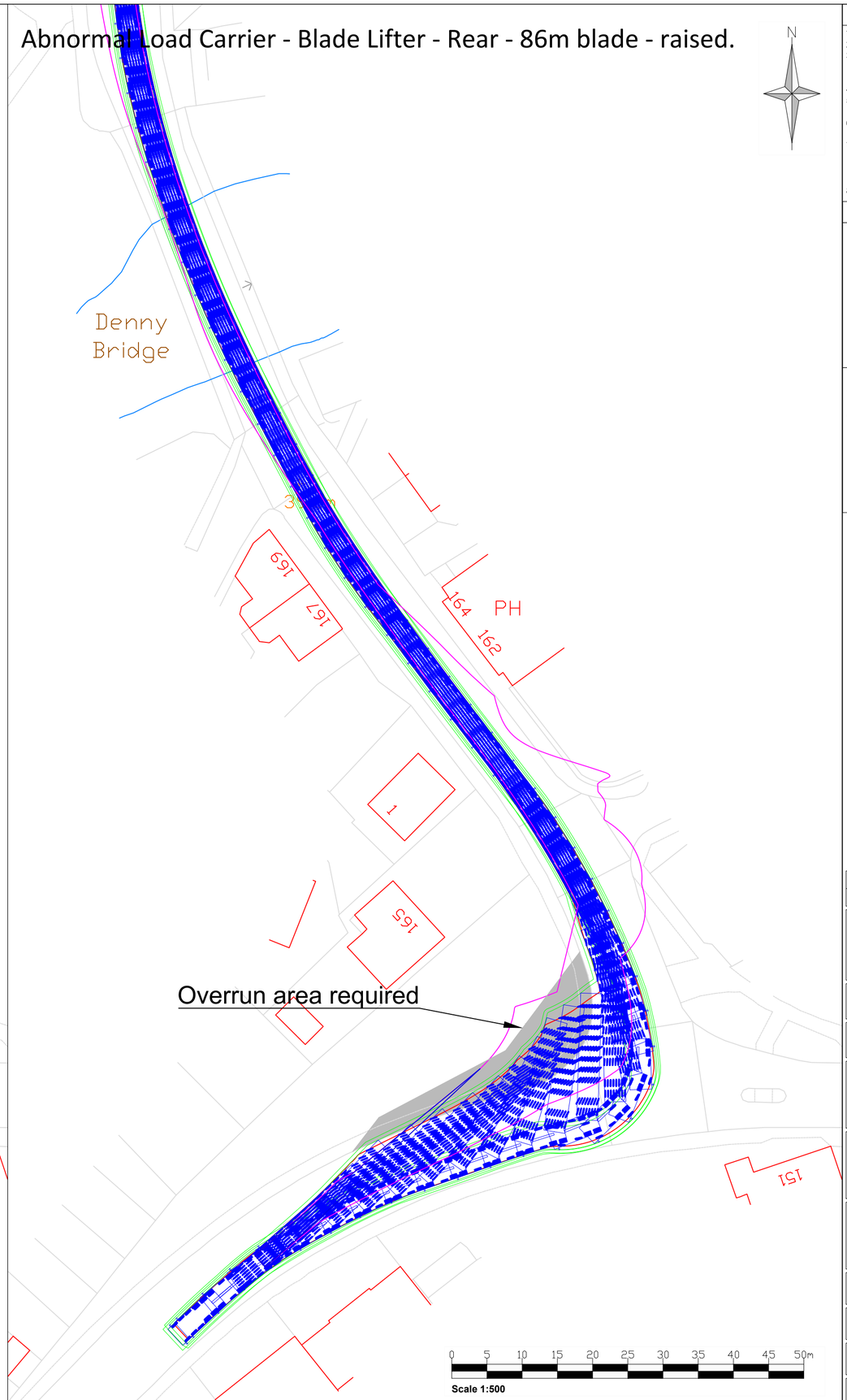
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

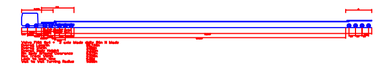


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8. SPA has been undertaken utilising manual rear wheel steering.

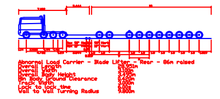
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

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Drawing Purpose	Suitability Code
For information	

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 005
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date	Date	Date	Date
May 2026	May 2026	May 2026	May 2026

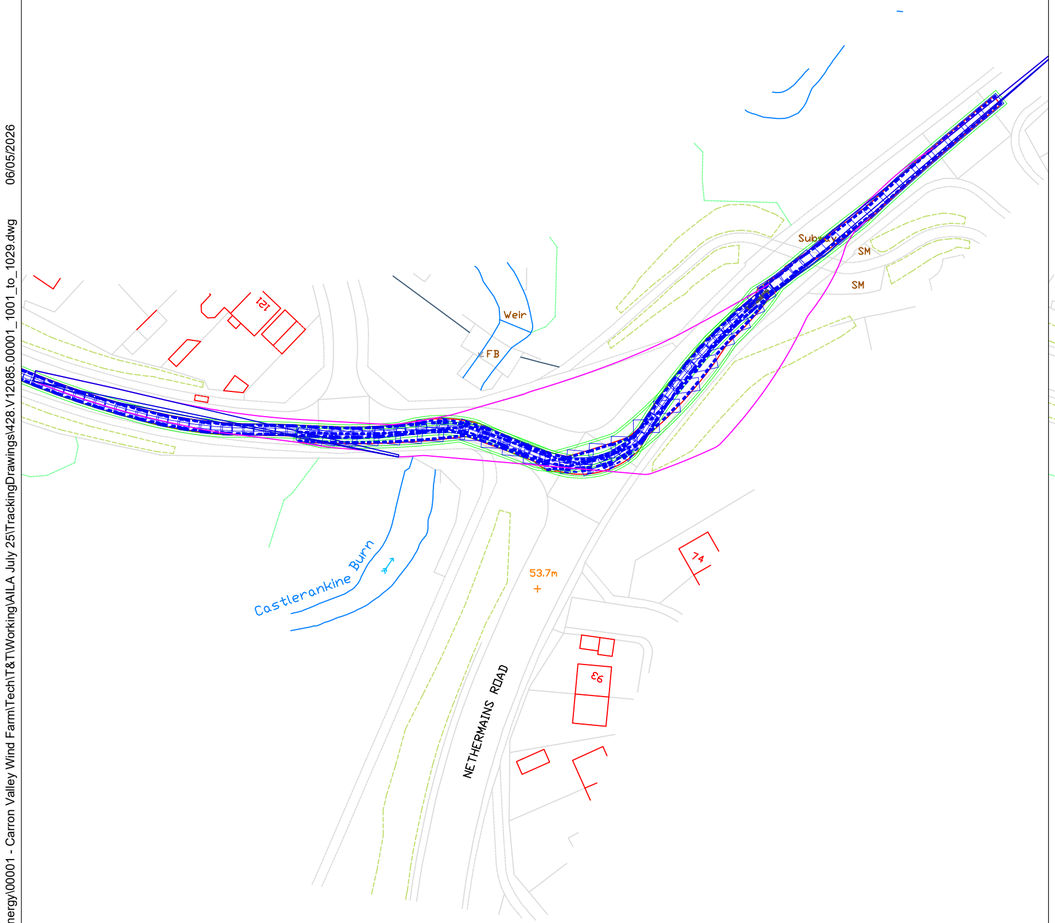
Drawing Number: **428.V12085.00001_1006** Rev.

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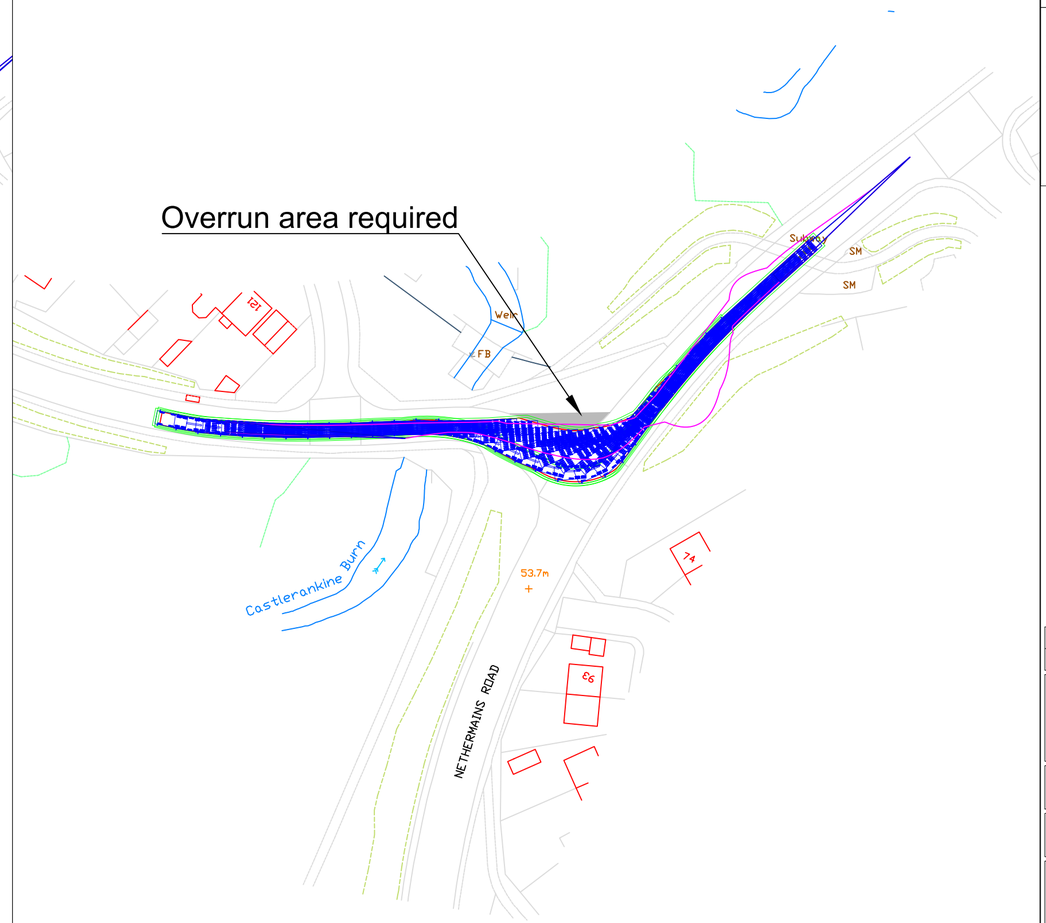
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 10 20 30 40 50 60 70 80 90 100m

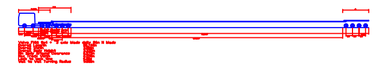
Scale 1:1,000

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8. SPA has been undertaken utilising manual rear wheel steering.

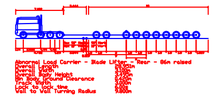
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 006
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:1000 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date	Date	Date	Date
May 2026	May 2026	May 2026	May 2026

Drawing Number: **428.V12085.00001_1007**

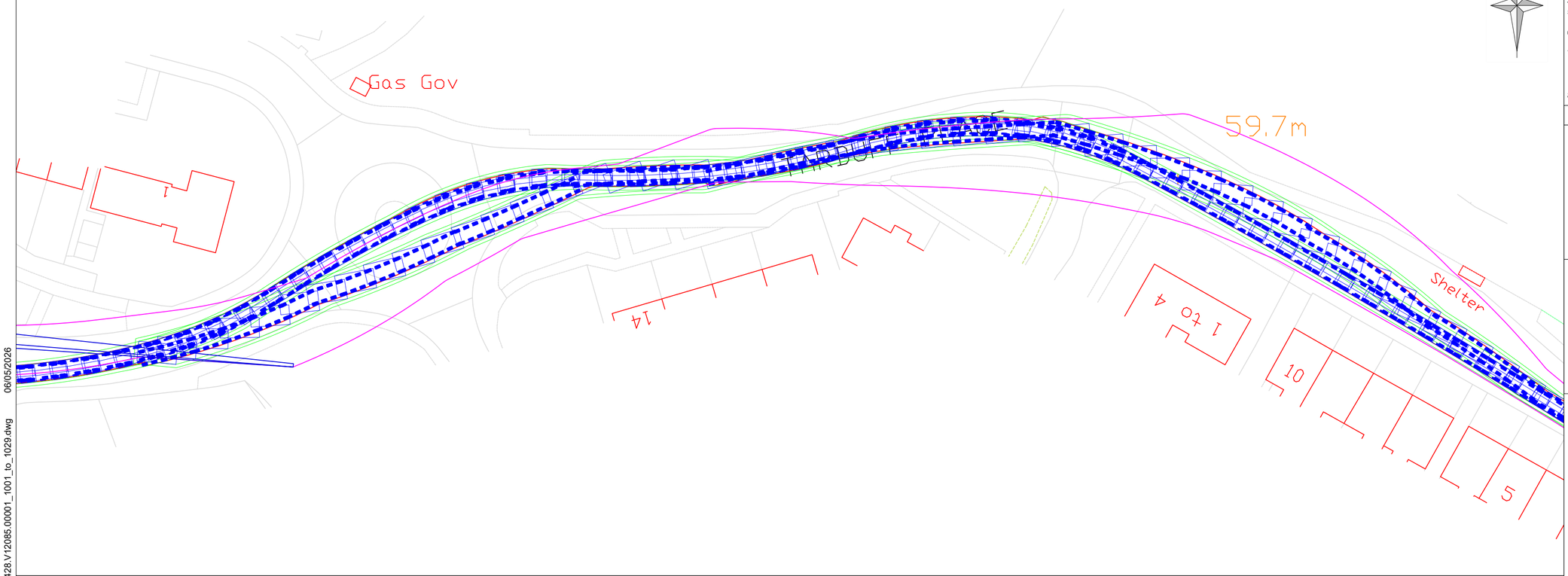
Rev.

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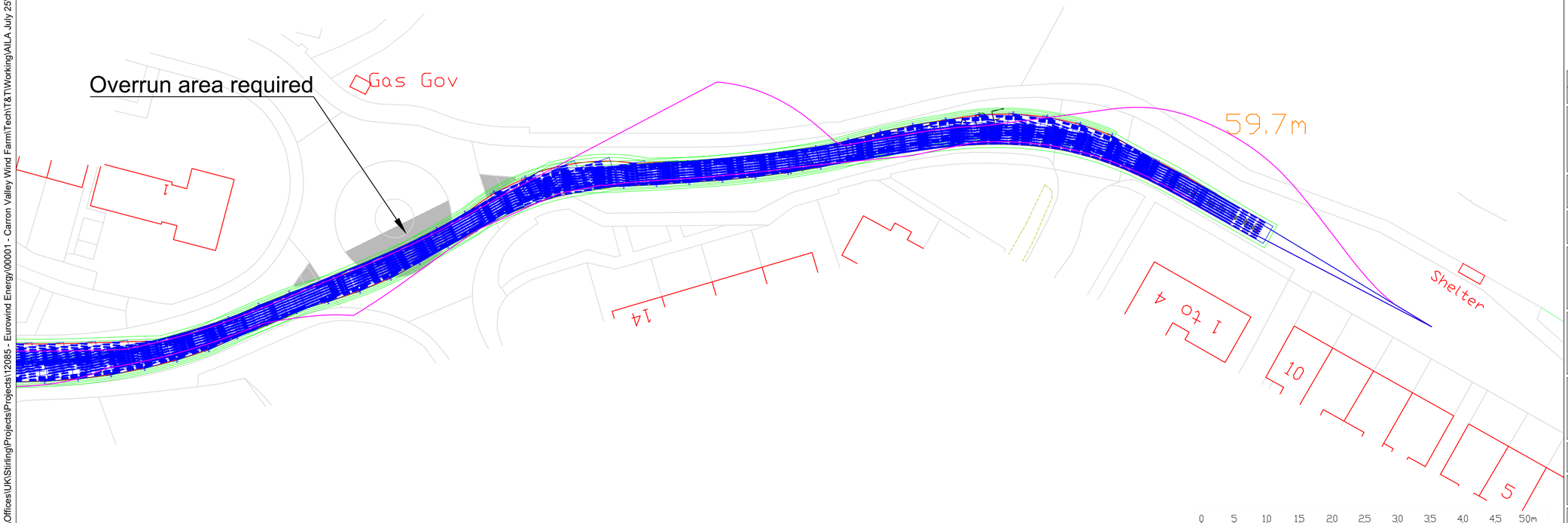
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

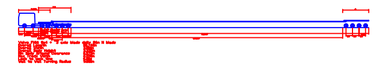


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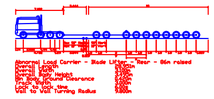
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear 86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

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Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 007 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:500 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Date: May 2026	Drawn: GK / Date: May 2026
Checked: IL / Date: May 2026	Authorised: IL / Date: May 2026
Drawing Number: **428.V12085.00001_1008**	Rev.

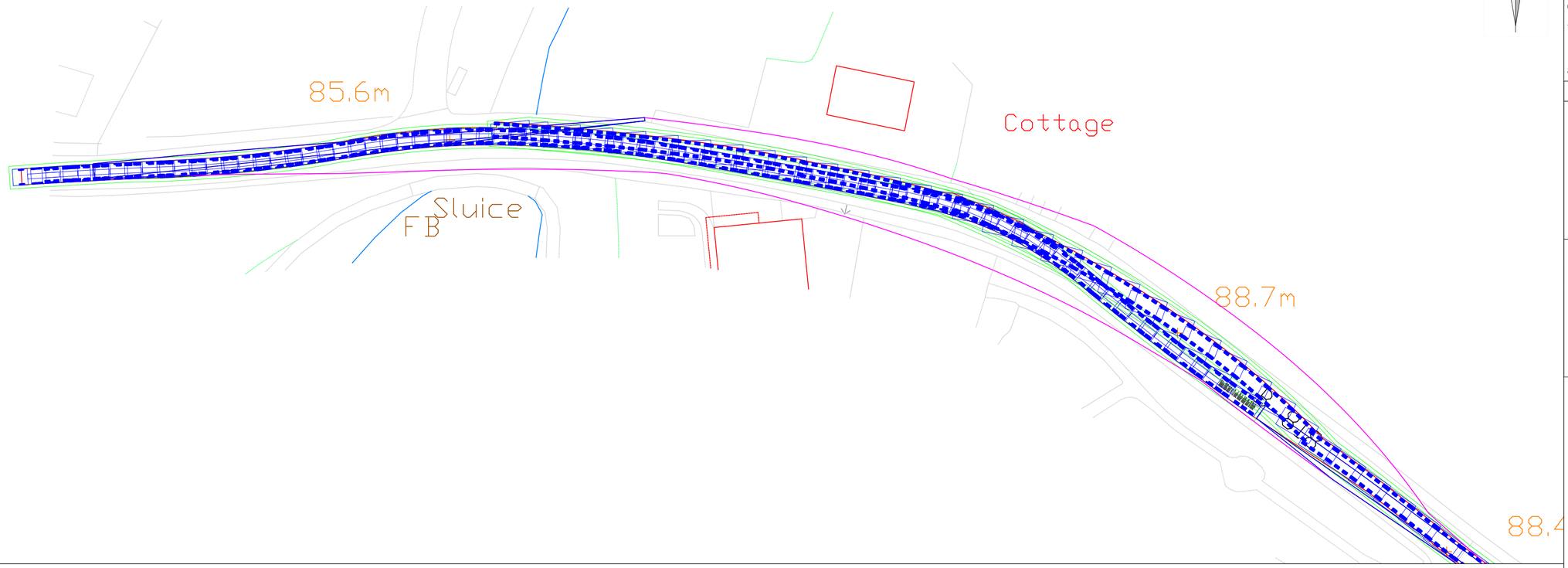
06/05/2026

\\slr.local\eu\Offices\UK\StirlingProjects\Projects\12085 - Eurowind Energy\00001 - Carron Valley Wind Farm\Tech\T&T\Working\AILA July 25\TrackingDrawings\428.V12085.00001_1001_to_1029.dwg

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

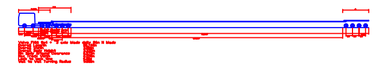


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8. SPA has been undertaken utilising manual rear wheel steering.

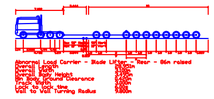
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 008
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1009**

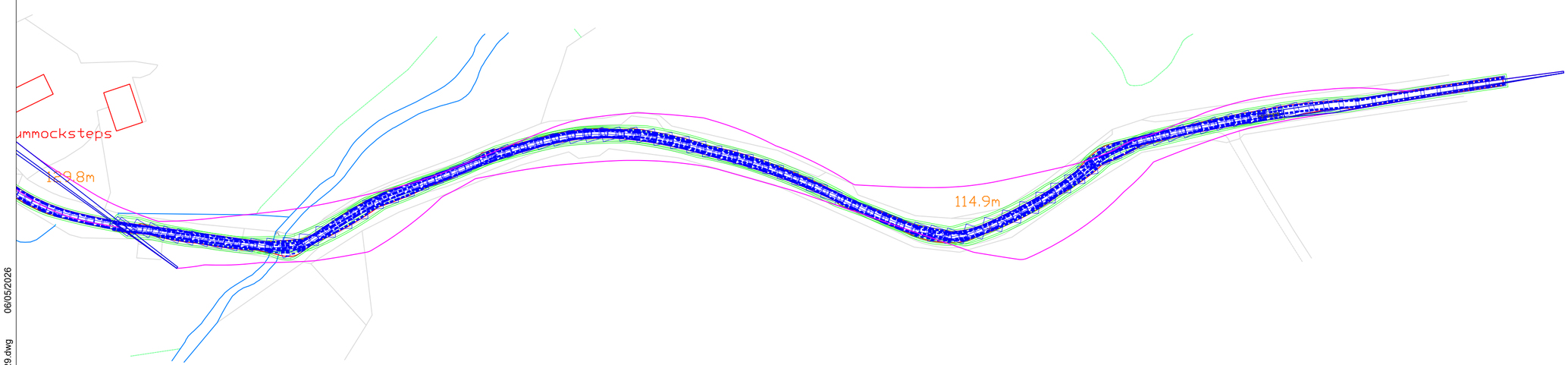
Rev.:

\\slr.local\eu\Offices\UK\Stirling\Projects\12085 - Eurowind Energy\00001 - Carron Valley Wind Farm\Tech\T&T\Working\AILA July 25\TrackingDrawings\428.V12085.00001_1001_to_1029.dwg 06/05/2026

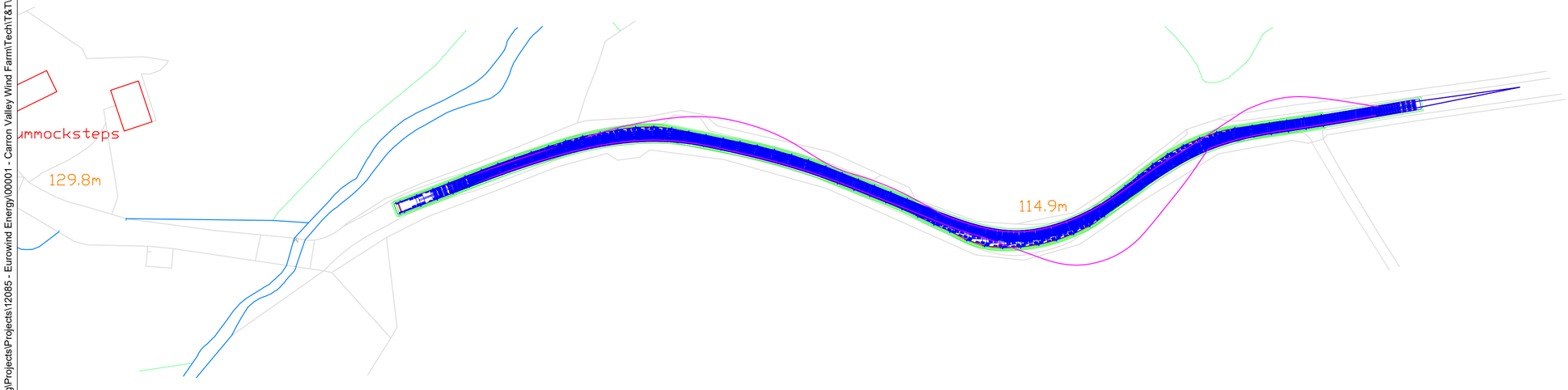
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 10 20 30 40 50 60 70 80 90 100m

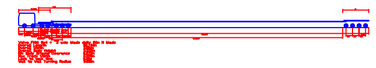
Scale 1:1,000

Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

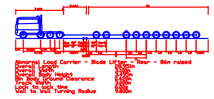
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

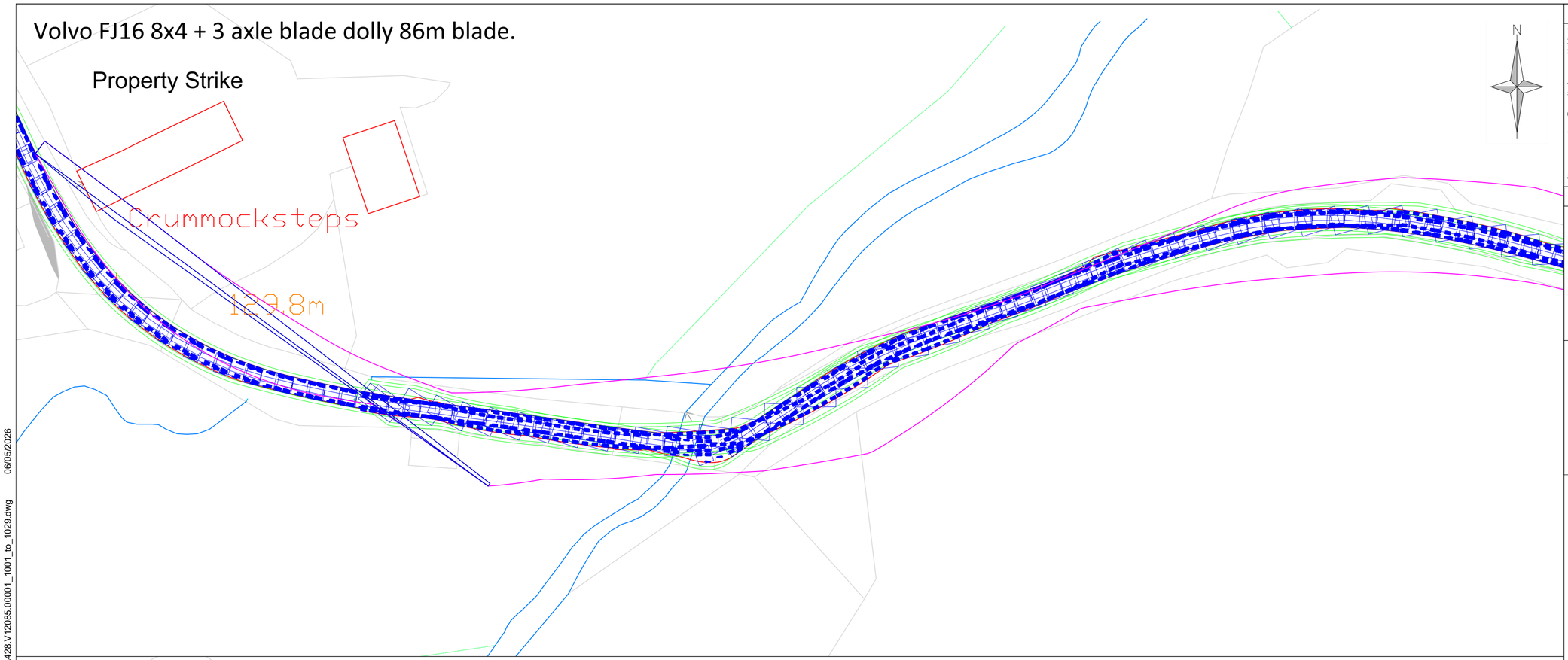
Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 009 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:1000 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Date: May 2026	Drawn: GK / Date: May 2026
Checked: IL / Date: May 2026	Authorised: IL / Date: May 2026
Drawing Number: **428.V12085.00001_1010**	Rev.

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 5 10 15 20 25 30 35 40 45 50m

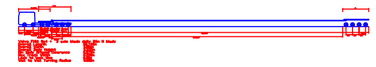
Scale 1:500

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8. SPA has been undertaken utilising manual rear wheel steering.

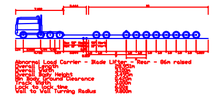
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 010
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1011**

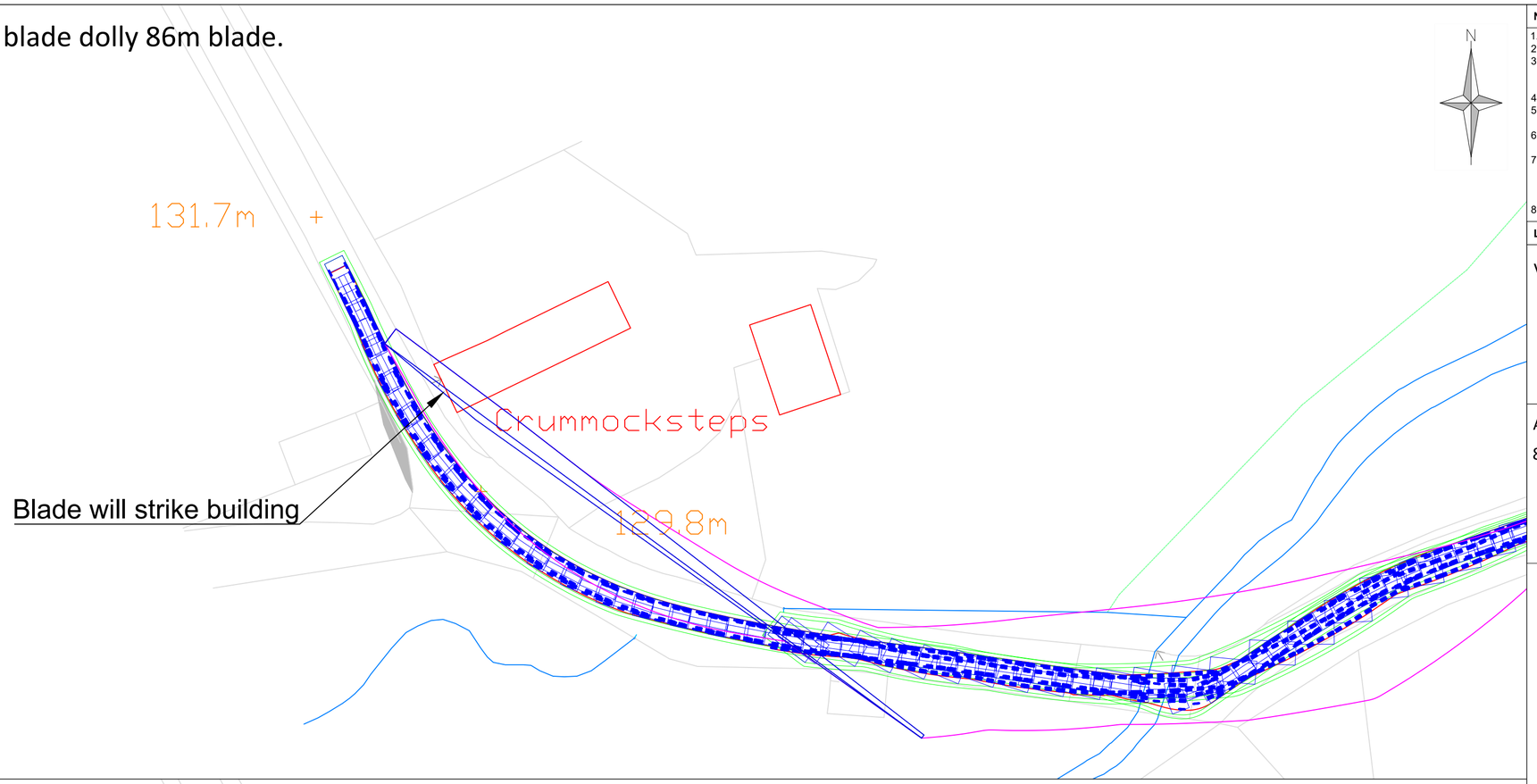
Rev.:

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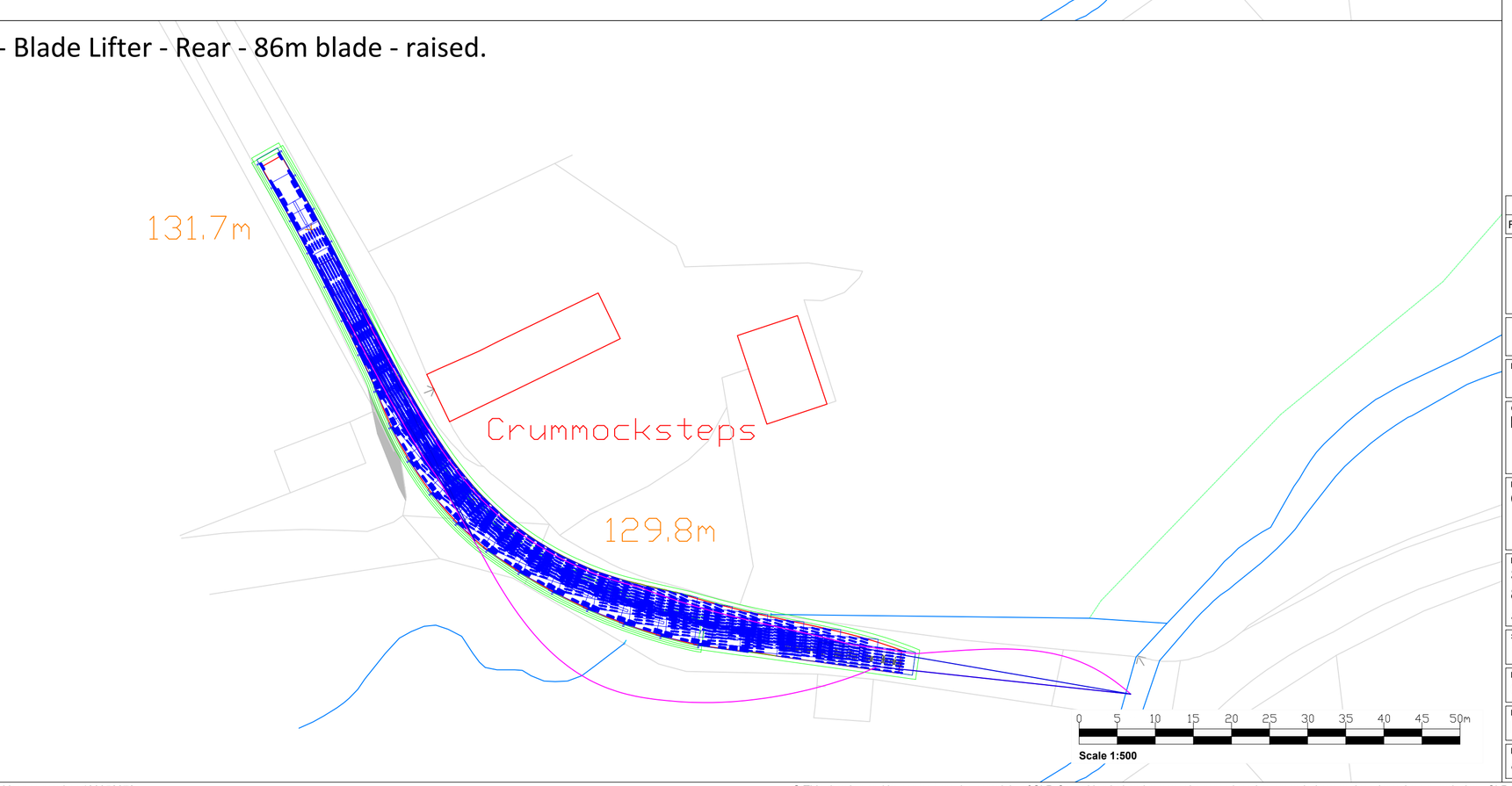
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

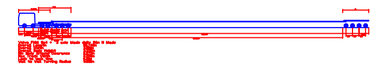


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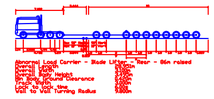
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

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Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 011 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:500 @ A2	SLR Project No.: 428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

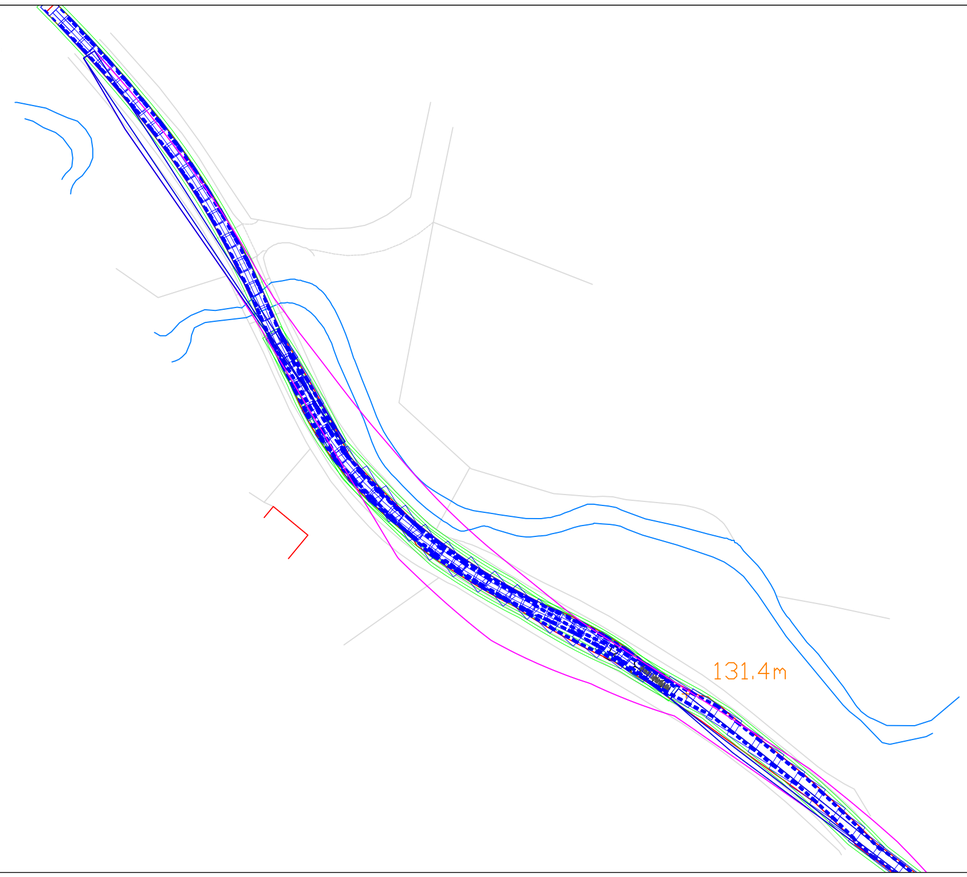
Drawing Number: **428.V12085.00001_1012** Rev.

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

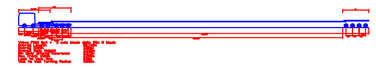


Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

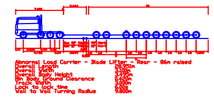
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose	Suitability Code
For information	

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 012
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number	Rev.
428.V12085.00001_1013	

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 5 10 15 20 25 30 35 40 45 50m

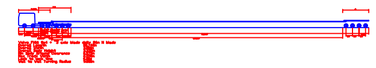
Scale 1:500

Notes:

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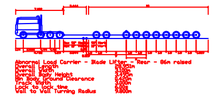
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

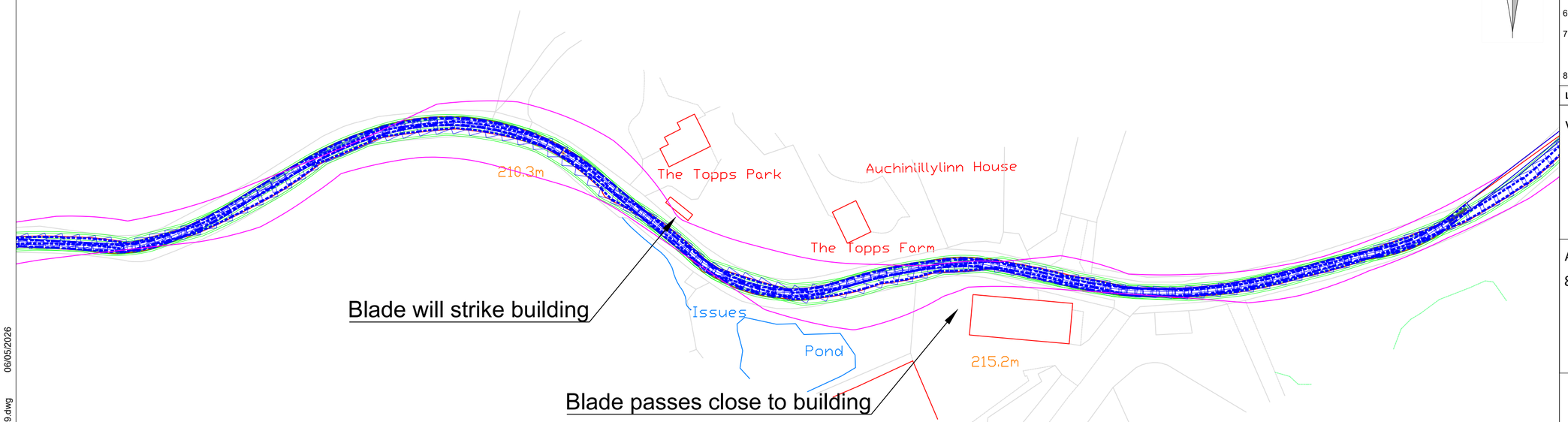
Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 013 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:500 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Drawn: GK / Checked: IL / Authorised: IL	
Date: May 2026 / Date: May 2026 / Date: May 2026 / Date: May 2026	
Drawing Number: **428.V12085.00001_1014**	Rev.

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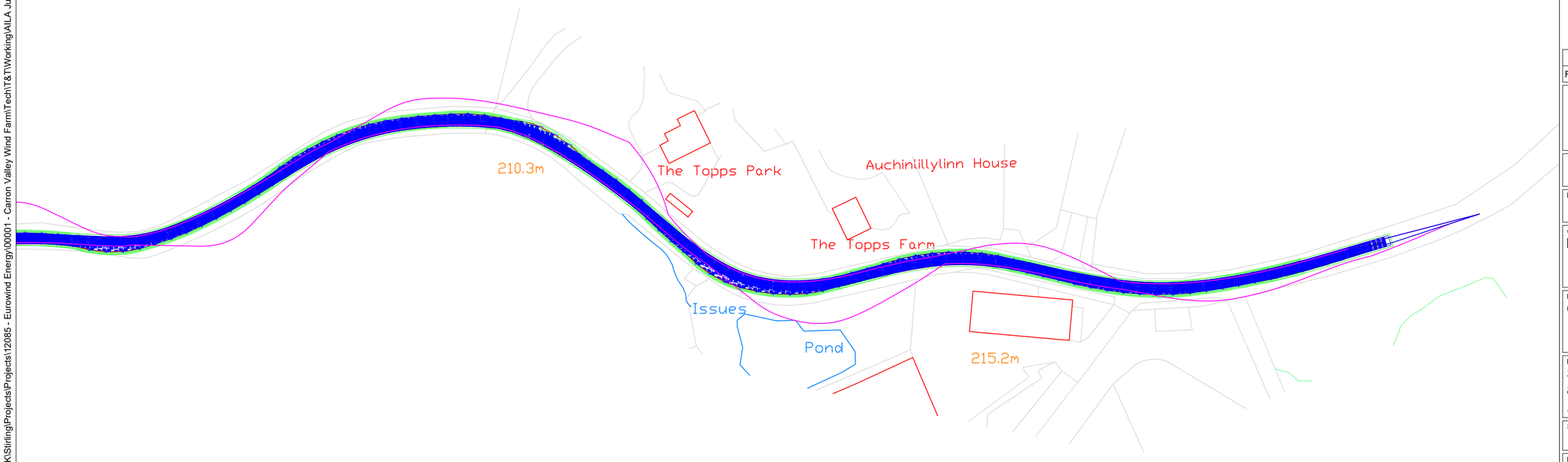
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 5 10 15 20 25 30 35 40 45 50m

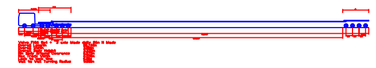
Scale 1:500

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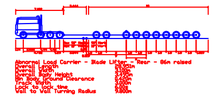
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 014
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1015**

Rev.

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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.

197.8m

Blade oversails over edge of bridge

192.6m

Very tight on stone bridge

197.8m

Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

192.6m

Very tight on stone bridge

0 5 10 15 20 25 30 35 40 45 50m

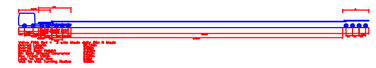
Scale 1:500

Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

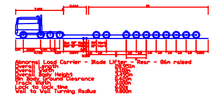
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 015
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1016**

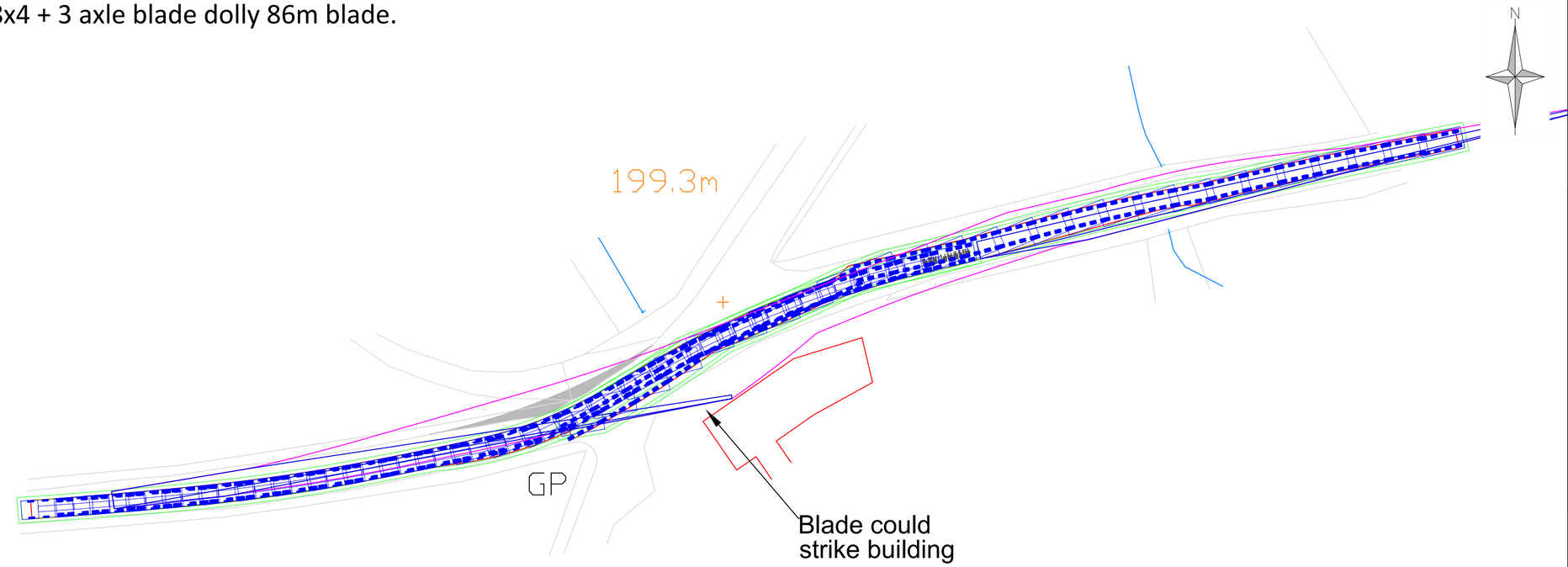
Rev.

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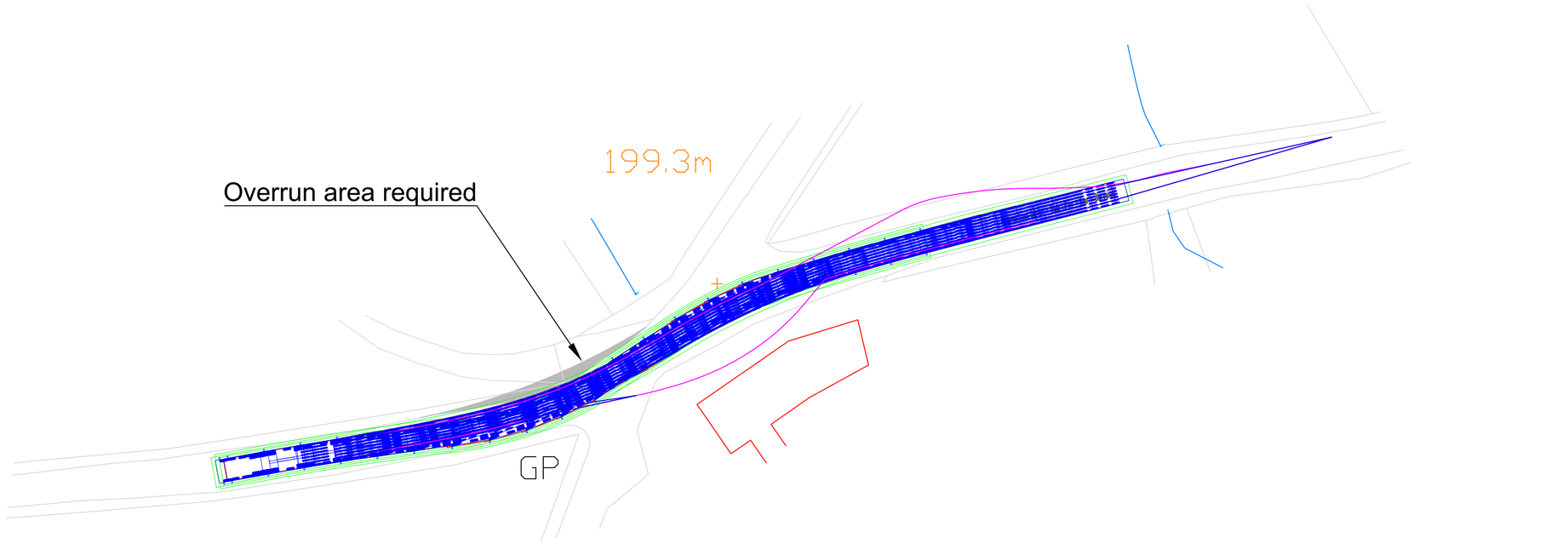
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



0 5 10 15 20 25 30 35 40 45 50m

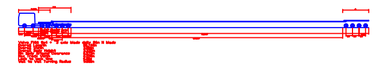
Scale 1:500

Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

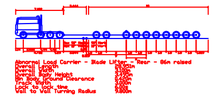
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Point 016
86m blade transported by:
AILV with a DOLL trailer, and a Blade Lifter

Scale	SLR Project No.
1:500 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1017**

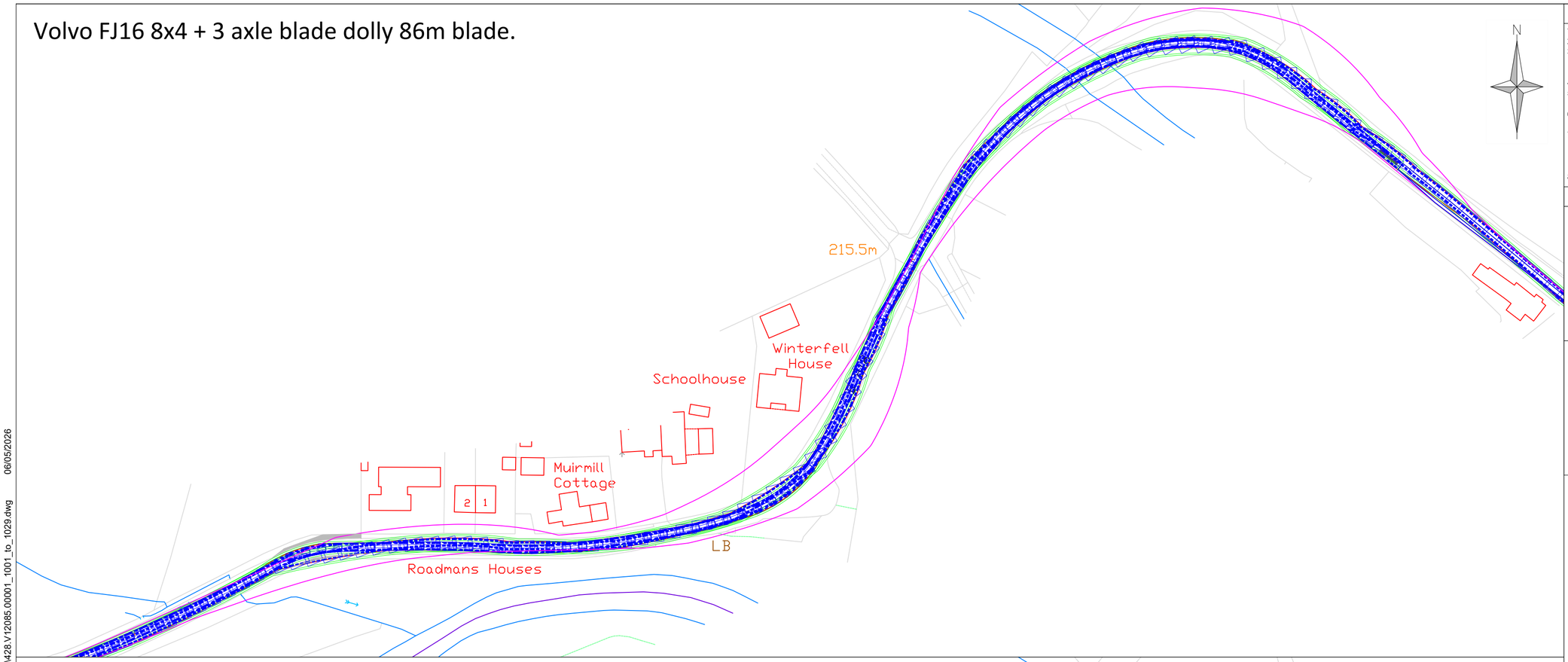
Rev.

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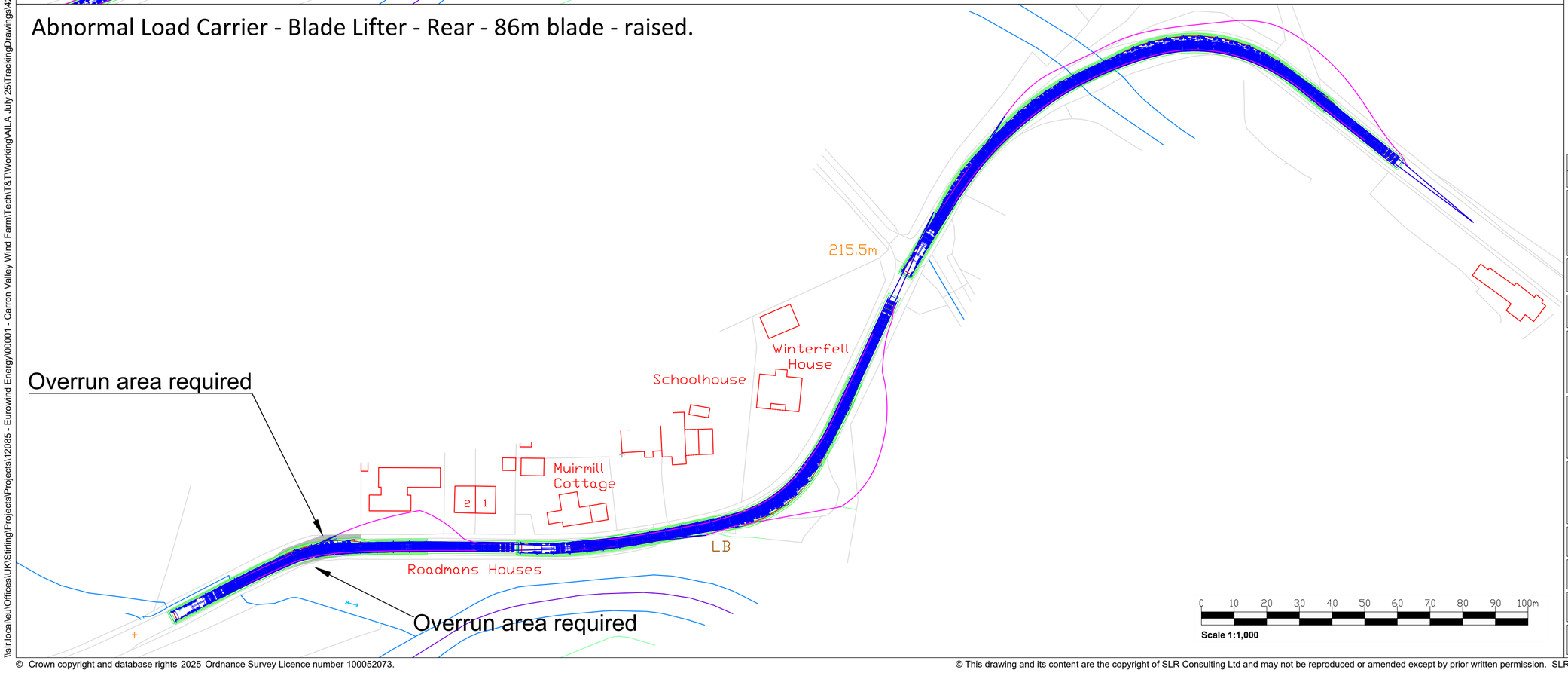
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

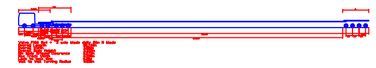


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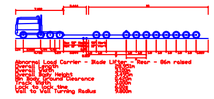
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear 86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 017 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:1000 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Date: May 2026	Drawn: GK / Date: May 2026
Checked: IL / Date: May 2026	Authorised: IL / Date: May 2026
Drawing Number: **428.V12085.00001_1018**	Rev.

0 10 20 30 40 50 60 70 80 90 100m

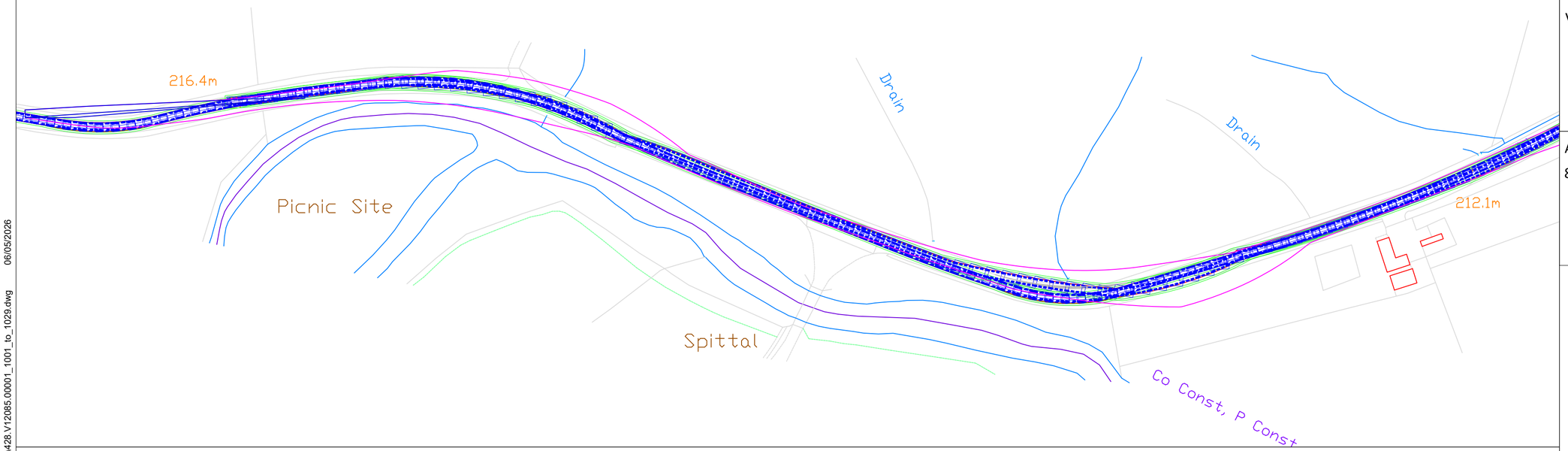
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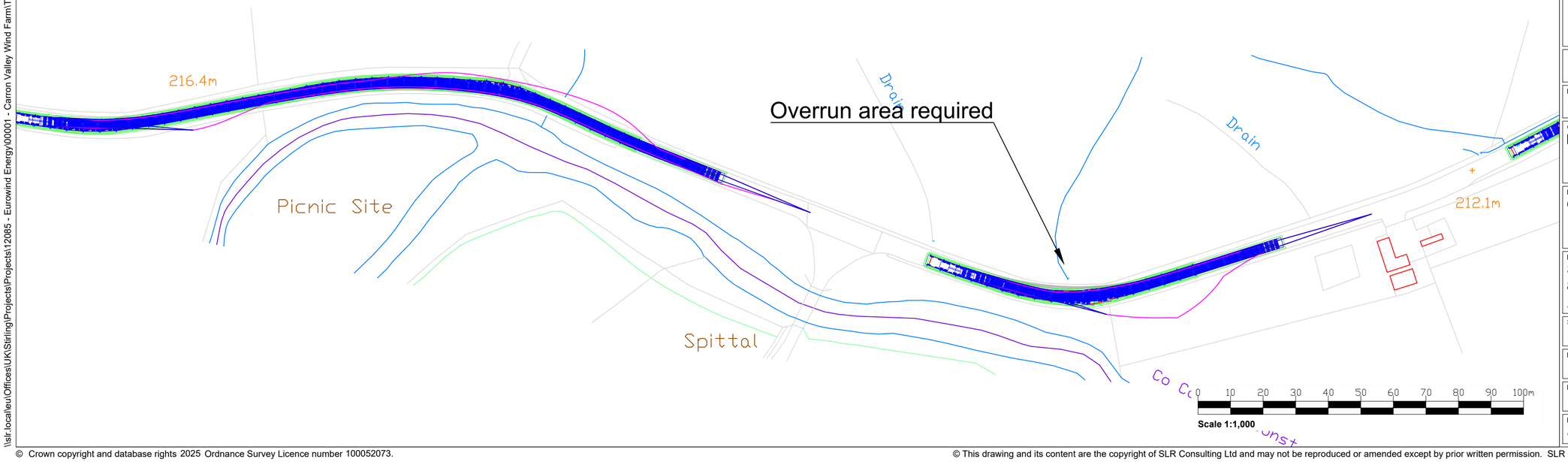
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

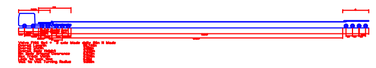


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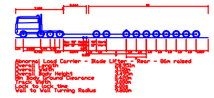
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 018 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:1000 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Drawn: GK / Checked: IL / Authorised: IL	
Date: May 2026 / Date: May 2026 / Date: May 2026 / Date: May 2026	
Drawing Number: **428.V12085.00001_1019**	Rev.

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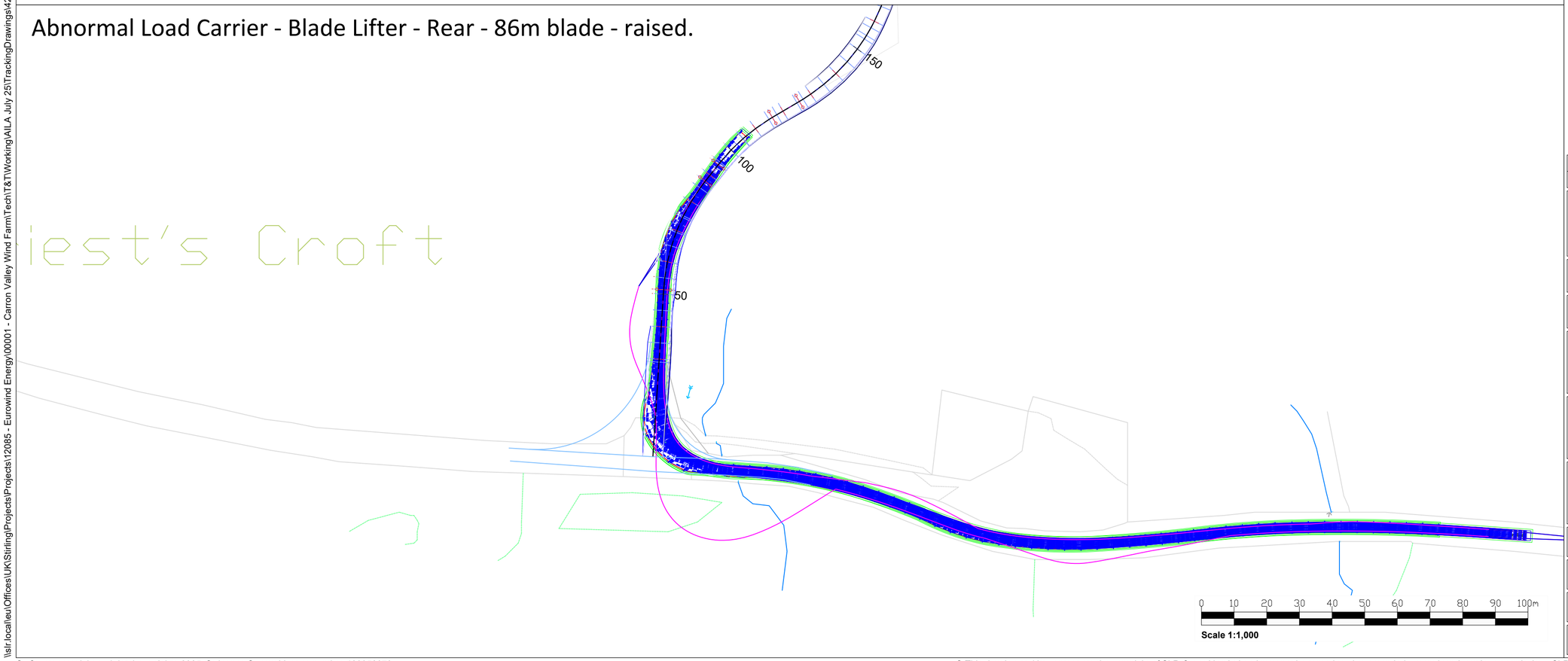
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Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear - 86m blade - raised.

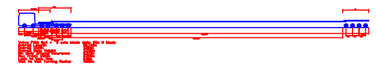


Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

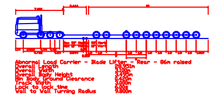
Legend:

Volvo FJ16 8x4 + 3 axle blade dolly 86m blade.



Abnormal Load Carrier - Blade Lifter - Rear

86m blade - raised.



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Blade outline

Rev	Amendments	Date	By	Chk	Auth

SLR

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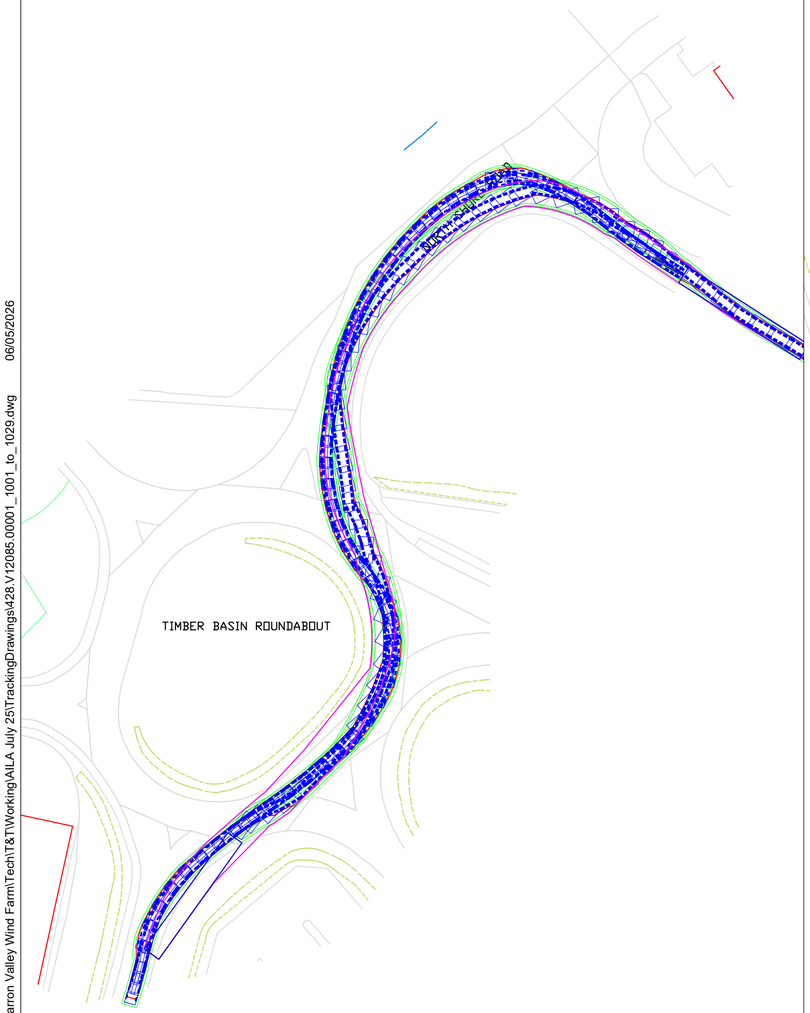
Drawing Purpose: **For information**	Suitability Code:
Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Point 019 86m blade transported by: AILV with a DOLL trailer, and a Blade Lifter	
Scale: 1:1000 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Date: May 2026	Drawn: GK / Date: May 2026
Checked: IL / Date: May 2026	Authorised: IL / Date: May 2026
Drawing Number: **428.V12085.00001_1020**	Rev.

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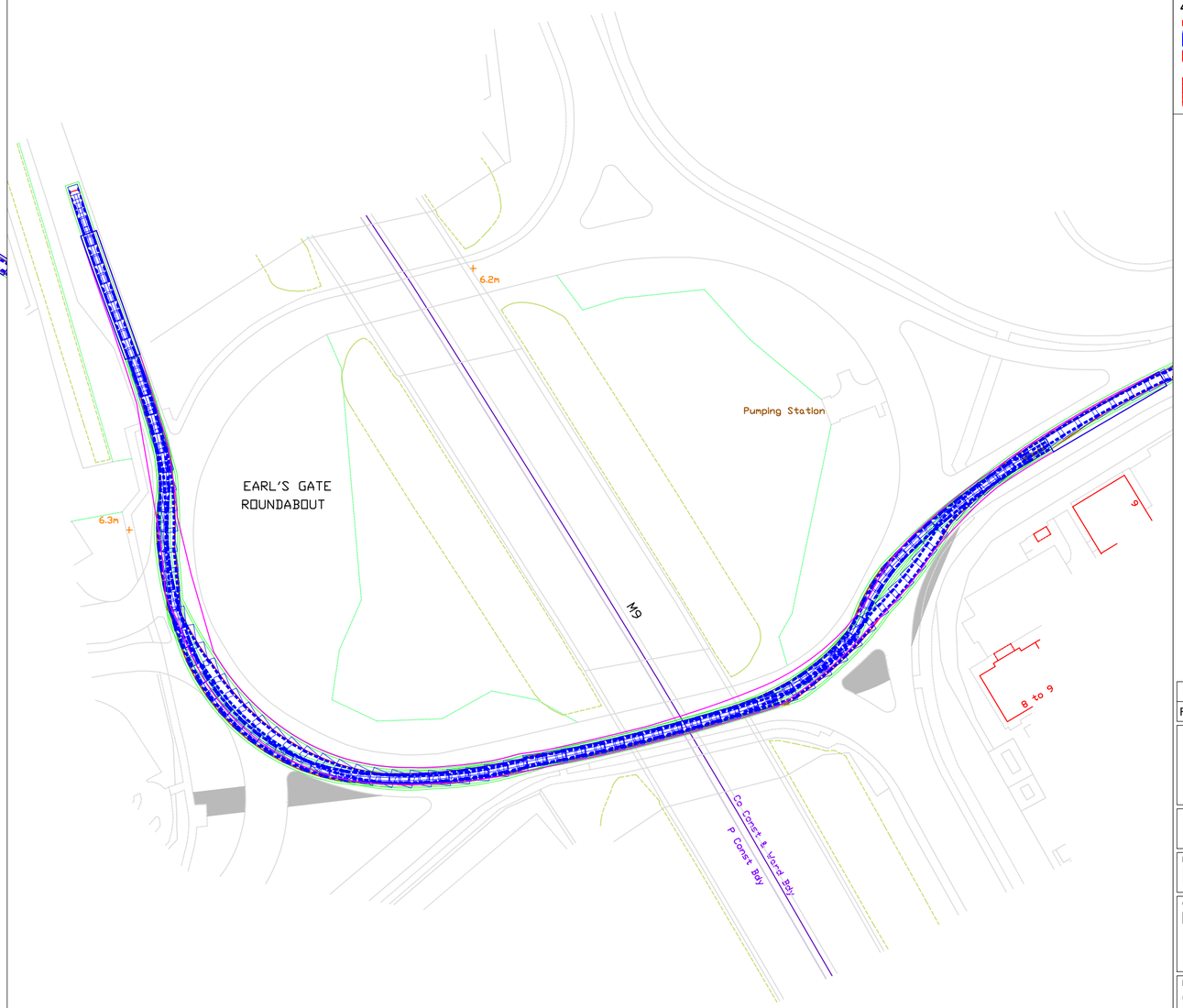
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



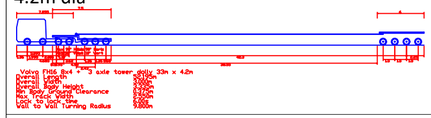
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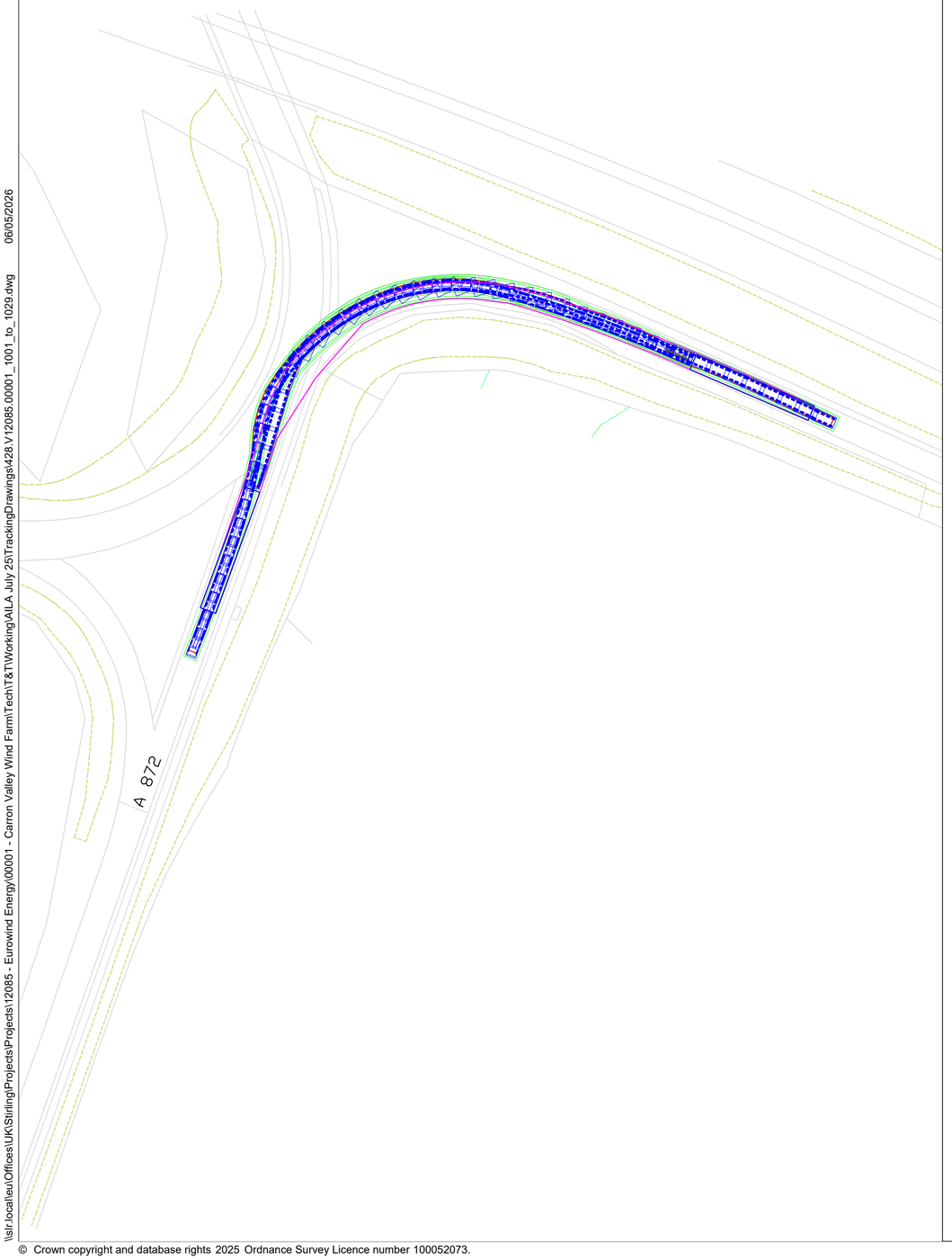
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7. Swept Path has been assessed on a 33m long, 4.2m dia tower section, which is modelled on a Tower Transporter with a 4 axle tractor unit and a rear bogie with 3 axles which are all capable of steering.
8. SPA has been undertaken utilising manual rear wheel steering.

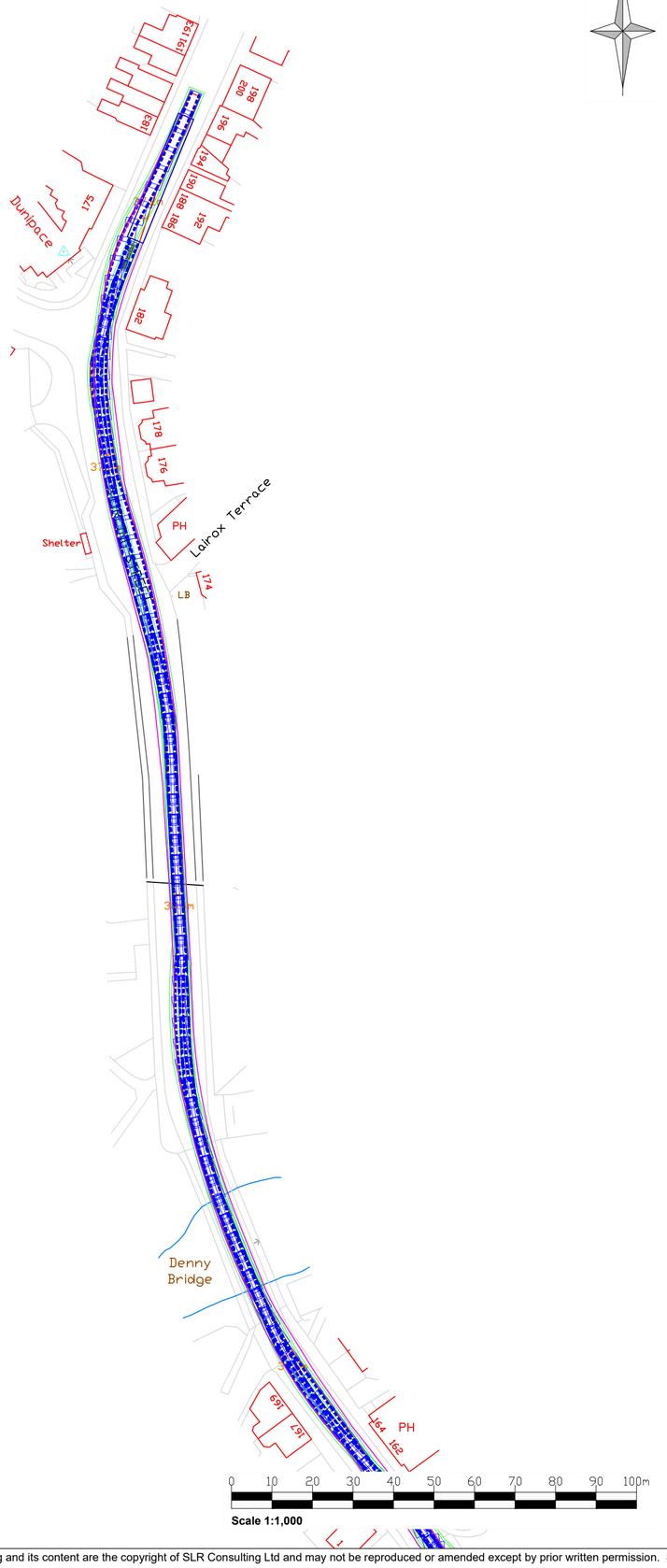
Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia


Volvo FH16 8x4 + 3 axle tower dolly 33m x 4.2m
Overall Length 33000m
Overall Body Height 4200m
Rear Body Ground Clearance 1250m
Max Tyre Width 385mm
Kingpin to Rear Axle 9000m
Kingpin to Mid Axle 8000m
Kingpin to Front Axle 1300m
Kingpin to Rear Bogie 1300m
Kingpin to Front Bogie 1300m
Kingpin to Tail 1300m
Kingpin to Front Axle 1300m
Kingpin to Rear Axle

Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



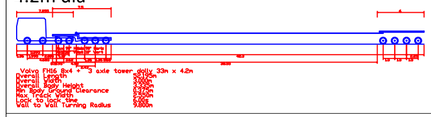


Notes:

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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Tower body outline

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Points 003 and 004 33m long, 4.2m dia. tower section transported by Tower Transporter

Scale	SLR Project No.
1:1000 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
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Date: May 2026	Date: May 2026	Date: May 2026	Date: May 2026

Drawing Number: **428.V12085.00001_1022**

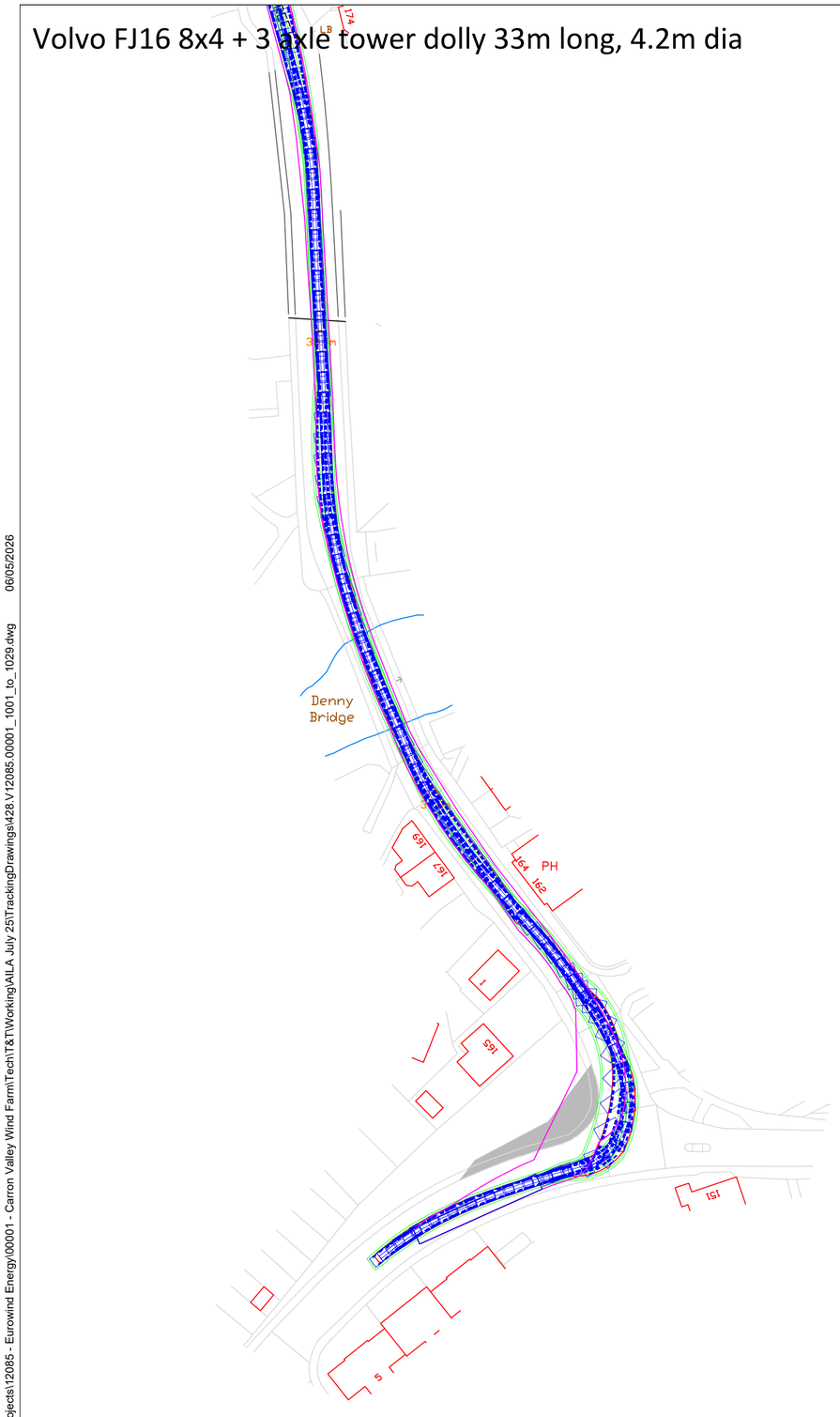
Rev.

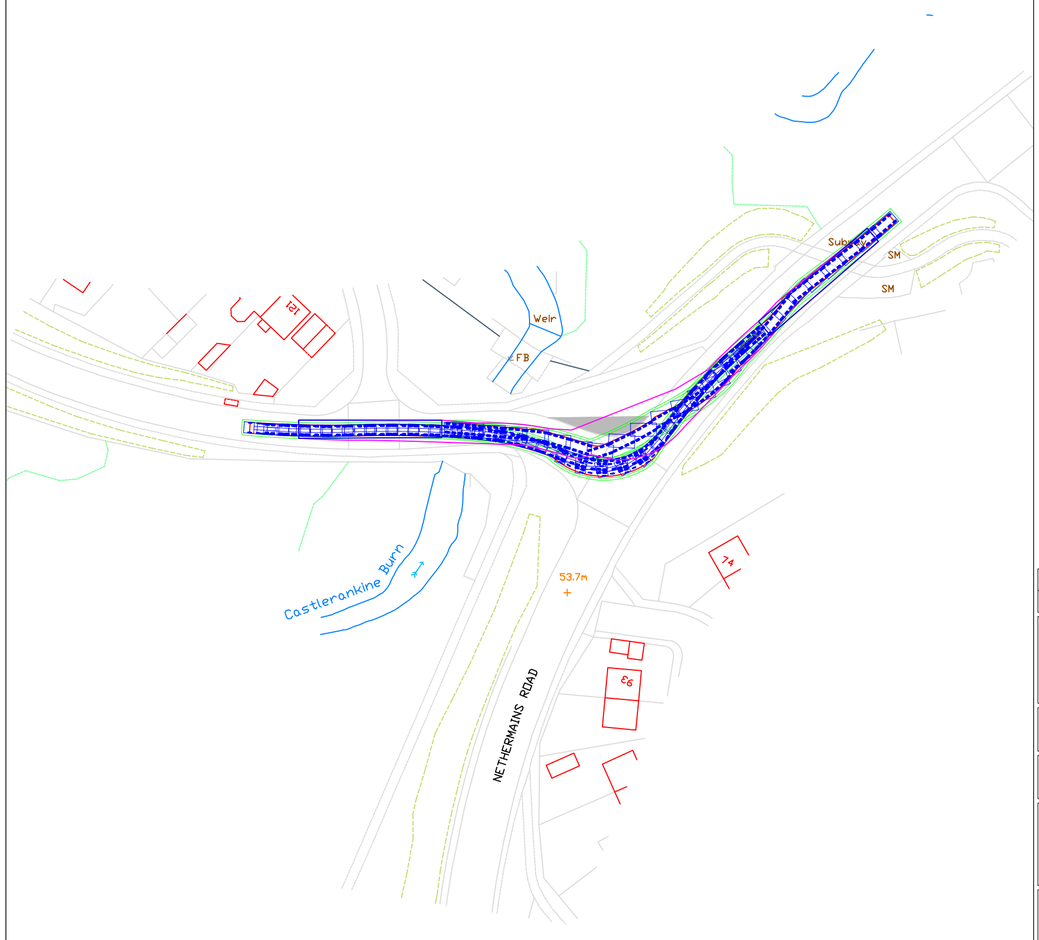
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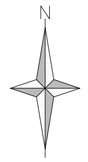
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia





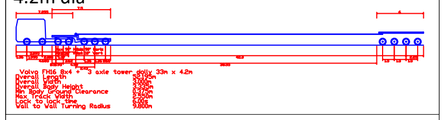


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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Points 005 and 006 33m long, 4.2m dia. tower section transported by Tower Transporter

Scale	SLR Project No.
1:1000 @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
GK	GK	IL	IL
May 2026	May 2026	May 2026	May 2026

Drawing Number: **428.V12085.00001_1023**

Rev.

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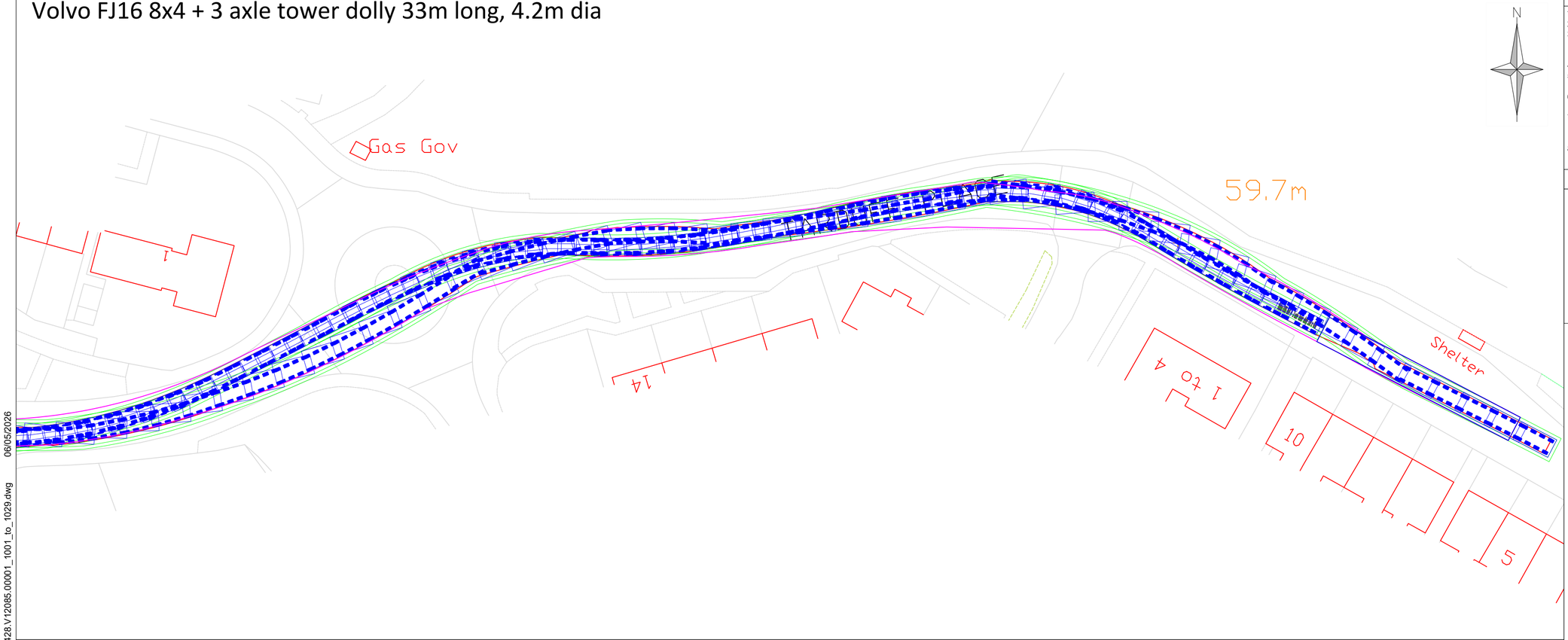
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



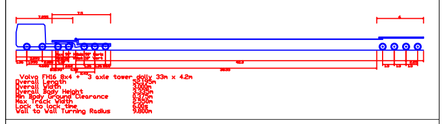


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Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Points 007 and 008 33m long, 4.2m dia. tower section transported by Tower Transporter

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Designed	Drawn	Checked	Authorised
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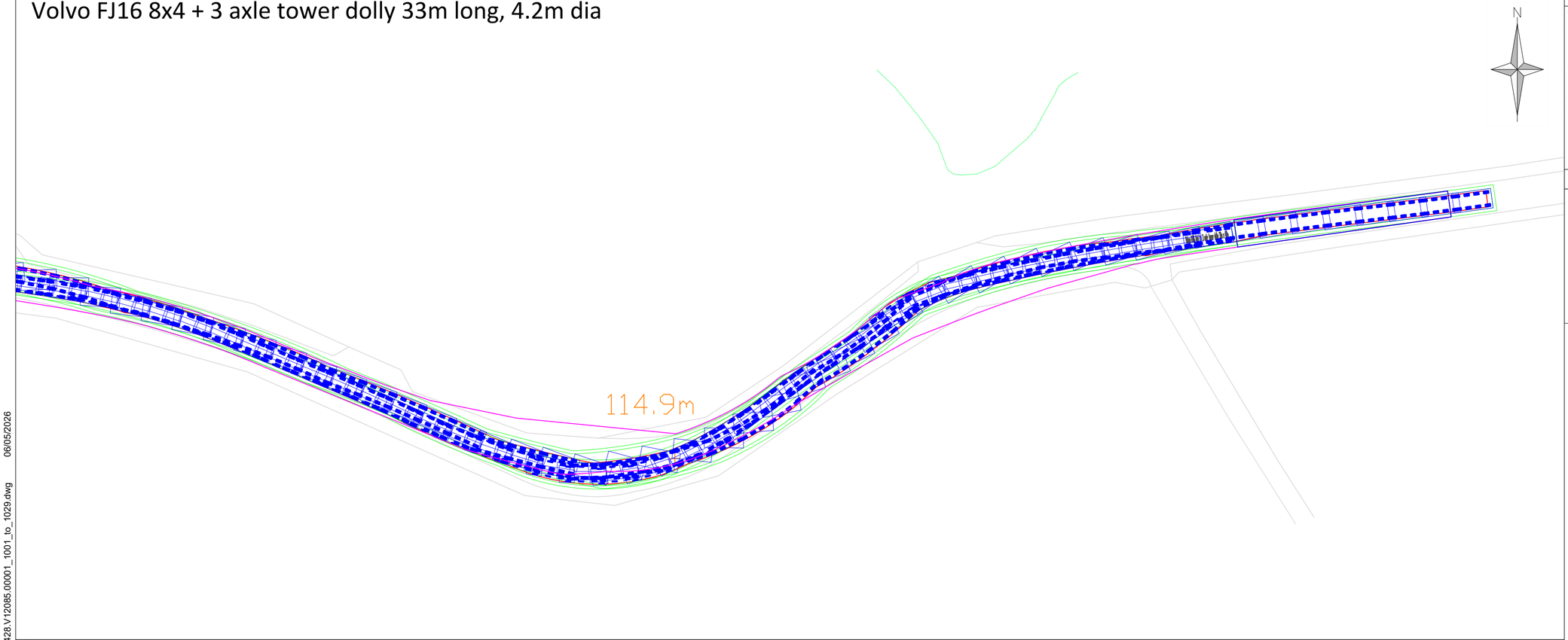
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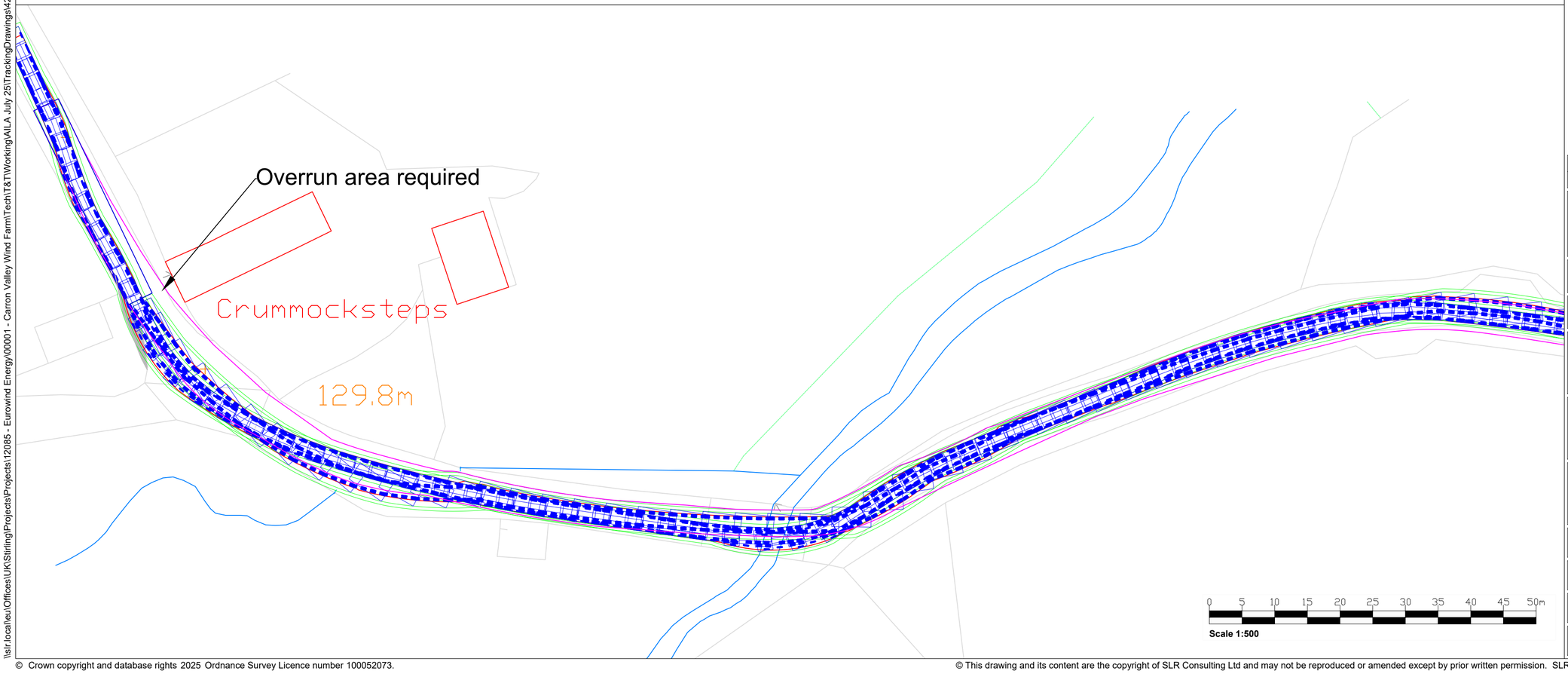
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



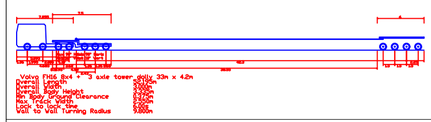


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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia


Volvo FH16 8x4 + 3 axle tower dolly 33m x 4.2m
Overall Length 33000m
Overall Width 4200m
Overall Height 4200m
Max Body Height 4200m
Min Body Ground Clearance 1000m
Max Vehicle Width 4200m
Kingpin to Rear Axle Line 7900m
Kingpin to Rear Bogie Centre 8000m
Kingpin to Rear Bogie Centre 1400m
Kingpin to Rear Bogie Centre 1400m
Kingpin to Rear Bogie Centre 1400

Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia

131.4m

Track

0 5 10 15 20 25 30 35 40 45 50m

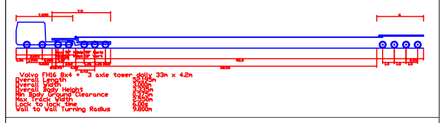
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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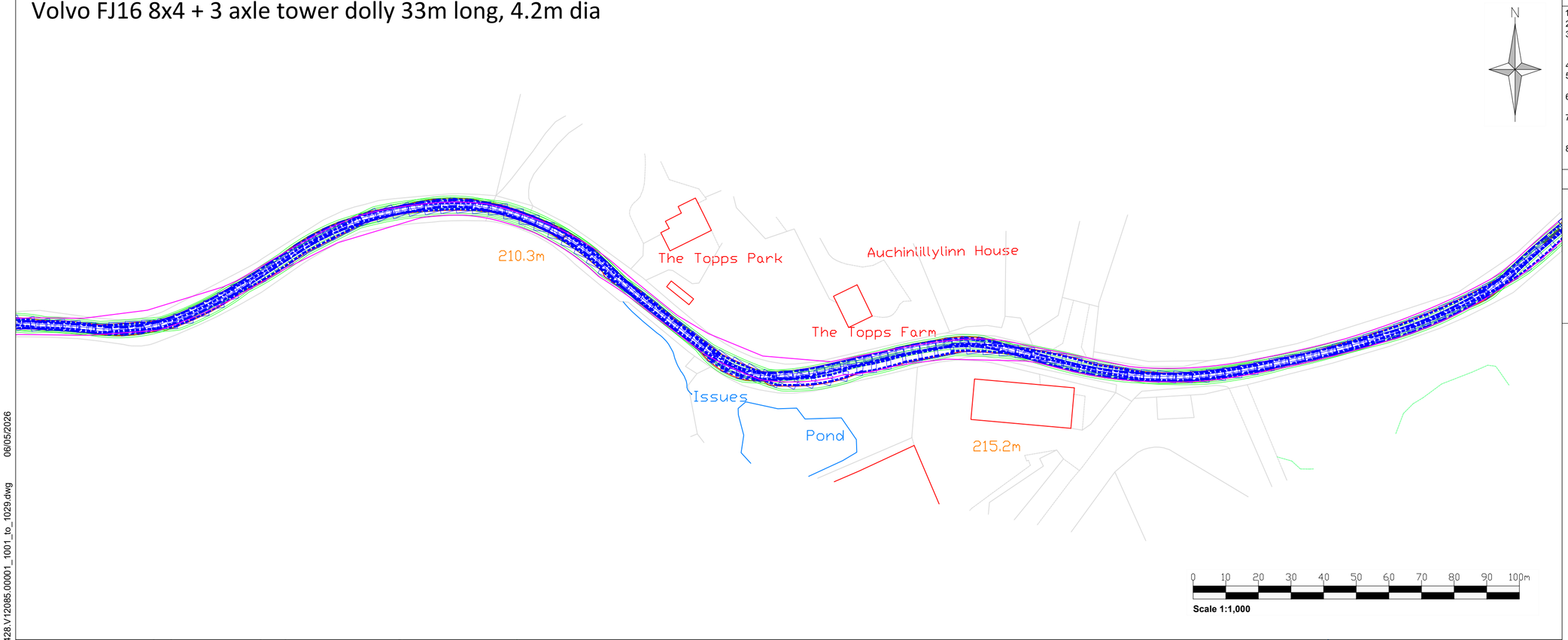
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Client: Eurowind Energy	
Project: Cairnoch Hill Wind Farm	
Drawing Title: Swept Path Analysis - Pinch Points 012 and 013 33m long, 4.2m dia. tower section transported by Tower Transporter	
Scale: 1:500 @ A2	SLR Project No.: 428.V12085.00001
Designed: GK / Date: May 2026	Drawn: GK / Date: May 2026
Checked: IL / Date: May 2026	Authorised: IL / Date: May 2026
Drawing Number: **428.V12085.00001_1026**	Rev.

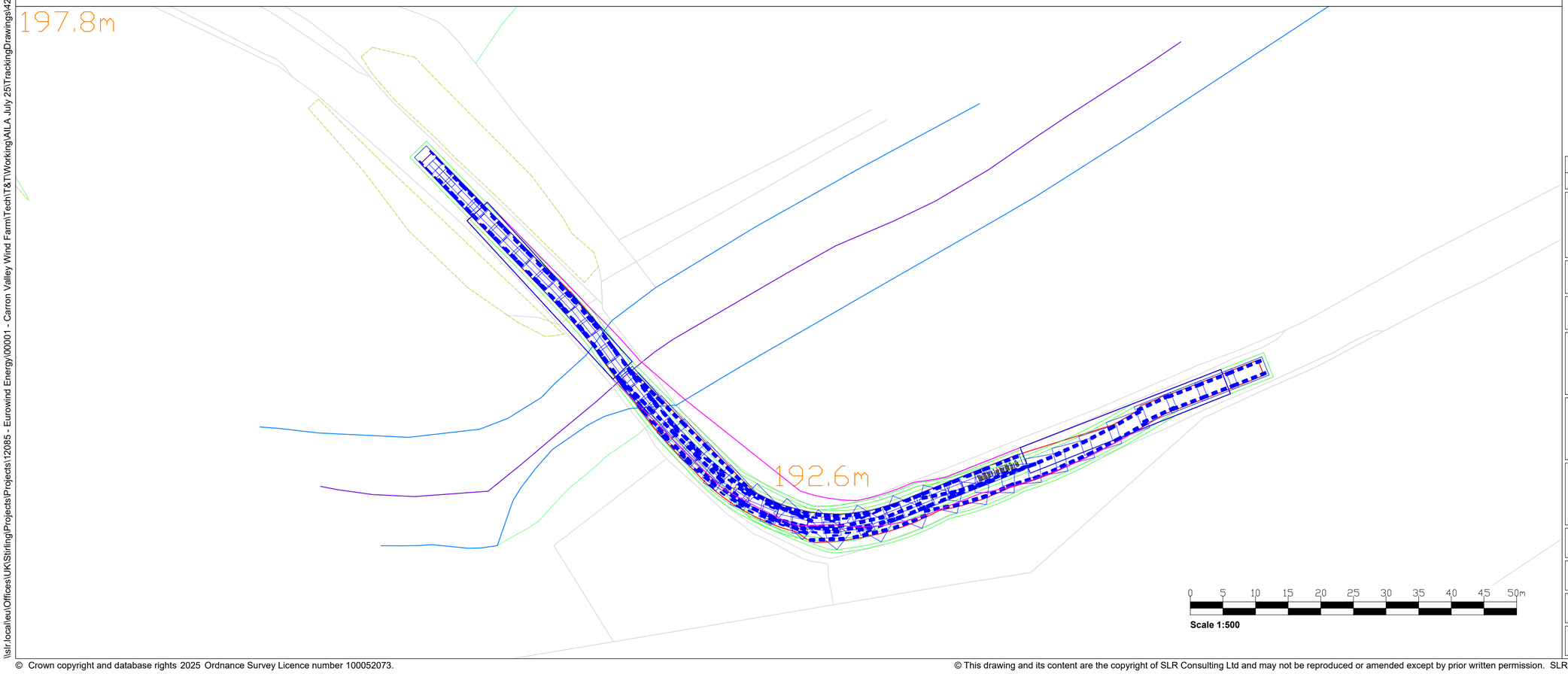
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



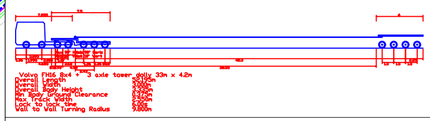


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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Points 014 and 015 33m long, 4.2m dia. tower section transported by Tower Transporter

Scale	SLR Project No.
As shown @ A2	428.V12085.00001

Designed	Drawn	Checked	Authorised
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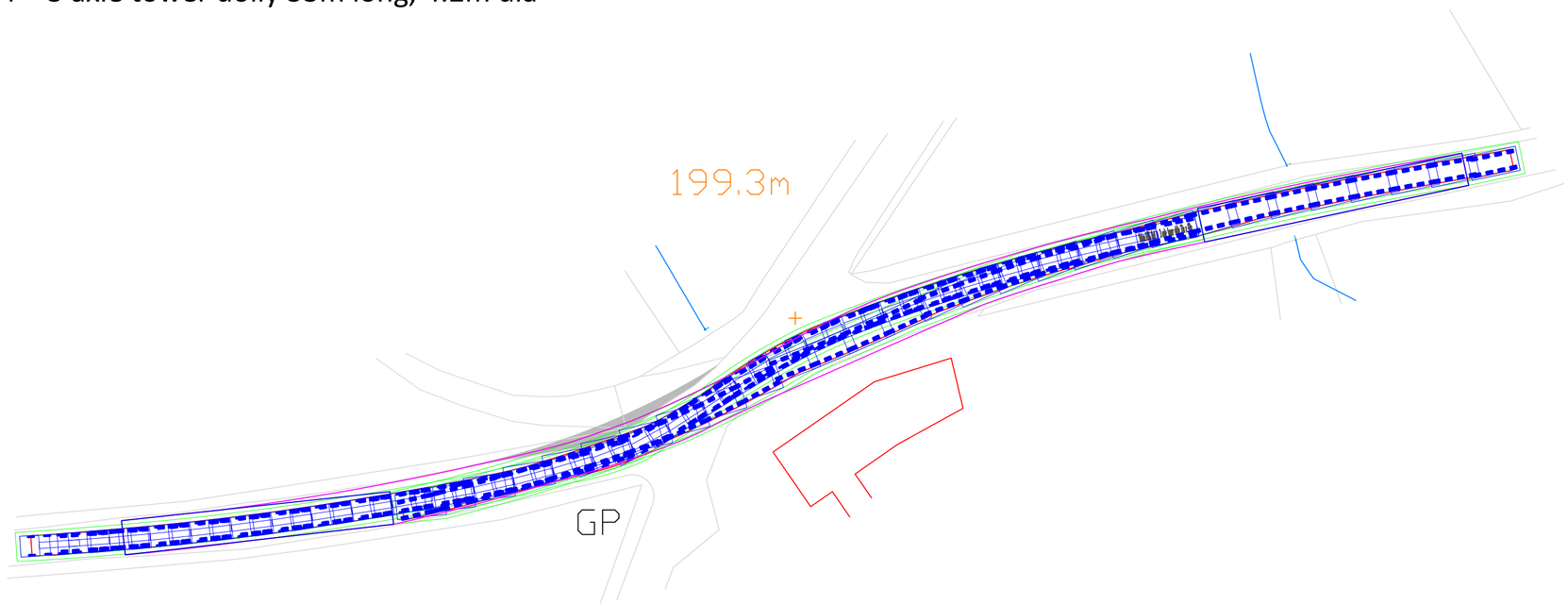
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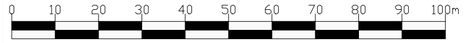
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia



Scale 1:500



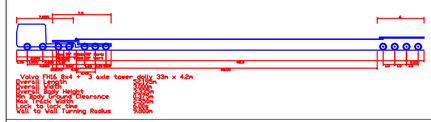
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8. SPA has been undertaken utilising manual rear wheel steering.

Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



Vehicle outline and wheel path

Vehicle envelope and 0.5m offset envelope

Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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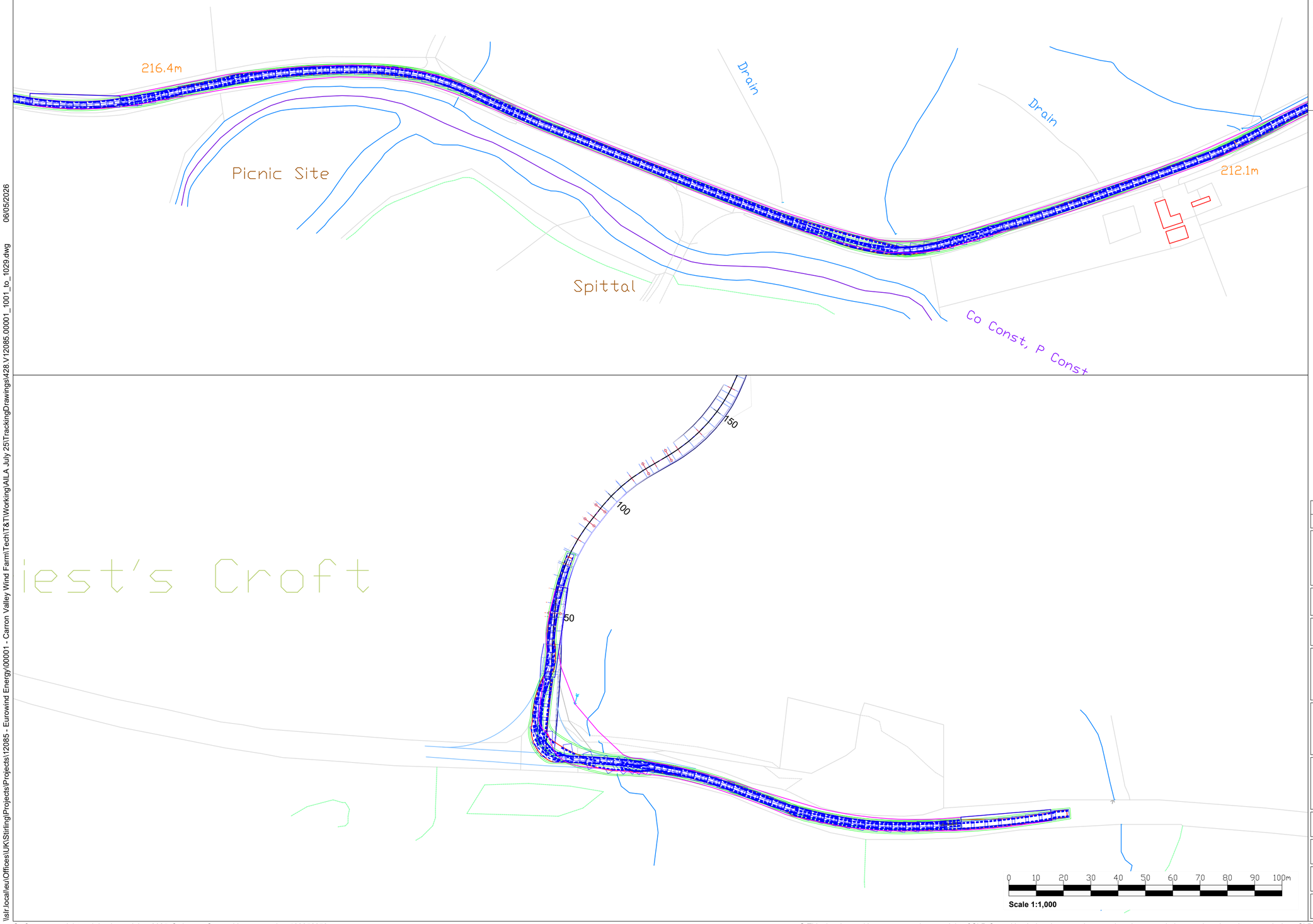
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Volvo FJ16 8x4 + 3 axle tower dolly 33m long, 4.2m dia

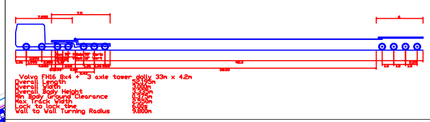


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Legend:

Volvo FJ16 8x4 + 3 axle tower dolly. 33m long, 4.2m dia



- Vehicle outline and wheel path
- Vehicle envelope and 0.5m offset envelope
- Tower body outline

Rev	Amendments	Date	By	Chk	Auth

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Drawing Purpose: **For information**

Suitability Code:

Client: Eurowind Energy

Project: Cairnoch Hill Wind Farm

Drawing Title: Swept Path Analysis - Pinch Points 018 and 019 33m long, 4.2m dia. tower section transported by Tower Transporter

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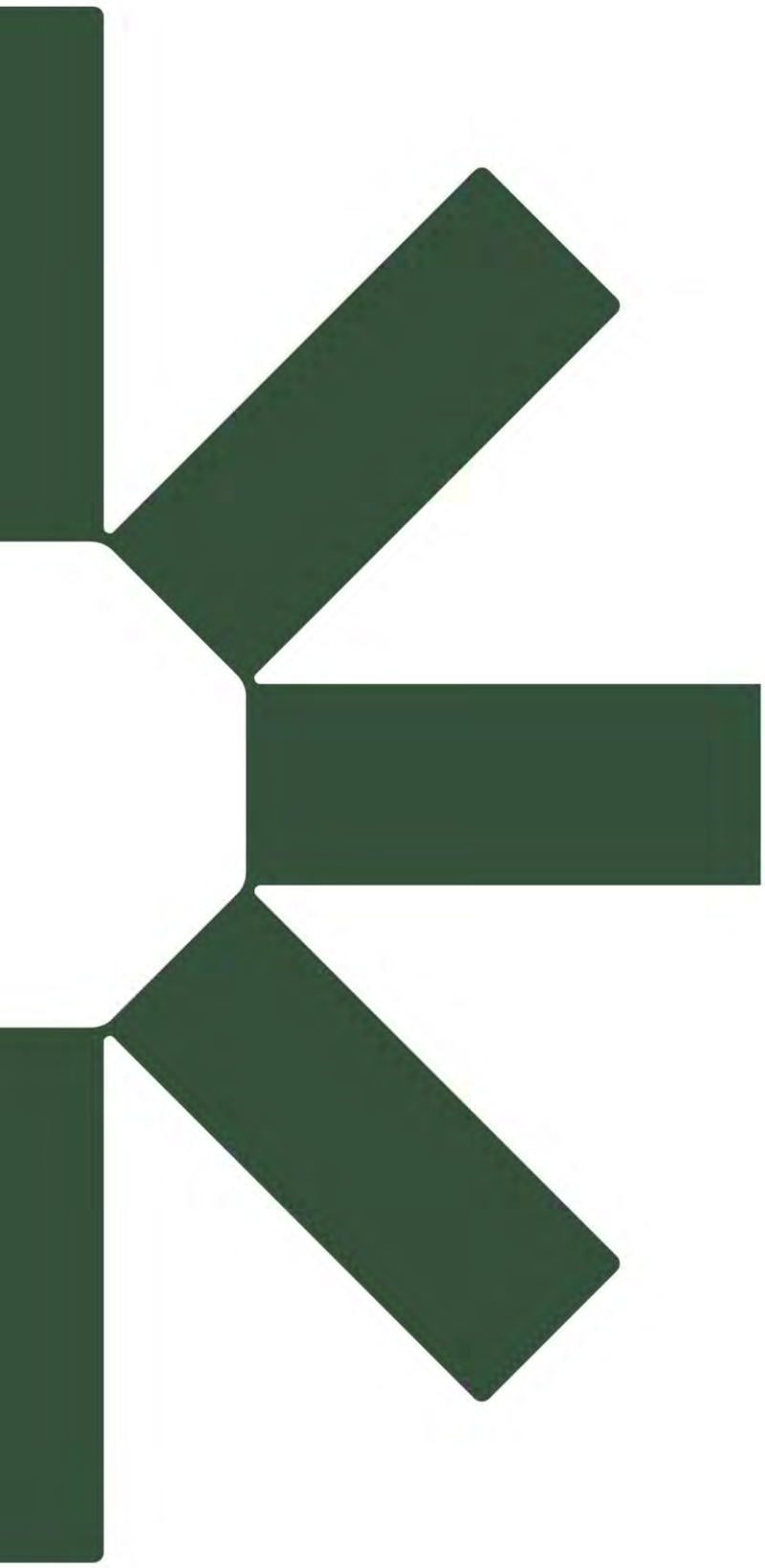
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Making Sustainability Happen

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Technical Appendix 13.1

Construction Noise Report

Cairnoch Hill Wind Farm

Eurowind Energy Limited

16646-004-R2
27 July 2026

PUBLISHED

Eurowind Energy™

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Quality Assurance

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Revision	Status	Prepared by	Checked by	Approved by	Date
R0	FIRST ISSUE	RE	AD	AB	01/06/2026
R1	CLIENT COMMENTS	AD	AB	AB	19/06/2026
R2	LEGAL COMMENTS	AD	AB	AB	27/07/2026

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Executive Summary

TNEI Services Limited (TNEI) was commissioned by Eurowind Energy Limited ('the Applicant') to undertake predictions of noise levels associated with the construction of the proposed Cairnoch Hill Wind Farm (the Proposed Development). The noise predictions were used to assess the potential impact of noise attributable to the construction of the Proposed Development on the occupiers of nearby noise sensitive receptors.

The noise impact assessment was undertaken using guidance contained in BS 5228: Part 1 2009+A1:2014 *'Noise and vibration control on construction and open sites- Noise'* and the calculation methodology in ISO9613: 2024 *'Acoustics - Attenuation of sound during propagation outdoors' -Part 2: General Method of Calculation*', together with noise data for appropriate construction plant.

Seven residential receptors neighbouring the Proposed Development were identified as the nearest properties located to the proposed construction activities on the Site. Predictions have been made assuming that all items of plant are operating continually throughout the assessment period to provide a worst-case scenario. In addition, the noise model assumes that noise sources would be located within the most likely activity areas closest to the receptors, whereas in reality plant would move around the Site and only a proportion of the plant may be operating at any one time. As such, the predictions are inherently likely to over-predict the actual sound levels that are likely to be experienced.

The results show that the predicted noise levels would be below the most stringent of the noise threshold levels detailed in BS 5228 and therefore no significant impacts are predicted. Nevertheless, mitigation in the form of good practice during construction is recommended to keep noise to a minimum and recommendations in accordance with BS 5228 have been made in this report.

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APPENDICES

Annex 1 – Figures

Annex 2 – Noise Model Data

1 Introduction

1.1 Brief

TNEI was commissioned by the Applicant to undertake a construction noise assessment for the Proposed Development. The following steps summarise the noise assessment process:

- Establish typical ambient noise levels at sensitive receptors located closest to the anticipated construction activities and derive appropriate noise threshold levels;
- Undertake predictions of activity noise throughout the construction period that would be incident at the nearest sensitive receptors;
- Compare the predicted noise levels across the construction period with the derived threshold values; and,
- Identify any requirements for mitigation measures, if needed.

The following terms and definitions are used throughout this report;

- **Emission** refers to the sound level emitted from a sound source, expressed as either a sound power level or a sound pressure level;
- **Immission** refers to the sound pressure level received at a specific location from a noise source(s);
- **SWL** indicates the sound power level in decibels (dB);
- **SPL** indicates the sound pressure level in decibels (dB);
- **NSR** (Noise Sensitive Receptor) are identified receptors that are sensitive to noise;
- **NML** (Noise Monitoring Location) refers to any location where baseline or specific noise levels have been measured; and
- **CNAL** (Construction Noise Assessment Location) refers to any location where the noise immission levels are calculated and assessed.

Unless otherwise stated, all noise levels refer to free field levels i.e. noise levels without influence from any nearby reflective surfaces.

All coordinates refer to Ordnance Survey British National Grid using Eastings, Northings.

1.2 Site Description

The Proposed Development is located on land ('the Site') at Cairnoch Hill, immediately (within 30 m) north of the Carron Valley Reservoir, and approximately 5 km from the settlement of Fintry, Stirlingshire. The Site is located entirely within the administrative boundary of Stirling Council and is centred on National Grid Reference NS 69557 85797. The proposed layout and details of the Site infrastructure are shown on Figure 13.1.1 in Annex 1.

The Proposed Development would be accessed via the B818 through a proposed southern access track. Noise impacts from the construction and use of these access tracks, including the upgrading of the existing junction, will be considered, with all activity being modelled within the Site.

1.3 Project Description

A detailed description of the Proposed Development and the construction requirements can be found in **Chapter 3: Description of the Development.**

Construction of the Proposed Development will require the establishment of two temporary construction compounds and a laydown area, the laying of tracks from the Site entrance up to the construction compound and across the Site to the wind turbine locations, the working of a single borrow pit, excavation of turbine foundations, construction of turbine bases, installation of turbines, and the installation of a substation and other infrastructure.

The construction period is anticipated to last for 16 months. Table 1-1 (overleaf), which presents an indicative construction timetable, is taken from **Chapter 3: Description of the Development**. Yellow coloured cells indicate construction activities that have been included in the construction noise assessment, whereas cells shaded grey indicate construction activities that would not typically generate high levels of noise, and as such are excluded from the assessment. Examples of such activities could include wiring of plant, activities using handheld tools, and turbine commissioning tests.

Construction activities are expected to be limited to the following hours;

- Monday – Friday 07:00– 19:00
- Saturday 07:00-16:00

Standard construction activities are not anticipated outside of the above times; however, it should be noted that some activity outside of the core hours could arise, under certain conditions. Examples include construction activities that cannot be stopped once they have begun, such as turbine erection or concrete pours; or where deliveries need to occur outside of standard working hours, for example, to receive Abnormal Indivisible Loads (AILs).

No night-time construction activities are expected, however, there may be requirement to run a small amount of fixed plant during the night-time, for example to provide power to site cabins or provide lighting for health and safety reasons. The assessment, therefore, considers the potential for night-time noise impacts.

Table 1-1: Indicative Construction Timetable

Construction Activity	Month															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Access Road Improvements																
Site Establishment																
Tree Clearance																
Construction of Tracks, Crane Pads and Compounds																
Turbine Foundation Construction																
Substation - Civil & Electrical Works																
Turbine Delivery and Erection																
Cable Laying & Cable Bedding																
Site Restoration																

2 Legislation, Policy and Guidance

2.1 Legislation

The overarching European legislation in relation to terrestrial environmental noise is the 'Environmental Noise Directive' (END) (1). The END aims to limit people's exposure to environmental noise but does not prescribe noise limits. Instead, it requires each member state to provide data on noise exposure, and to develop action plans to prevent or reduce noise exposure and to preserve existing quiet areas. Although the UK has now left the EU, this requirement is still in place as the END is transposed and implemented within The Environmental Noise (Scotland) Regulations.

The Control of Pollution Act 1974 (COPA 74), as amended (2), is used to control the noise impacts of construction works. Specifically, Section 60 allows Councils to impose restrictions on construction works, including specifying the plant allowed to be used, hours of activity, or the setting of noise levels that may be emitted from a site. Section 61 allows contractors to apply for permission from the Council to undertake 'noisy' construction activities, for example, railway maintenance during night-time hours, or demolishing a building close to residential receptors.

The *Environmental Protection Act 1990* (3) supersedes much of the COPA 74 (though COPA 74 is still relevant for construction noise), and Section 79(1)(g) allows action to be taken where a noise is likely to be harmful to health or a nuisance. This legislation is, however, for 'after the event' i.e. for use if a harmful noise is present, and not for planning purposes, where a harmful noise is yet to be established.

2.2 National Planning Policy

National Planning Policy 4 (NPF4) (4) refers to environmental noise in respect of general health and safety and also in the context of energy developments. Policy 23 (Health and Safety) requires that proposed developments consider and mitigate noise pollution, whist Policy 11 (Energy) supports the expansion of renewable energy, but emphasises that such developments must be sited and designed to minimise adverse impacts, including noise. There is no mention, however, regarding noise from construction works specifically.

No further detail is provided in NPF4, however, at a national level, *Planning Advice Note (PAN) 1/2011 Planning and Noise* (5) is the overarching document in relation to how environmental noise should be considered for new developments. The PAN "*provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise*."

The PAN does not present any noise level limits or specific assessment methods, however, guidance on the assessment of environmental noise is included in the accompanying *Technical Advice Note (TAN) Assessment of Noise.* (6)

Both the PAN the accompanying TAN provide little guidance in respect of construction noise, other than recommending that the use of planning conditions is not the preferred method for controlling temporary construction noise. Specifically, PAN 1/2011 states:

"32. While planning conditions can be used to limit noise from temporary construction sites, it is most effectively controlled through the Control of Pollution Act 1974 (COPA74) and the Pollution and Prevention Control Act 1999 for relevant installations. Notice can be served in advance of works and site conditions set to control activities."

2.3 Relevant Guidance

BS 5228:1997 Noise and vibration control on construction and open sites. Code of practice for basic information and procedures for noise and vibration control, Parts 1 to 5 (7) is the approved Code of

Practice under COPA74, however, it is the 2009 version of the Standard that should be used for planning applications. In this regards the TAN states:

"However, under Environmental Impact Assessments and for planning purposes i.e. not in regard to the Control of Pollution Act 1974, the 2009 version of BS 5228 is applicable. The 2009 version of the standard consists of Parts 1 and 2 for noise and vibration respectively."

Accordingly, the assessment of construction noise in this report is undertaken with reference to the most up to date version of the standard, which is *BS 5228:2009+A1:2014 Parts 1 and 2*[1]. (8) (9)

Part 1 of BS 5228 provides useful guidance on practical noise control and management, with recommendations for basic methods of noise control, including sections on community relations, training, occupational noise effects, neighbourhood nuisance and project supervision. The annexes provide information on typical construction noise sources, noise calculation procedures, mitigation measures and their effectiveness.

Annexes C and D present measured noise levels from construction activities measured across multiple construction sites in the UK, that may be used to inform the prediction of noise from proposed construction activities. Annex E presents methods of assessing the significance of impacts from construction noise.

[1] The current version of BS 5228 comprises two parts. Part 1 Noise, and Part 2 Vibration. This assessment considers Part 1 only.

3 Methodology

3.1 Considering the Potential for Noise Impacts

Noise levels from construction activities will vary continually over time, as activities and plant start and stop, and move around the Site. To assess the potential impacts of construction noise, a series of worst-case scenarios can be considered, where construction plant and activities are assumed to be working continually and in locations closest to the nearest sensitive receptors.

It would not be appropriate, however, to assume a worst case scenario where a particular item of mobile plant is located directly opposite a receptor for any prolonged period of time (under most circumstances). An example of this could be where an excavator is working along a line to dig a cable trench over a number of weeks, which passes close to a receptor for only a few hours or days. Therefore, in the case of mobile plant, this is modelled as a point source that moves along a defined path, averaging out the sound power level across the length of the line, rather than concentrating it in a single location next to the receptor. In such cases, the predicted noise level will represent an average level expected to be received for the majority of the activity period, however, it should be recognised that when directly opposite a receptor, noise levels would be higher than predicted for a short period of time.

Notwithstanding these discrete occasions, the overall noise level attributable to construction activities from the Proposed Development site will tend to be higher in the assessment than what will actually occur for the majority of the time, given that all plant is assumed to be operating continually and concurrently.

3.2 Study Area

Noise Sensitive Receptors (NSRs) are properties, people or fauna that are sensitive to noise and, therefore, may require protection from nearby noise sources. The Study Area for the construction noise assessment is defined through the identification of the closest NSRs to the Proposed Development, on the assumption that if noise levels are acceptable at the closest receptors, then they should also be acceptable at more distant locations.

A representative sample of Construction Noise Assessment Locations (CNALs) have been chosen to represent the closest receptor or group of receptors. Table 3-1 details the CNALs considered within the assessment, which are also shown in Figure 1.1 (Annex 1).

Table 3-1: Construction Noise Assessment Locations (CNALs)

CNAL Name	Coordinates (BNG)	
	Easting	Northing
CNAL1 - Glendales Farmhouse	272463	684356
CNAL2 - Reservoir Keepers House	271612	684005
CNAL3 - Cairnoch Farm	269302	684500
CNAL4 - Cairnoch Bothy	269275	684519
CNAL5 - Todholes	267304	686079

CNAL Name	Coordinates (BNG)	
	Easting	Northing
CNAL6 - Cairnoch Lodge	270317	686773
CNAL7 - Easter Cringate	270468	686868

3.3 Methodology for the Prediction of Noise

To predict the noise immission levels attributable to the construction of the Proposed Development, a noise propagation model has been produced using the propriety noise modelling software CadnaA. Within the software, complex models can be used to simulate the propagation of noise according to a range of international calculation standards, including BS 5228 and *ISO 9613 2:2024 Acoustics - Attenuation of sound during propagation outdoors: Engineering method for the prediction of sound pressure levels outdoors* (10).

For this assessment, noise modelling was undertaken using the ISO 9613-2 propagation model, which was chosen in preference to the calculation method presented in BS 5228, primarily because of some of the significant distances from source to receptor evident on this site. Specifically, BS 5228 notes in F 2.2.2.2, that at distances over 300 m noise predictions using the BS 5228 methodology should be treated with caution, especially where a soft ground correction factor has been applied, because of the increasing importance of meteorological effects; whereas ISO 9613-2 provides equations that have been validated up to greater distances.

The model uses the octave band sound power output of the proposed construction plant as its acoustic input data, and calculates on an octave band basis, attenuation due to geometric spreading, atmospheric absorption, topography and barriers and ground effects.

For the purposes of this assessment, all noise level predictions have been undertaken using a receiver height of 1.5 m above local ground level. Soft ground (G=1) attenuation has been assumed at all locations except for water bodies, construction compounds, turbine bases and similar areas of hardstanding, which have been modelled with a ground attenuation of G=0 (hard ground).

Air absorption based on a temperature of 10°C and 70 % relative humidity has been assumed.

3.4 Limitations of the Noise Model

The noise propagation models are intended to give a good approximation of the construction noise level and the contribution of each individual noise source. However, it is expected that actual levels are unlikely to be matched exactly with modelled values and the following limitations in the model should be considered:

- In accordance with ISO 9613-2, all assessment locations are modelled as downwind of all noise sources and propagation calculations are based on a moderate ground-based temperature inversion, such as commonly occurs at night;
- The predicted barrier attenuation provided by local topography, embankments, walls, buildings and other structures in the intervening ground between source and receiver can only be approximated and not all barrier attenuation will have been accounted for;
- Unless specifically stated, the modelled scenarios assume all noise sources are operating continuously and simultaneously, estimating a worst-case noise level; and

- All mobile plant assumed to be working on tracks (excavators, dozers, rollers etc) have been modelled as moving point sources along their anticipated movement paths and the sound power level of the source is effectively averaged out across the length of the entire line. This will give an approximation of the overall noise levels from mobile plant at receptor locations; however, in reality noise levels would fluctuate as construction plant and activities move around in their activity areas.

3.5 Methodology for the Assessment of Noise

The construction noise assessment is undertaken as follows:

- Define Noise Assessment Locations (NALs) to represent the closest NSRs;
- Identify applicable Threshold Levels to identify potentially significant effects;
- Predict noise levels for various construction activities or phases at each NAL;
- Compare the predicted levels and duration of exposure to the BS 5228 Threshold Levels; and,
- Where necessary, develop suitable mitigation measures to minimise any significant adverse effects.

Annex E, part E.3.2 of BS 5228-1, provides example methods for assessing the significance of construction noise effects and gives examples of acceptable levels for construction noise.

Table E.1 of BS 5228-1 (represented here as Table 3-2) contains an example of the significance criteria that can be used to assess construction noise for residential receptors.

Three categories of thresholds are provided for varying assessment periods (night-time, evenings, weekends etc.). The appropriate category for any given receptor can be chosen after quantifying the existing ambient noise levels (rounded to the nearest 5 dB) at that location for the given assessment period. BS 5228 provides the following advice regarding the thresholds:

- *"Note 1: A potential significant effect is indicated if the LAeq,T noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.*
- *Note 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total LAeq,T noise level for the period increases by more than 3 dB due to site noise.*
- *Note 3: Applied to residential receptors only."*

Therefore, the assessment of construction noise reflects a specific noise threshold for the locality for a particular period of the day, rather than an absolute noise level limit.

Table 3-2: Example of Threshold of Potential Significant Effect at Dwellings

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq,T}$ dB		
	Category A[(A)]	Category B[(B)]	Category C[(C)]
Night-Time (23:00 – 07:00)	45	50	55
Evenings and Weekends[(D)]	55	60	65

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq,T}$ dB		
	Category A(A)	Category B(B)	Category C(C)
Daytime (07:00 – 19:00) & Saturdays (07:00 to 13:00)	65	70	75

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

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

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

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

It should be noted that exceedance of the threshold does not in itself indicate a significant effect, rather, the standard states; *"If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect".*

3.6 Determining the Threshold Levels

Given the rural setting of the Proposed Development, the likely existing ambient noise levels at NSRs around the proposed development are assumed to be low. Therefore, the BS 5228 Category A Threshold Values have been selected for all receptors and all time periods. These are the most stringent threshold values and typically reflect low ambient noise levels in the area.

Accordingly, given the core construction hours and Category A Threshold values, the assessment has been made against the following noise levels at all NALs:

- 65 dB $L_{Aeq(t)}$ for Daytime weekdays 07:00 – 19:00 and Saturday 07:00 – 13:00. These are within the core construction hours for this Proposed Development.
- 55 dB $L_{Aeq(t)}$ for Weekday evenings 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 -23:00. The core construction hours overlap with these time periods on Saturday between 13:00 – 16:00.
- 45 dB $L_{Aeq(t)}$ for Night-time 23:00 – 07:00. This is outside of the core construction hours for the Proposed Development but is considered nevertheless against predictions of a potential scenario of generators operating within the construction compound.

4 Noise Impact Assessment

4.1 Modelling of Individual Sound Sources

Noise immission levels would vary throughout the construction period as construction activities, plant and locations vary. For much of the working day the noise associated with construction activities would be less than predicted, as the assessment assumes all equipment is continually operating at full power and in locations closest to the NSRs, whereas in practice, equipment load, and precise location may vary throughout the day. This approach has been adopted to represent a worst-case assessment.

At this stage a detailed plant list is not available, therefore, a generic plant list based upon experience of similar projects has been used. All modelled noise sources and associated sound power level (SWL) and sound pressure level (SPL) data is included in Annex B: Noise Model Data.

For felling activities, broadband noise level data for a harvester, a forwarder and a skidder has been taken from Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment (11) (Forestry Commission). No octave band data is available therefore modelling has been undertaken using the 500 Hz octave band data, as recommended in ISO 9613. Noise levels for the Harvester and Forwarder are actually given in the documentation at the operator position inside a Q Cab, so to estimate external levels, 10 dB has been added to the quoted level and a sound power level for each item of plant calculated within CadnaA, assuming the quoted sound pressure levels (SPLs) have been measured at a distance of 1 m.

For all other construction activities, source noise level data was taken from Annex C of BS 5228, which provides octave band SPL levels for a wide variety of construction plant and activities suitable for the estimation of noise immission levels.

Construction noise sources for any given activity would generally comprise a mix of both moving and static sources. Mobile sources include mobile construction plant and Heavy Goods Vehicles (HGVs), while static construction plant could include piling rigs and pumps. Static equipment is usually located at a fixed location for an extended period of time.

For both mobile and static plant, activity noise levels would be transient in nature due to changes in location, on/off periods, and fluctuations of load on any individual machine.

All static items of plant and activities have been modelled as single point sources. All mobile plant (excavators, dozers, dumpers etc.) have been modelled as either a moving point source (line source) along their anticipated movement paths or as a stationary point source located at the closest point of its anticipated work area to any given CNAL.

4.2 Modelling of Construction Activities

Noise propagation modelling has been undertaken considering the key activities that are likely to occur throughout the construction period. This is based on the indicative information found in **Volume 2, Chapter 3: Description of the Development** and detailed in Table 1-1 of this report.

A number of scenarios have been modelled which consider the works planned during core construction hours for each month of the construction period.

Whilst construction activities are not planned outside of core construction hours, it may be necessary to complete works such as turbine erection or concrete pours, or to receive AIL deliveries which cannot take place during standard working hours. A specific evening and weekend scenario has not been modelled but the predicted noise levels for the months where these activities are planned can be compared to the threshold value to consider this.

Although no construction activities are anticipated during the night-time, there may be a requirement for generators to operate within the construction compound outside of daylight hours, as detailed in Section 1.3 above. As such, a night-time scenario which considers diesel generators for lighting rigs/ welfare facilities has also been modelled.

Details of the items of plant assumed to be operating in each modelled scenario, as well as noise data for each modelled noise source, are included in Annex B.

For the purposes of this assessment the following scenarios have been modelled:

- Month 1 - Initial works begin on site with the upgrading of the original access road onto the Site, improving Site accessibility, alongside the felling of trees to clear turbine site locations.
- Month 2 - Site Establishment commences and Access Road Improvements are temporarily completed. Initial Felling activities are completed.
- Month 3 - Site Establishment continues with more deliveries arriving to site.
- Month 4 - Site Establishment is completed and secondary felling activities are undertaken. The temporary construction compounds commence operation.
- Month 5 - Access tracks from existing roads towards Turbine 1 (T1) are constructed.
- Month 6 - Secondary Access Road Improvements begin at the Site entrance. Construction of Access tracks from existing roads towards Turbine 2 (T2) and Turbine 3 (T3), and construction of Crane Pad at T1. The borrow pit begins operation.
- Month 7 - Secondary Access Road Improvements at the Site entrance and construction of Access Tracks from existing roads towards Turbine 4 (T4). Construction of Crane Pad at T2 alongside the beginning of construction of the Substation.
- Month 8 - Turbine Foundation excavation at T1 alongside the construction of Crane Pad at T3.
- Month 9 - Turbine Foundation excavation at T1 and construction of Crane Pads at T4.
- Month 10 - Turbine Foundation construction at T1 and Turbine Foundation excavation at T2. Initial turbine deliveries begin.
- Month 11 - Turbine Foundation construction at T2 and Turbine Foundation excavation at T3.
- Month 12 - Turbine Foundation construction at T3 and Turbine Foundation excavation at T4. Turbine deliveries are completed.
- Month 13 - Turbine Foundation construction at T4. Turbine Erection at T1.
- Month 14 - Turbine Erection at T2.
- Month 15 - Turbine Erection at T3.
- Month 16 - Turbine Erection at T4, completion of the substation, and cessation of the borrow pit and temporary construction compounds.
- Night-time – Diesel generators for power and lighting within the temporary construction compounds.

These scenarios were modelled to try to represent some of the ‘noisiest’ anticipated scenarios. Other construction activities not included in the noise models would occur, however, the noise output from these would likely be less than those considered above.

4.3 Calculated Immission Levels

Table 4-1: Calculated Immission Levels (dB $L_{Aeq,t}$)

CNAL	Noise Immission Levels (dB $L_{Aeq,t}$)																
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	Night
CNAL1	23	34	32	32	32	33	35	34	34	34	34	35	35	31	31	34	16
CNAL2	27	35	34	32	34	35	35	35	35	35	35	35	36	33	33	35	17
CNAL3	36	45	45	43	50	47	47	47	47	49	49	47	47	46	46	47	26
CNAL4	35	44	44	42	50	47	47	47	47	48	48	47	47	46	46	47	26
CNAL5	28	30	29	27	41	41	41	41	41	41	41	41	41	41	41	41	12
CNAL6	32	32	31	33	41	42	42	42	41	42	42	41	41	41	40	41	14
CNAL7	30	32	32	33	40	41	41	41	41	41	41	40	40	40	40	40	15

For all CNALs the predicted noise levels for all scenarios are below the BS 5228 Daytime Category A threshold value of 65 dBA

Predicted noise levels during core construction hours are below the BS 5228 Evening and Weekend Category A threshold value of 55 dBA at all CNALs.

No construction activities are anticipated during the night-time, however, some generation plant or similar may operate during night-time hours within the construction compounds. The predicted noise levels for the modelled night-time scenario are below the night-time Category A threshold value of 45 dBA.

Accordingly, construction noise impacts are below the indicator for a likely significant effect. However, mitigation in the form of good practice during construction is recommended to keep noise to a minimum and recommendations in accordance with BS 5228 are discussed below.

4.4 Cumulative Noise

It is noted that the construction period could overlap with that of the consented Earlsburn Extension, or the proposed Drummarnock Wind Farms, which are located to the north and northeast of the Proposed Development, respectively.

Sound pressure levels add together logarithmically, and where two noise sources have noise levels that are more than 10 dB apart, no noise level increase will occur as a result of both sources operating together. For example; 40 dB + 30 dB = 40 dB.

Therefore, when considering the potential for cumulative noise effects, it is important to consider whether the noise levels from multiple developments are likely to be within or greater than 10 dB of each other at any given receptor.

In the unlikely event that the worst case construction noise levels from the Proposed Development be within 10 dB of the construction noise levels from Earlsburn Extension, or Drummarnock Wind Farms, the margin between the predicted construction noise levels due to the Proposed Development and the BS 5228 Daytime threshold value is such that the Proposed Development would not contribute significantly to any exceedance of the value that would indicate a significant effect.

5 Noise Mitigation Measures

No significant effects resulting from construction noise are predicted. Nevertheless, a range of good practice measures would be employed to reduce noise impacts.

Section 8 of BS 5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that can be employed onsite:

- Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern.
- Ensure that any extraordinary site work continuing throughout 24 hours of a day (for example, crane operations lifting components onto the tower) would be programmed, when appropriate, so that haulage vehicles would not arrive at or leave the Site outside of core hours or other specific delivery hours, with the exception of abnormal loads that would be scheduled to avoid significant traffic flows.
- Ensure all vehicles and mechanical plant would be fitted with effective exhaust silencers and be subject to programmed maintenance.
- Select inherently quiet plant where appropriate - all major compressors would be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which would be kept closed whenever the machines are in use.
- Ensure all ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Instruct that machines would be shut down between work periods or throttled down to a minimum.
- Regularly maintain all equipment used on site, including maintenance related to noise emissions.
- Vehicles would be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation.
- Ensure all ancillary plant such as generators and pumps would be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures should be provided.

The core hours for the proposed construction works are 07:00 to 19:00 Monday to Friday and 07:00 to 16:00 on Saturdays. The noisiest activities would therefore occur during these times with no regular work proposed in the evening, night-time or on Sundays or Bank Holidays.

6 Summary

The noise impact assessment has considered the existing noise environment at the CNALs to determine appropriate noise threshold levels for construction activities. The CNALs were chosen to represent the closest NSRs to the construction activities.

Noise propagation modelling has been undertaken in accordance with ISO 9613-2 and the anticipated noise immission levels presented for scenarios likely to occur throughout the construction period of the Proposed Development. The modelled scenarios consider the 'noisiest' activities that are likely to occur during the construction period and the modelling assumes that the construction activities are occurring at locations within the Site that are closest to the chosen CNALs.

During construction of the Proposed Development, the predicted noise levels during core construction hours at all receptors are below the most stringent Category A threshold values for both the Daytime and Weekend and Evening periods, as defined within BS 5228.

No construction is typically anticipated during night-time periods, however a scenario to consider generators running at the construction compounds was considered and predictions do not exceed the BS 5228 threshold value.

Predicted construction noise levels are below the indicator for likely significant effects. Nevertheless, mitigation in the form of good practice during construction is recommended to keep noise to a minimum and recommendations in accordance with BS 5228 have been made in this report.

Although there is the potential for construction to occur at the same time as the nearby Earlsburn Extension or Drummarnock Wind Farms, the margin between the predicted construction noise levels due to the Proposed Development and the BS 5228 threshold value is such that the Proposed Development would not contribute significantly to any exceedance of the value that would indicate a significant effect.

Therefore, no significant effects in relation to construction noise impacts are predicted.

7 References

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7. **British Standards Institute.** *Noise and Vibration Control on Construction and Open Sites. Code of Practice for Basic Information and Procedures for Noise and Vibration Control.* s.l. : BSI, 1997. BS 5228:1997-Parts 1-5.

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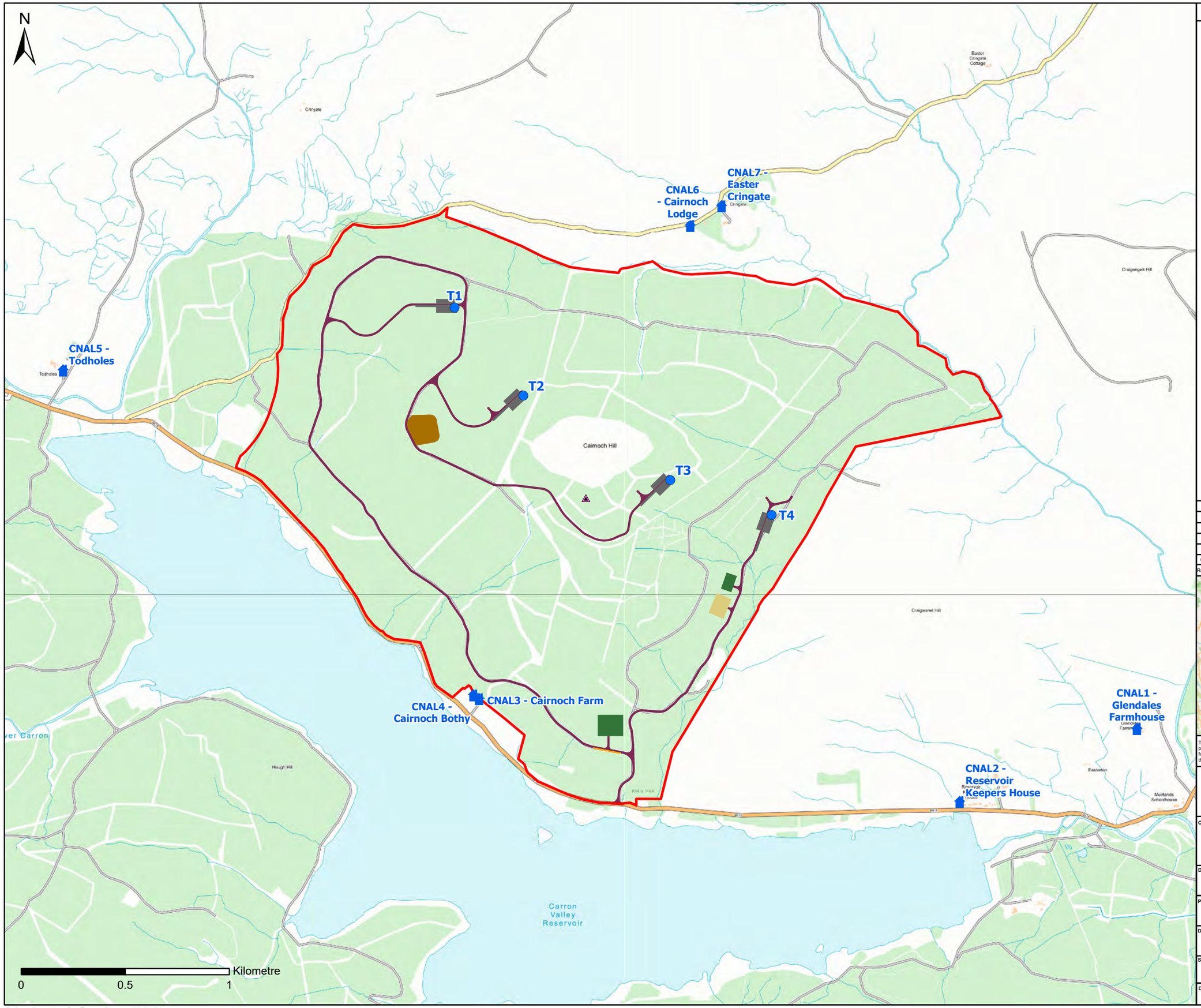
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10. **(ISO), International Organisation for Standardisation.** *Acoustics – Attenuation of Sound During Propagation Outdoors: Part 2: Engineering method for the prediction of sound pressure levels outdoors.* Geneva : ISO, 2024. ISO 9613-2:2024.

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Annex 1 – Figures

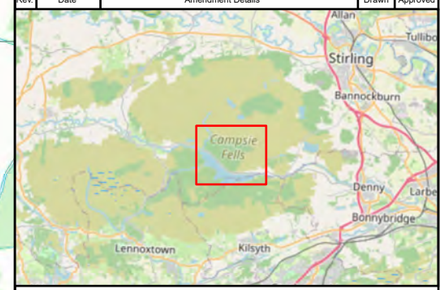
- Figure 1.1 – Study Area



LEGEND

- Site Boundary
- Construction Noise Assessment Locations (CNALs)
- Proposed Turbine Location
- Proposed Permanent Met Mast Location
- Proposed Construction Compound
- Proposed Substation Compound
- Proposed Crane Pad / Hardstanding
- Proposed Blade Laydown Area
- Proposed Track
- Proposed Borrow Pit

Rev.	Date	Amendment Details	Drawn	Approved
0	22/05/2026	FIRST ISSUE	AD	AB



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Drawing Status: FOR PLANNING

Project Title: CAIRNOCH HILL WIND FARM

Drawing Title: TECHNICAL APPENDIX 13.1 - ANNEX 1 - FIGURE 13.1.1

Scale:	Size:	Spatial Reference:
1:17,000	A3	British National Grid

Drawing Number: 16646-007

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Annex 2 – Noise Model Data

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Month 1 - Initial works begin on site with the upgrading of the original access road onto the Site, improving Site accessibility, alongside the felling of trees to clear turbine site locations.				
Access Road Improvements	Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Distribution of materials: Dumper Rolling & Compaction: Vibratory roller	C2.10 C2.14 C4.3 C5.20	Point Point Point Point	Site Entrance
Tree Clearance	Felling Harvester Felling Skidder Felling Forwarder	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment (14) (Forestry Commission)	Point Point Point	Turbines 1 & 2
Month 2 - Site Establishment commences and Access Road Improvements are temporarily completed. Initial Felling activities are completed.				
Access Road Improvements	Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Distribution of materials: Dumper Rolling & Compaction: Vibratory roller	C2.10 C2.14 C4.3 C5.20	Point Point Point Point	Site Entrance
Site Establishment	Haulage: Road lorry (full)	C6.21	Line	Along exisiting tracks within site to each Construction compound - 2 of
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Month 3 - Site Establishment continues with more deliveries arriving to site.				
Site Establishment	Haulage: Road lorry (full)	C6.21	Line	Along exisiting tracks within site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Month 4 - Site Establishment is completed and secondary felling activities are undertaken. The temporary construction compounds commence operation.				
Site Establishment	Haulage: Road lorry (full)	C6.21	Line	Along exisiting tracks within site
Tree Clearance	Felling Harvester Felling Skidder Felling Forwarder	Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment (14) (Forestry Commission)	Point Point Point	Turbine 4
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Month 5 - Access tracks from existing roads towards Turbine 1 (T1) are constructed.				
Access Track Construction	Rolling & Compaction: Vibratory roller Distribution of materials: Dumper Earthworks: Tracked excavator Spreading Chipping/fill: Dozer	C5.20 C4.3 C5.18 C5.13	Line Line Line Line	Along main access route, and along exisiting tracks to T1 - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Month 6 - Secondary Access Road Improvements begin at the Site entrance. Construction of Access tracks from existing roads towards Turbine 2 (T2) and Turbine 3 (T3), and construction of Crane Pad at T1. The borrow pit is opened.				
Access Road Improvements	Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Distribution of materials: Dumper Rolling & Compaction: Vibratory roller	C2.10 C2.14 C4.3 C5.20	Point Point Point Point	Site Entrance
Construction of Tracks	Rolling & Compaction: Vibratory roller Distribution of materials: Dumper Earthworks: Tracked excavator Spreading Chipping/fill: Dozer	C5.20 C4.3 C5.18 C5.13	Line Line Line Line	Between exisiting tracks at T1, T2 & T4
Construction of Crane Pads	Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Rolling & Compaction: Vibratory roller Distribution of materials: Dumper	C2.14 C2.10 C5.20 C4.3	Point Point Point Point	Turbine 1
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 7 - Secondary Access Road Improvements at the Site entrance and construction of Access Tracks from existing roads towards Turbine 4 (T4). Construction of Crane Pad at T2 alongside the beginning of construction of the Substation.				
Access Road Improvements	Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Distribution of materials: Dumper Rolling & Compaction: Vibratory roller	C2.10 C2.14 C4.3 C5.20	Point Point Point Point	Site Entrance
Construction of Crane Pads	Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Rolling & Compaction: Vibratory roller Distribution of materials: Dumper	C2.14 C2.10 C5.20 C4.3	Point Point Point Point	Turbine 2
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 8 - Turbine Foundation excavation at T1 alongside the construction of Crane Pad at T3.				
Construction of Crane Pads	Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Rolling & Compaction: Vibratory roller Distribution of materials: Dumper	C2.14 C2.10 C5.20 C4.3	Point Point Point Point	Turbine 3
Turbine Foundation Excavation	Ground Excavation/Earthworks: Dozer Distribution of materials: Dumper Ground Excavation/Earthworks: Tracked Excavator	C2.10 C4.3 C2.14	Point Point Point	Turbine 1
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 9 - Turbine Foundation excavation at T1 and construction of Crane Pads at T4.				
Construction of Crane Pads	Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Rolling & Compaction: Vibratory roller Distribution of materials: Dumper	C2.14 C2.10 C5.20 C4.3	Point Point Point Point	Turbines 4
Turbine Foundation Excavation	Ground Excavation/Earthworks: Dozer Distribution of materials: Dumper Ground Excavation/Earthworks: Tracked Excavator	C2.10 C4.3 C2.14	Point Point Point	Turbine 1
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 10 - Turbine Foundation construction at T1 and Turbine Foundation excavation at T2. Initial turbine deliveries begin.				
Turbine Foundation Excavation	Ground Excavation/Earthworks: Dozer Distribution of materials: Dumper Ground Excavation/Earthworks: Tracked Excavator	C2.10 C4.3 C2.14	Point Point Point	Turbine 2
Turbine Foundation Construction	Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck	C214 C4.20	Point Point	Turbine 1
Turbine Delivery	Haulage: Road lorry (full)	C6.21	Line	Access Tracks to Turbine 1 & 2
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 11 - Turbine Foundation construction at T2 and Turbine Foundation excavation at T3.				
Turbine Foundation Excavation	Ground Excavation/Earthworks: Dozer Distribution of materials: Dumper Ground Excavation/Earthworks: Tracked Excavator	C2.10 C4.3 C2.14	Point Point Point	Turbine 3
Turbine Foundation Construction	Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck	C214 C4.20	Point Point	Turbine 2
Turbine Delivery	Haulage: Road lorry (full)	C6.21	Line	Access Tracks to Turbine 3
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 12 - Turbine Foundation construction at T3 and Turbine Foundation excavation at T4. Turbine deliveries are completed.				
Turbine Foundation Excavation	Ground Excavation/Earthworks: Dozer Distribution of materials: Dumper Ground Excavation/Earthworks: Tracked Excavator	C2.10 C4.3 C2.14	Point Point Point	Turbine 4
Turbine Foundation Construction	Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck	C214 C4.20	Point Point	Turbine 3
Turbine Delivery	Haulage: Road lorry (full)	C6.21	Line	Access Tracks to Turbine 4
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 13 - Turbine Foundation construction at T4. Turbine Erection at T1.				
Turbine Foundation Construction	Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck	C214 C4.20	Point Point	Turbine 4
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Turbine Erection	Distribution of Material: Telescopic handler Concreting (Other): Mobile telescopic crane Concreting (Other): Tracked mobile crane	C2.35 C4.39 C4.50	Point Point Point	Turbine 1

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 14 - Turbine Erection at T2.				
Turbine Erection	Distribution of Material: Telescopic handler Concreting (Other): Mobile telescopic crane Concreting (Other): Tracked mobile crane	C2.35 C4.39 C4.50	Point Point Point	Turbine 2
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 15 - Turbine Erection at T3.				

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Turbine Erection	Distribution of Material: Telescopic handler Concreting (Other): Mobile telescopic crane Concreting (Other): Tracked mobile crane	C2.35 C4.39 C4.50	Point Point Point	Turbine 3
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Month 16 - Turbine Erection at T4, completion of the substation, and cessation of the borrow pit and temporary construction compounds.				
Turbine Erection	Distribution of Material: Telescopic handler Concreting (Other): Mobile telescopic crane Concreting (Other): Tracked mobile crane	C2.35 C4.39 C4.50	Point Point Point	Turbine 4

Scenario & Activity Description	Plant	Noise Source Reference	Source	Location
Substation - Civil & Electrical Works	Distribution of materials: Dumper Ground Excavation/Earthworks: Dozer Ground Excavation/Earthworks: Tracked Excavator Mixing concrete: Concrete mixer truck Haulage: Road lorry (full) Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	C4.3 C2.10 C2.14 C4.20 C6.21 C3.29	Point Point Point Point Point Point	Proposed Substation to the east of the Site
Operation of Construction Compounds	Power for Lighting: Diesel generator Ground Excavation/Earthworks: Tracked Excavator Power for site cabins: Diesel generator Distribution of Material: Articulated dump truck Distribution of Material: Telescopic handler Ground Excavation/Earthworks: Dozer	C4.86 C2.14 C4.76 C2.33 C2.35 C2.10	Point Point Point Point Point Point	Construction Compounds - 2 of
Operation of Borrow Pit	Breaking boulders/oversized material: Excavator mounted rock breaker Breaking boulders/oversized material: Tracked semi-mobile crusher Ground Excavation/Earthworks: Tracked Excavator Ground Excavation/Earthworks: Dozer Face shovel loading dump trucks: Wheeled loader	C9.12 C9.15 C2.14 C2.10 C9.7	Point Point Point Point Point	Borrow pit
Night-time - Diesel generators for power and lighting within the temporary construction compounds.				
Operation of Construction Compounds	Power for Lighting: Diesel generator Power for site cabins: Diesel generator	C4.86 C4.76	Point Point	Construction Compounds - 2 of

Noise Source Library – A-Weighted Sound Power Levels

Name	31.5	63	125	250	500	1k	2k	4k	8k	Overall (A-Weighted)	linear	Source
Forwarder				101					101	104.2		Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment (14) (Forestry Commission)
Harvester				103					103	106.2		
Skidder				108					108	111.2		
Ground Excavation/Earthworks: Dozer	117	118	109	101	102	98	96	92	108	121	117	BS 5228 Reference C2.10
Ground Excavation/Earthworks: Tracked Excavator	113	106	105	105	101	99	96	91	107	115.1	113	BS 5228 Reference C2.14
Distribution of Material: Articulated dump truck	113	115	105	103	104	101	97	90	108.5	117.8	113	BS 5228 Reference C2.33
Distribution of Material: Telescopic handler	113	107	97	95	92	90	84	75	98.5	114.1	113	BS 5228 Reference C2.35
Craneage for piling (lifting piles, casings, etc): Tracked mobile crane	109	105	97	95	90	88	89	79	97.8	110.8	109	BS 5228 Reference C3.29
Distribution of materials: Dumper	112	109	102	101	100	96	89	81	104.3	114.5	112	BS 5228 Reference C.4.3
Mixing concrete: Concrete mixer truck	111	102	94	97	98	106	88	83	108	112.9	111	BS 5228 Reference C.4.20
Concreting (Other): Mobile telescopic crane	115	110	106	102	99	95	88	80	104.6	116.8	115	BS 5228 Reference C.4.39

Name	31.5	63	125	250	500	1k	2k	4k	8k	Overall (A-Weighted)	linear	Source
Concreting (Other): Tracked mobile crane	96	99	96	90	94	94	83	74	98.6	103.4	96	BS 5228 Reference C.4.50
Power for site cabins: Diesel generator	108	102	85	82	81	76	73	65	89.4	109	108	BS 5228 Reference C.4.76
Power for Lighting: Diesel generator	106	99	94	90	87	83	84	77	93.5	107.2	106	BS 5228 Reference C.4.86
Spreading Chipping/fill: Dozer	110	112	104	103	106	104	98	90	109.9	115.7	110	BS 5228 Reference C.5.13
Earthworks: Tracked excavator	104	107	103	103	104	101	98	93	108.1	112.1	104	BS 5228 Reference C.5.18
Rolling & Compaction: Vibratory roller	118	110	101	100	98	93	87	82	103	118.8	118	BS 5228 Reference C.5.20
Haulage: Road lorry (full)	124	110	102	101	105	100	99	92	108.6	124.3	124	BS 5228 Reference C.6.21
Face shovel loading dump trucks: Wheeled loader	116	116	115	113	114	111	105	98	117.8	122.4	116	BS 5228 Reference C.9.7
Breaking boulders/oversized material: Excavator mounted rock breaker	119	117	113	117	115	115	112	108	121	124.5	119	BS 5228 Reference C.9.12
Breaking boulders/oversized material: Tracked semi-mobile crusher	119	119	116	115	113	111	106	96	118.1	124.3	119	BS 5228 Reference C.9.15

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A specialist energy consultancy

Technical Appendix 13.2

Operational Noise Report

Cairnoch Hill Wind Farm

Eurowind Energy Limited

16646-005-R3
27 July 2026

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Executive Summary

TNEI Services was commissioned by Eurowind Energy Limited ('the Applicant') to undertake predictions of the wind turbine noise that would be emitted by the operation of the proposed Cairnoch Hill Wind Farm (hereinafter referred to as 'the Proposed Development'). The noise predictions were used to assess the potential impact of operational noise from the Proposed Development on the nearest noise sensitive receptors.

On 19th June 2026, the UK Government published updated guidance for the *'Assessment and Rating of Wind Turbine Noise'* (hereafter referred to as ARWTN). The ARWTN guidance replaces the previous guidance ETSU-R-97 '*The Assessment and Rating of Noise from Wind Farms'* but is designed to be used alongside the good practice guidance produced by the Institute of Acoustics *'A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise'* (IOA GPG). The guidance contained in ARWTN and the IOA GPG has been used to assess the potential operational noise impact of the Proposed Development.

The operational noise assessment has been undertaken in three stages:

1) deriving the Total Noise Assessment Criteria (TNAC) (which are applicable to noise from all wind turbines in the area operating concurrently) at noise sensitive receptors;
2) predicting the likely effects (undertaking a cumulative noise assessment where required) to determine whether noise immission at noise sensitive receptors would meet the TNAC; and
3) deriving Site Specific Noise Limits for the Proposed Development (taking account of the guidance contained within ARWTN) and comparing predicted noise levels from the Proposed Development against those limits.

A total of eleven noise sensitive receptors were chosen as Noise Assessment Locations (NALs). Based on the guidance in ARWTN and to reflect the presence of existing wind turbines in the area, the daytime TNAC was set at 40 dBA. The night-time TNAC was set at 43 dBA. The TNAC do not vary as a function of background sound levels and standardised hub height wind speed (i.e. limits which are set using the Lower Limiting Values (LLV)). The reason for this is two-fold; firstly, it would be difficult to measure background sound levels at Noise Sensitive Receptors proximate to the Proposed Development which were not contaminated by noise from operational wind farms in the area; secondly, the existing baseline in the area, presented for some of those cumulative sites, was not used in deriving the TNAC for the Proposed Development, due to differences in the wind speed reference between the Proposed Development and the site for which it was measured for.

The daytime Site Specific Noise Limits associated with the Proposed Development have been calculated in accordance with ARWTN.

The exception to the setting of both the daytime and night-time Lower Limiting Values occurs where a property occupier has a financial involvement in the Proposed Development where the Lower Limiting Value can be increased to 45 dBA for both the daytime and night-time. For the purposes of this assessment it has been assumed that the occupiers of four properties are financially involved with the Proposed Development, and the occupiers of one other property are financially involved in a third party development.

Predictions of wind turbine noise for the Proposed Development were made, based upon the sound power level data for a candidate wind turbine, the Vestas V162 7.2 MW with serrated trailing edge blades, a hub height of 99m, and a tip height of 180m. This wind turbine model has been chosen as it is considered to be a representative worst case assumption for the type of turbine that could be

installed at the Site. Whatever the final turbine choice is, the Proposed Development would have to meet the noise limits determined and contained within any condition applied as part of the consent.

Modelling was undertaken using the ISO 9613: 2024 Acoustics – *'Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors'* noise prediction model which accords with current good practice and is considered to provide a realistic impact assessment. For the other schemes predictions have been undertaken using sound power level data for the installed turbines, or a suitable candidate.

A cumulative assessment was required at eight NALs. The likely cumulative assessment shows that the Proposed Development can operate concurrently with other operational, consented, and proposed (in planning) wind farms, whilst still meeting the TNAC at the receptors.

Site Specific Noise Limits have also been derived in accordance with ARWTN. Predicted noise levels indicate that at all assessed noise assessment locations, wind turbine noise immission were below the Site Specific Noise Limits when considering the Vestas V162 7.2 MW as a candidate turbine.

The use of Site Specific Noise Limits would ensure that the Proposed Development could operate concurrently with other proposed, consented or operational turbines in the area and would also ensure that the Proposed Development's individual contribution could be measured and enforced if required.

Should permission be granted for the Proposed Development it would be appropriate to include a set of noise related planning conditions, which detail the noise limits applicable to the Proposed Development.

There are a number of wind turbine makes and models that may be suitable for the Proposed Development. Should the Proposed Development receive consent the final choice of turbine would be subject to a competitive tendering process. As such, predictions of wind turbine noise are for information only. The final choice of turbine would, however, have to meet the noise limits determined and contained within any condition imposed.

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1 Introduction

1.1 Brief

1.1.1 TNEI was commissioned by the Applicant to undertake an operational noise assessment for the Proposed Development. The following steps summarise the noise assessment process:

- Determine the Total Noise Assessment Criteria (TNAC) applicable to all wind farms in the area in accordance with the UK Government Guidance *'Assessment and Rating of Wind Turbine Noise'* (hereafter referred to as ARWTN) (1) and *'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'* (2) (IOA GPG), which represents current good practice. Noise from the combined operation of all turbines in the area should not exceed the TNAC.
- Undertake a cumulative noise assessment, where required, to take account of other in-planning, consented or operational schemes near to the Proposed Development.
- Derive Site Specific Noise Limits for the Proposed Development, suitable for inclusion in a noise related planning condition. The Site Specific Noise Limits are set in accordance with ARWTN.
- Undertake predictions of the operational wind turbine noise immission from the Proposed Development that would be incident at neighbouring Noise Sensitive Receptors (NSRs).
- Compare the predictions of operational wind turbine noise from the Proposed Development against the Site Specific Noise Limits.
- Assess the impact of noise from the Proposed Development in accordance with ARWTN and the IOA GPG (current good practice).

1.2 Background

1.2.1 The Proposed Development is located on land ('the Site') at Cairnoch Hill, immediately (within 30m) north of the Carron Valley Reservoir, and approximately 5 km from the settlement of Fintry, Stirlingshire. The Site is located entirely within the administrative boundary of Stirling Council and is centred on National Grid Reference NS 69557 85797. The proposed layout is shown on Figure 13.2.1 in Annex 1.

1.2.2 In the absence of a confirmed turbine model, this noise assessment models a candidate turbine, the Vestas V162 7.2 MW with serrated trailing edge blades and a hub height of 99 m. This wind turbine model has been chosen as it is considered to be a representative worst case assumption for the type of turbine that could be installed at the Site.

1.2.3 The noise assessment has considered schemes that are within 10 km of the Proposed Development which are operational, consented and in-planning (planning application submitted), but not those in the pre-planning stage. The schemes considered in the assessment are summarised in Table 1.1.

Table 1.1 Cumulative Wind Farm/ Turbine Development

Wind Farm/ Wind Turbine	Number of Turbines	Status	Make and Model of Turbine considered in Modelling
Craigannet Farm	1	Operational	Vensys VE82, 1.5 MW
Craigengelt Wind Farm	8	Operational	Nordex N90, 2.5 MW
Earlsburn North Wind Farm	9	Operational	Nordex N90/2500HS, 2.5 MW
Earlsburn Wind Farm	20	Operational	Nordex N80, 2.5 MW
Earlsburn Extension Wind Farm	7	Consented	Vestas V117, 4.2 MW, with Serrated Blades & Vestas V136, 4.0 MW, with Serrated Blades
Shelloch Wind Farm	5	Consented	Vestas V150, 6.0 MW, with Serrated Blades & Vestas V136, 4.0 MW, with Serrated Blades
Drummarnock Wind Farm	4	In Planning	Nordex N163, 7 MW, with Serrated Blades

1.2.4 Figure 13.2.2 in Annex 1 shows the location of the above developments relative to the Proposed Development.

1.2.5 The Site Specific Noise Limits presented in this report for the Proposed Development have taken account the noise limits that have already been allocated to, or could potentially be used by, the other schemes in the area.

1.2.6 For the purposes of assessing the above scheme in conjunction with the Proposed Development, the following terms have been referred to throughout the assessment:

- 'Total Noise Assessment Criteria (TNAC); defined as being the limit that should not be exceeded from the cumulative operation of all wind farm developments, including the Proposed Development; and
- 'Site Specific Noise Limits'; defined as being the limit that is specific to the Proposed Development only, and derived in accordance with ARWTN.

1.2.7 Note that in this report, the term 'noise emission' relates to the sound power level radiated from each wind turbine, whereas the term 'noise immission' relates to the sound pressure level (the received noise) at any receptor location, due to the operation of the wind turbines. All references to dB are dBA unless otherwise stated. A full glossary of terms is provided in Section 8.

2 Noise Planning Policy and Guidance

2.1 Overview of Noise Planning Policy and Guidance

2.1.1 In assessing the potential noise impacts of the Proposed Development, the following sections consider guidance and policy documents used to inform this report:

- National Planning Policy;
- Local Planning Policy;
- Planning Advice Note PAN 1/2011: Planning and Noise;
- UK Government *'Assessment and Rating of Wind Turbine Noise'*; and
- Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IOA GPG).

2.2 National Planning Policy

2.2.1 As the Proposed Development has capacity to generate under 50 MW, the Proposed Development requires planning permission at local level from the Local Planning Authority, in this case Stirling Council.

2.2.2 Decision makers must consider national energy and planning policy and the statutory Development Plan. National Planning Framework 4 (NPF4)(3) forms part of the statutory Development Plan alongside the relevant Local Development Plan and any related supplementary guidance. Such plans will often contain policies tailored specifically to control certain kinds of development, and such policies should carry more weight and be more dominant in the minds of decision makers.

2.2.3 NPF4 was adopted on 13 February 2023 and supersedes National Planning Framework 3 and Scottish Planning Policy. Policy 11 – Energy states that renewable energy projects must be able to demonstrate how any noise impacts on communities have been addressed through the project's design and any associated mitigation. Policy 23 – Health and Safety outlines how 'development proposals that are likely to raise unacceptable noise issues will not be supported' and states that 'a Noise Impact Assessment may be required where the nature of the proposal or its location suggests that significant effects are likely.'

2.2.4 The Scottish Government published its Onshore Wind Policy Statement(4) on 21 December 2022. The statement outlines Scotland's commitment to the continued development and deployment of onshore wind as a key component of its transition to net zero and tackling the climate emergency. The Scottish Government's online Onshore Wind: Policy Statement 2022 (in Section 3.7) states that:

'The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments.'

2.2.5 The statement recognises the IOA GPG as a useful tool which supports the use of ETSU-R-97, stating:

'The Institute of Acoustics (IOA) Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise was published in May 2013 to support the use of ETSU-R-97 when designing potential windfarm schemes, and the monitoring of noise levels from generating sites. The Scottish Government recognises this guide as a useful tool which developers can use in conjunction with ETSU-R-97'.

2.2.6 In section 3.73 and 3.74 it notes that:

'*The Scottish Government is aware that the UK Government has been considering the extent to which ETSU-R-97 may require updating to ensure it is aligned with the potential effects from more modern turbines. The Scottish Government supports this work and we anticipate the results of a short-term review project in due course.*

Until such time as new guidance is produced, ETSU-R-97 should continue to be followed by applicants and used to assess and rate noise from wind energy developments.'

2.2.7 In relation to policy the ARWTN document itself states, in Section 1.12, that:

'Reference to ETSU-R-97 in UK planning policy or guidance should be interpreted to mean a reference to this technical guidance, which replaces ETSU-R-97.'

2.3 Planning Advice Note PAN 1/2011: Planning and Noise

2.3.1 PAN 1/2011 (5) provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. Paragraph 29 contains some specific information on noise from wind farms and states the following:

'There are two sources of noise from wind turbines - the mechanical noise from the turbines and the aerodynamic noise from the blades. Mechanical noise is related to engineering design. Aerodynamic noise varies with rotor design and wind speed, and is generally greatest at low speeds. Good acoustical design and siting of turbines is essential to minimise the potential to generate noise. Web based planning advice on renewable technologies for Onshore wind turbines provides advice on 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97) published by the former Department of Trade and Industry [DTI] and the findings of the Salford University report into Aerodynamic Modulation of Wind Turbine Noise.'

2.3.2 Whilst the web-based planning advice for onshore wind turbines has now been withdrawn, the Technical Advice Note (TAN) on the Assessment of Noise (6) that is associated with PAN 1/2011 notes that ETSU-R-97 is used throughout the UK to assess wind farm noise in planning applications. It goes on to provide relevant parameters for wind farm noise modelling as identified in an IOA Bulletin article in March 2009, although this has been superseded by the introduction of the IOA GPG in May 2013. As detailed above ARWTN has also superseded ETSU-R-97.

2.4 Local Policy

The Stirling Council Local Development Plan

2.4.1 The Stirling Council Local Development Plan (LDP)(7), adopted in October 2018, is the core land-use strategy for the Stirling Council area (excluding the Loch Lomond & The Trossachs

National Park). It sets out where development should and should not occur, how land should be used, and the policies that guide planning decisions for the lifetime of the plan.

2.4.2 Primary Policy 12 of the Stirling Council LDP relates to Renewable Energy. The policy is supportive of developments which contribute to the Scottish Government's energy generation and storage targets, should they comply with policies 12.1 or 12.2 (where appropriate), and with all other relevant LDP policies.

2.4.3 Policy 12.1 relates to wind energy developments, and Policy 12.2 relates to other renewable and low carbon energy developments. In considering proposals for wind energy development, Stirling Council would have regard to potential effects on residential amenity, including the likely effects of operational noise (inclusive of cumulative operational noise) on residential amenity.

2.4.4 Wind energy proposals are further informed by SC's Wind Energy Developments Supplementary Guidance(8), which sets out criteria for assessing siting, design and environmental impacts, including how to assess and rate noise from wind energy developments.

The Stirling Council Wind Energy Developments Supplementary Guidance

2.4.5 The Stirling Council Wind Energy Developments Supplementary Guidance states that the now withdrawn Scottish Government's Planning Advice Sheet - Onshore Wind Turbines (last updated May 2014) should be followed by applicants and consultees and used by planning authorities to assess and rate noise from wind energy developments.

2.4.6 The 'Onshore Wind Turbines' web-based document described the types of noise (mechanical and aerodynamic) that wind turbines generate. Mechanical noise is generated by the gearbox and generator and other parts of the drive train, which can be radiated as noise through the nacelle, gear box, tower and supporting structures, together with the aerodynamic noise generated by the action of the blades rotating through the air. The document stated '*there has been significant reduction in the mechanical noise generated by wind turbines through improved turbine* design' and goes on to note:

2.4.7 *'The Report, "The Assessment and Rating of Noise from Wind Farms" (Final Report, Sept 1996, DTI), (ETSU-R-97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available. This gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions.'*

2.4.8 Given the 'Onshore Wind Turbines' web-based document was withdrawn by the Scottish Government in December 2025, reference to the Scottish Government's online Onshore Wind: Policy Statement 2022 (in Section 3.7) has been made, which states that: '*The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments*.' As noted above ETSU-R-97 has now been replaced by ARWTN therefore ARWTN and current good practice guidance (IOA GPG) has been used to assess the potential operational noise impact of the Proposed Development.

2.5 Assessment and Rating of Wind Turbine Noise

2.5.1 On 19th June 2026, the UK Government Department of Energy Security and Net Zero (DESNZ) published guidance on the 'Assessment and Rating of Wind Turbine Noise' (ARWTN). The aim the document *'is to provide technical guidance to practitioners, developers, planners and other stakeholders on the environmental assessment and control of operational noise from wind turbines.'*

2.5.2 The guidance document was developed with advice from a group of wind turbine noise specialists which formed a Technical Advisory Team and was externally peer reviewed by a number of interested parties including, amongst others, Environmental Health professionals, representatives from the UK, Welsh, Scottish and Northern Irish Governments, the Institute of Acoustics, wind farm developers and independent acoustic consultants.

2.5.3 In this way it represented the views of a range of stakeholders that are involved in the assessment of noise impacts of wind farm developments.

2.5.4 The document is an update and replacement of the previous guidance ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms.' The aim of ARWTN is to provide:

'guidelines for the control of wind turbine noise, such that wind farm neighbours receive a reasonable degree of protection without placing unreasonable restrictions on wind farm development.'

2.5.5 The noise assessment criteria contained within ARWTN are *'consistent with the UK's statutory commitment to achieve net zero greenhouse gas emissions by 2050, supporting the deployment of renewable energy infrastructure while ensuring that potential adverse impacts on people are appropriately limited.'*

2.5.6 Where wind turbine noise is expected to be below 35 dB L_{A90}, background sound levels do not need to be recorded and a simplified Total Noise Assessment Criteria (TNAC) of 35 dBA up to wind speeds of 10 ms^{-1} can be used. In this regard ARWTN states that:

'a simplified total noise assessment criterion (TNAC) of 35 dB (up to a wind speed of 10 m/s) can be set without relating the assessment criteria to a margin above background sound levels. This applies during both day and night. This would not require the measurement of background sound levels. This criterion is particularly suitable for single or smaller scale turbines or cases where a large setback distance exists between turbines and neighbouring properties'

2.5.7 The ARWTN assessment procedure specifies that where wind turbine noise is expected to be above the simplified TNAC of 35 dB $L_{A90,}$ noise limits should be set relative to:

- a Lower Limiting Value (LLV) where background sound levels are low; or
- 5 dBA above the typical background sound levels determined in accordance with ARWTN.

2.5.8 Different LLVs apply during the day and night periods for noise sensitive receptors where the occupiers do not have a financial involvement with the wind farm development:

- For day periods, the LLV is set in the range from 35 to 40 dB.
- For night periods, the LLV is set to 43 dB.

2.5.9 The choice of daytime LLV in within the range 35-40 dB is determined based on three factors which consider the planning impacts and merits of the wind farm(s) in relation to noise. The three factors are presented below in priority order (i.e. the largest weight should be given to the first factor):

- *The generating capacity of the wind farm and the likely consequence that the choice of LLV would have on the energy generation of the wind farm(s).*
- *The number of dwellings in the neighbourhood of the wind farm(s) and the magnitude of the levels to which these are exposed.*
- *The duration and level of exposure to wind turbine noise of dwellings in the neighbourhood of the wind farm(s).*

2.5.10 The choice of daytime LLV should be considered in the national context (Scotland, England, Wales and Northern Ireland) *'as the range of wind energy projects, national policy priorities, and population density in practice can vary in each case.'* The three factors are discussed in further detail in Section 4.3 below.

2.5.11 The chosen LLV is applicable to all NSRs in the vicinity. The only exception being those NSRs where the occupier is financially involved with the wind farm development or a nearby scheme. In this regard, paragraph 2.29 of ARWTN states:

'The LLV used to define the noise assessment criteria can be increased to 45 dB for both day and night periods where the occupier (whether owner-occupiers or tenants) of the property has a financial involvement in the wind farm.'

2.5.12 The daytime noise assessment criteria is derived from background sound data measured during so-called 'quiet periods of the day', which comprise weekday evenings (18:00 to 23:00), Saturday afternoons and evenings (13:00 to 23:00) and all day and evening on Sundays (07:00 to 23:00).

2.5.13 Multiple samples of 10 minute background sound levels using the $L_{A90,10min}$ measurement index are logged continuously over a range of wind speed conditions. These measured noise levels are then plotted against concurrent wind speed data and a 'best fit' curve is fitted to the data to establish the background sound level as a function of wind speed. The TNAC, is then set at a level 5 dBA above the best fit curve over the 0 - 10 ms^{-1} wind speed range; subject to an appropriate daytime LLV.

2.5.14 The night-time noise limit is derived from background sound data measured during the night-time periods (23:00 to 07:00), with no differentiation being made between weekdays and weekends. The 10 minute L_{A90} noise levels measured over the night-time periods are plotted against concurrent wind speed data and a 'best fit' correlation is established. The night-time TNAC is also based on a level 5 dBA above the best fit curve over the 0 - 10 ms^{-1} wind speed range, with a LLV of 43 dB L_{A90}.

2.5.15 The TNAC is the limit to which all cumulative schemes need to operate within at each assessed NSR. A separate set of Site Specific Noise Limits (SSNLs) specific to a proposed

development then need to be derived. ARWTN provides guidance on the derivation of SSNLs and this is discussed in further detail in Section 4.5 below.

2.5.16 ARWTN provides a robust basis for determining noise limits to control wind turbine noise and is the accepted standard for such developments across the UK.

2.6 Current Good Practice

A Good Practice Guide on the Application of ETSU-R-97

2.6.1 In May 2013, the Institute of Acoustics issued A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IOA GPG). The document provides guidance on background data collection, data analysis and limit derivation, noise predictions, cumulative issues, reporting requirements and other matters such as noise related planning conditions.

2.6.2 The Authors of the IOA GPG sets out the scope of the document in Section 1.2:

'This guide presents current good practice in the application of the ETSU-R-97 assessment methodology for all wind turbine developments above 50 kW, reflecting the original principles within ETSU-R-97, and the results of research carried out and experience gained since ETSU-R-97 was published. The noise limits in ETSU-R-97 have not been examined as these are a matter for Government.'

2.6.3 The guidance document was endorsed, on behalf of Scottish Government by the Cabinet Secretary for Finance, Employment and Sustainable Growth (9). Accordingly, the recommendations included in the IOA GPG have been considered and applied throughout this noise assessment for the Proposed Development.

2.6.4 The ARWTN guidance is designed to be used alongside the IOA GPG. Following the publication of ARWTN, the IOA subsequently published a statement[1] regarding the IOA GPG, which stated:

'A replacement for ETSU-R-97 for the assessment and rating of wind turbine noise, has been published by the Government. The Assessment and Rating of Wind Turbine Noise (ARWTN), endorses good practice guidance produced by the Institute of Acoustics. In this refreshed guidance, noise limits have not changed, and assessment principles are generally the same as before. The ARWTN does introduce new terminology and clarifications.

For the assessment of wind turbine noise IOA have set out a statement advising on good practice, and practitioners should continue to use the IOA Good Practice Guide published in 2013, alongside the six 2014 Supplementary Guidance Notes. These cover the following technical areas: SGN 1: Data Collection; SGN 2: Data Processing & Derivation of ETSU-R-97 Background Noise Curves; SGN 3: Sound Power Level Data; SGN 4: Wind Shear; SGN 5: Post Completion Measurements; SGN 6: Noise Propagation Over Water, until updates are issued later this year.'

[1] Available at https://www.ioa.org.uk/news/wind-turbine-noise-assessment-guidance-arwtn-replaces-etsu97 (last accessed 03/07/2026).

2.6.5 The guidance contained within ARWTN and the IOA GPG has therefore been used to assess and rate the operational noise immissions from the Proposed Development.

3 Potential Impacts

3.1 Operational Noise Sources

3.1.1 Wind turbines may emit two types of noise. Firstly, aerodynamic noise is a more natural sounding 'broad band' noise, albeit with a characteristic modulation, or 'swish', which is produced by the movement of the rotating blades through the air. Secondly, mechanical noise may emanate from components within the nacelle of a wind turbine. Potential sources of mechanical noise include gearboxes or generators.

3.1.2 Aerodynamic noise is usually perceived when the wind speeds are fairly low, although at very low wind speeds the blades do not rotate, or rotate very slowly, and so negligible aerodynamic noise is generated. In higher winds, aerodynamic noise may be masked by the normal sound of wind blowing through the trees and around buildings. The level of this natural 'masking' noise relative to the level of wind turbine noise is one of the several factors that determine the subjective audibility of the wind turbines (11).

3.2 Infrasound, Low Frequency Noise (LFN) and Vibration

3.2.1 The term infrasound can be defined as the frequency range below 20 Hz, while low frequency noise (LFN) is typically in the frequency range 20 – 200 Hz (12). An average young healthy adult has an audible range from 20 Hz to 20,000 Hz, although the sensitivity of the ear varies with frequency and is most sensitive to sounds with frequencies between 500 Hz and 4,000 Hz. Wind turbines do produce low frequency sounds (13), but our threshold of hearing at such low frequencies is relatively high and they therefore go unnoticed. Infrasound from wind turbines is often at levels below that of the noise generated by wind around buildings and other obstacles.

3.2.2 In 2004, the former DTI commissioned The Hayes McKenzie Partnership to report on claims that infrasound or LFN emitted by wind turbine generators (WTGs) were causing health effects. Of the 126 wind farms operating in the UK, five had reported LFN problems, therefore, such complaints are an exception, rather than a general problem that exists for all wind farms. Hayes McKenzie investigated the effects of infrasound and LFN at three wind farms for which complaints had been received, and the results were reported in May 2006 (14). The report concluded that:

- *'infrasound associated with modern wind turbines is not a source which will result in noise levels which may be injurious to the health of a wind farm neighbour;*
- *low frequency noise was measurable on a few occasions but below the existing permitted Night Time Noise Criterion. Wind turbine noise may result in internal noise levels within a dwelling that is just above the threshold of audibility, however at all sites it was always lower than that of local road traffic noise;*
- *that the common cause of complaint was not associated with LFN, but the occasional audible modulation of aerodynamic noise especially at night. Data collected showed that the internal noise levels were insufficient to wake up residents at these three sites. However once awoken, this noise can result in difficulties in returning to sleep.'*

3.2.3 The Applied and Environmental Geophysics Research Group at Keele University was commissioned by the Ministry of Defence (MOD), the DTI and the British Wind Energy Association (BWEA) to undertake microseismic and infrasound monitoring of LFN and vibrations from wind farms for the purposes of siting wind farms in the vicinity of Eskdalemuir in Scotland. Whilst the testing showed that vibration can be detected several kilometres away from wind turbines, the levels of vibration from wind turbines were so small that only the most sophisticated instrumentation can reveal their presence, and they are almost impossible to detect. Nevertheless, the Renewable Energy Foundation alleged potential adverse health effects and when that story was picked up in the popular press, notably the Scotsman, the report's authors expressed concern over the way in which their work had been misinterpreted and issued a rebuttal statement (15) in August 2005:

'Vibrations at this level and in this frequency range will be available from all kinds of sources such as traffic and background noise – they are not confined to wind turbines. To put the level of vibration into context, they are ground vibrations with amplitudes of about one millionth of a millimetre. There is no possibility of humans sensing the vibration and absolutely no risk to human health.'

3.2.4 In response to concerns that wind turbines emit infrasound and cause associated health problems, Dr Geoff Leventhall, Consultant in Noise Vibration and Acoustics and author of the Department for Environment, Food & Rural Affairs (Defra) Report called Low Frequency Noise and its Effects, said in the article in the Scotsman ('Wind farm noise rules 'dated'- James Reynolds, 5 August 2005') (16):

'I can state quite categorically that there is no significant infrasound from current designs of wind turbines.'

3.2.5 An article (17) published in the IOA Bulletin (March/April 2009) concluded that there is no robust evidence that either low frequency noise (including 'infrasound') or ground-borne vibration from wind farms, has an adverse effect on wind farm neighbours.

3.2.6 Work (18) by Dr Leventhall looked at infrasound levels within the ear compared to external sources and concluded:

'The conclusion is that the continuous inner ear infrasound levels due to internal sources, which are in the same frequency range as wind turbine rotational frequencies, are higher than the levels produced in the inner ear by wind turbines, making it unlikely that the wind turbine noise will affect the vestibular systems, contrary to suggestions made following the measurements at Shirley. The masking effect is similar to that in the abdomen (Leventhall 2009). The body, and vestibular systems, appear to be built to avoid disturbance from the high levels of infrasound which are produced internally from the heartbeat and other processes. In fact, the hearing mechanisms and the balance mechanisms, although in close proximity, have developed to minimise interaction (Carey and Amin 2006).'

3.2.7 More recently, during a planning appeal (PPA-310-2028, Clydeport Hunterston Terminal Facility, 9 Jan 2018), the health impacts related to LFN associated with wind turbines were considered at length by the appointed Reporter. The Reporter considered evidence from Health Protection Scotland and the National Health Service (NHS). In addition, he also considered LFN surveys undertaken by the Appellant and the Local Authority, both of which demonstrated compliance with planning conditions and did not identify any problems

attributable to the turbine operations; some periods with highest levels of low frequency noise were in fact recorded when the turbines were not operating.

3.2.8 The Reporter concluded that:

- The literature reviews by bodies with very significant responsibilities for the health of local people found insufficient evidence to confirm a causal relationship between wind turbine noise and the type of health complaints cited by some local residents;
- The NHS's assessment is that concerns about health impact are not supported by good quality research; and
- Although given the opportunity, the Community Council failed to provide evidence that can properly be set against the general tenor of the scientific evidence.

3.2.9 In February 2023, WSP published 'A review of noise guidance for onshore wind turbines' (10) ('WSP BEIS report'). The WSP BEIS Report notes on page 113 that:

'Several studies have investigated the claimed links between adverse health symptoms and infrasound emissions from wind turbines. Although some experimental studies have linked infrasonic signals with activation of physiological sensory processing, these have tended to be based on signals that are not representative of wind turbine infrasound. There remains no compelling evidence of adverse health effects associated with wind turbine infrasound exposure at sound frequencies and levels expected to be present at noise-sensitive receptor locations in the vicinity of wind farms'

3.2.10 The WSP BEIS Report goes on to note on page 114 that:

'Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin.'

3.2.11 It is noted that research into infrasound is ongoing but the WSP BEIS report concluded that:

'It is expected that further evidence from ongoing studies into wind turbine infrasound effects will emerge soon, in particular from the NHMRC studies in Australia. However, based on the existing scientific evidence, it does appear probable that the above findings will not be contradicted by newer evidence.'

3.2.12 Since the publication of the WSP BEIS report, the National Health and Medical Research Council of Australia (NHMRC) study was presented in the Environmental Health Perspectives (EHP) journal, which is published by the United States National Institute of Environmental Health. The study(19) aimed to test the effect of exposure to 72 hours of infrasound (designed to simulate a wind turbine infrasound signature) exposure on human physiology, particularly sleep. The study concluded that:

'Our findings did not support the idea that infrasound causes WTS[2]. High level, but inaudible, infrasound did not appear to perturb any physiological or psychological measure tested in these study participants.'

[2] WTS stands for Wind Turbine Syndrome which is a term for adverse human health effected related to the proximity of wind turbines.

3.2.13 LFN and Infrasound was also discussed in detail at the co-joined Inquiry for three wind farms at Craiginmoddie (WIN-370-4), Carrick (WIN-370-5) and Knockcronal (WIN-370-6); the decision letters for which were issued on 5 November 2025. On low frequency noise/ infrasound, the Reporter stated that:

"206. Based on existing guidance, we consider there is no requirement to impose planning conditions to monitor/control infrasound or low frequency sound or related vibration. It would be unreasonable, without policy direction, to impose conditions as a precaution. In coming to that conclusion, we are also aware that 'A' weighted sound levels in ETSU-R-97 assessments are said (in the guidance) to provide sufficient control over impacts of low frequency noise. This is backed by the WSP BEIS report."

207. Based on the above, we do not consider that significant effects can be predicted relating to infrasound/low frequency sound or that mitigation by planning conditions is necessary.'

3.2.14 Furthermore, the UK Government Department for Energy Security & Net Zero document titled 'National Policy Statement for Renewable Energy Infrastructure (EN-3)' states the following in respect of infrasound and LFN.

"2.12.165 There is currently no evidence that ground transmitted vibration, infrasound or low frequency noise from wind turbines occurs at a sufficient level to be harmful to human health. Therefore, the Secretary of State should give no weight to claims of harm to human health as a result of ground transmitted vibration, infrasound or low frequency noise."

3.2.15 ARWTN sets out (Section 1.20) that there are:

'a number of aspects of wind turbine noise that do not require assessment at the planning stage because their effects on humans can be considered negligible or suitably controlled by the criteria set out in this guidance. These include infrasound, ground-borne vibration and low frequency sound.'

3.2.16 It is therefore not considered necessary to carry out specific assessments of LFN and/ or infrasound and they have not been considered further in the noise assessment.

3.3 Amplitude Modulation of Aerodynamic Noise (AM)

3.3.1 In the context of wind turbine noise, amplitude modulation (AM) describes a variation in noise level over time; for example, observers may describe a 'whoosh whoosh' sound, which can be heard close to a wind turbine as the blades sweep past. AM of aerodynamic noise is an inherent characteristic of wind turbine noise and was noted in ETSU-R-97, on page 68:

'The modulation or rhythmic swish emitted by wind turbines has been considered by some to have a characteristic that is irregular enough to attract attention. The level and depth of modulation of the blade noise is, to a degree, turbine-dependent and is dependent upon the position of the observer. Some wind turbines emit a greater level of modulation of the blade noise than others. Therefore, although some wind turbines might be considered to have a character that may attract one's attention, others have noise characteristics which are considerably less intrusive and unlikely to attract one's attention and be subject to any penalty.

This modulation of blade noise may result in a variation of the overall A-weighted noise level by as much as 3dBA (peak to trough) when measured close to a wind turbine. As distance from the wind turbine [or] wind farm increases, this depth of modulation would be expected to decrease as atmospheric absorption attenuates the high frequency energy radiated by the blade.'

3.3.2 In recent times the acoustics community has sought to make a distinction between the AM discussed within ETSU-R-97, which is expected at most wind farms and as such may be considered as 'Normal Amplitude Modulation' (NAM), compared to the unusual AM that has sometimes been heard at a small number of wind farms, hereinafter referred to as 'Other Amplitude Modulation' (OAM). The term OAM is used to describe an unusual feature of aerodynamic noise from wind turbines, where a greater than normal degree of regular fluctuation in sound level occurs at blade passing frequency, typically once per second. In some appeal decisions it has also been referred to as 'Excess Amplitude Modulation' (EAM). It should be noted that the noise assessment and rating procedure detailed in ETSU-R-97 fully takes into account the presence of the intrinsic level of NAM when setting acceptable noise limits for wind farms.

3.3.3 On 16 December 2013, RenewableUK (RUK) released six technical papers (20) on AM, which reflected the outcomes of research commissioned over the previous three years, together with a template planning condition. Whilst this research undoubtedly improved understanding of OAM and its effects, it should be noted that at the time of writing it has not been endorsed by any relevant body such as the IOA.

3.3.4 On 22 January 2014, the IOA released a statement regarding the RUK research and the proposed planning condition to deal with the issue of AM from a wind turbine and stated:

'This research is a significant step forward in understanding what causes amplitude modulation from a wind turbine, and how people react to it. The proposed planning condition, though, needs a period of testing and validation before it can be considered to be good practice. The IOA understands that RenewableUK will shortly be making the analysis tool publicly available on their website so that all interested parties can test the proposed condition, and the IOA will review the results later in the year. Until that time, the IOA cautions the use of the proposed planning condition.'

3.3.5 Research regarding AM continued. In April 2015, the IOA issued a discussion document entitled '*Methods for Rating Amplitude Modulation in Wind Turbine Noise*' (21). The document presented three methods that can be used to quantify the level of AM at a given measurement location. After extensive consultation a preferred method of measuring OAM, which provides a framework for practitioners to measure and rate AM, was recommended by the IOA.

3.3.6 On 3 August 2015, the Department for Energy and Climate Change (DECC), commissioned independent consultants WSP Parsons Brinkerhoff to carry out a literature review on OAM (which they refer to simply as AM). The stated aims were as follows:

- *'To review the available evidence on Amplitude Modulation (AM) in relation to wind turbines, including but not limited to the research commissioned and published by RenewableUK in December 2013;*

- *To work closely with the Institute of Acoustics' AM working group, who are expected to recommend a preferred metric and methodology for quantifying and assessing the level of AM in a sample of wind turbine noise data;*
- *To review the robustness of relevant dose response relationships, including the one developed by the University of Salford as part of the RenewableUK study, on which the correction (or penalty) for amplitude modulation proposed as part of its template planning condition is based;*
- *To consider how, in a policy context, the level(s) of AM in a sample of noise data should be interpreted, in particular determining at what point it causes a significant adverse impact;*
- *To recommend how excessive AM might be controlled through the use of an appropriate planning condition; and*
- *To consider the engineering/cost trade-offs of possible mitigation measures.'*

3.3.7 Their report(22), which was released in October 2016, concluded that there is sufficient robust evidence that excessive AM leads to increased annoyance from wind turbine noise and recommended that excessive AM is controlled through a suitably worded planning condition, which would control it during periods of complaint. Those periods should be identified by measurement using the metric proposed by the work undertaken by the IOA, and enforcement action would rely upon professional judgement by Local Authority Environmental Health Officers (EHOs) based on the duration and frequency of occurrence.

3.3.8 It is not clear within the body of the report which evidence the authors relied upon to arrive at their conclusions, although the executive summary states (page 4);

'It is noted that none of the Category 1 or 2 papers have been designed to answer the main aim of the current review in its entirety. The Category 1 studies have limited representativeness due to sample constraints and the artificiality of laboratory environments, whereas the Category 2 studies generally do not directly address the issue of AM WTN exposure-response. A meta - analysis of the identified studies was not possible due to the incompatibility of the various methodologies employed. Notwithstanding the limitations in the evidence, it was agreed with DECC that the factors to be included in a planning condition should be recommended based on the available evidence, and supplemented with professional experience'.

3.3.9 The report states that any planning condition must accord with existing planning guidance and should be subject to legal advice on a case-by-case basis. Existing guidance would include compliance with the six tests of a planning condition embodied in Circular 4/98. The report's authors did not dictate a particular condition to be used but did suggest that any condition should include the following elements (p5):

- '*The AM condition should cover periods of complaints (due to unacceptable AM);*
- *The IoA-recommended metric should be used to quantify AM (being the most robust available objective metric);*
- *Analysis should be made using individual 10-minute periods, applying the appropriate decibel 'penalty' to each period, with subsequent bin-analysis;*
- *The AM decibel penalty should be additional to any decibel penalty for tonality; and*

- *An additional decibel penalty is proposed during the night-time period to account for the current difference between the night and day limits on many sites to ensure the control method works during the most sensitive period of the day, i.e. the night-time period (this addition would not apply to situations in which other planning conditions dictate the limits to be set as lower for night-time than for daytime);*
- *Professional judgement should be used for planning enforcement of the AM condition in terms of frequency and duration of breaches identified; and*
- *The condition is only designed for upwind, 3-bladed turbines with rotational speeds up to approximately 32 RPM. Further research is needed for turbines with higher rotational speeds or greater numbers of blades.'*

3.3.10 AM was also considered in the WSP BEIS report (10). The report notes that the IOA method provides a suitable approach to measure and quantify AM (whilst noting that work is ongoing to refine the approach) but also highlights that further work is required to develop a robust mechanism for controlling AM that could be incorporated into a planning condition. In relation to the potential adoption of a penalty scheme to control AM the WSP BEIS report notes on page 206 that:

'In practice, the details of applying such a penalty scheme are complicated by the complexities of wind turbine sound measurements. These often involve a considerable amount of data filtering and data aggregation to address the practical difficulties of measuring a highly variable source, which is often also at a level that is relatively low compared with other, fluctuating residual sounds present in the acoustic environment. Such details will need to be carefully considered in further study, and the example planning condition proposed by a group of IOA members in 2017 should be considered as a starting point.'

3.3.11 ARWTN confirms (para 2.8) that:

'All wind turbines generate AM (or blade swish, to a limited extent), but the occurrence of elevated levels of AM is a complex phenomenon that is likely to be related to a combination of turbine and site characteristics; the current consensus is that AM cannot be predicted.'

3.3.12 In relation to control of AM, should it occur, the guidance states (para 2.8) that:

'Tonal noise and AM are therefore best controlled through enforcement of planning conditions which include the application of character corrections as described in section 4. The approach set out in this technical guidance is formulated on this basis, and consequently, character corrections should only be applied to compliance measurements and should not be added at the planning/application assessment phase, unless there is strong evidence to do so.'

3.3.13 The example planning condition included within ARWTN includes a penalty for AM (should it occur).

4 Methodology

4.1 Assessing Operational Noise Impact

4.1.1 To undertake an assessment of the operational noise impact in accordance with the requirements of ARWTN and the IOA GPG, the following steps are required:

- Specify the location of the wind turbines for the Proposed Development;
- Identify the locations of all nearby NSRs and select a sample of relevant Noise Assessment Locations (NALs);
- Establish the TNAC for each NAL;
- Specify the likely noise emission levels of the wind turbines for the Proposed Development and all nearby cumulative wind turbines;
- Calculate the likely noise immission levels due to the cumulative operation of all relevant wind turbines and compare it to the TNAC;
- Determine the Site Specific Noise Limits in accordance with ARWTN; and
- Calculate the likely noise immission levels due to the operation of the Proposed Development on its own and compare it to the Proposed Development's Site Specific Noise Limits.

4.1.2 In order to consider the steps outlined above the assessment has been split into three separate stages:

- Stage 1 – determine the TNAC (which are applicable to noise from all wind turbines in the area operating concurrently) at the NALs;
- Stage 2 – undertake a cumulative assessment, where noise predictions from the Proposed Development are within 10 dB of the total noise predictions from the other wind farms/turbines within the area; and
- Stage 3 – establish the Proposed Development's Site Specific Noise Limits (at levels below the TNAC in accordance with ARWTN) and compare the noise predictions from the Proposed Development on its own against these limits.

4.1.3 There are a range of turbine makes and models that may be appropriate for the Proposed Development, therefore, the assessment is based upon an appropriate candidate model only (the Vestas V162 7.2 MW, with a hub height of 99 m and with serrated trailing edge blades). The final selection of turbine would follow a competitive tendering process, so the final turbine model may differ from that upon which this assessment has been based. However, the final choice of turbine would still be required to comply with the noise limits that have been established for the Site.

4.2 Consultation

Scoping Opinion (dated October 2024)

4.2.1 Within the Scoping Report, it was proposed that the Operational wind turbine noise be scoped into the assessment.

4.2.2 It was proposed that the following elements were scoped out of the assessment:

- LFN; and
- AM.

4.2.3 In the Scoping Opinion, Stirling Council stated the following:

4.2.4 *'The Council's Environmental Health Team agree with the approach to assessing operational and constructional noise. They also raise no significant concerns in relation to decommissioning noise and works vibrations. Low Frequency Noise and Amplitude Modulation is more difficult to assess, therefore specialist advice would be sought from their peer review consultants at the time of an application being made.'*

4.2.5 LFN and AM are discussed in detail in Sections 3.2 and 3.3. It has been deemed appropriate that they not be considered further in this assessment.

Consultation with Stirling Council EHO (February 2025)

4.2.6 Prior to the commencement of the noise impact assessment for the Proposed Development, direct consultation was undertaken with the EHO at Stirling Council to agree the approach to the noise assessment.

4.2.7 An EHO from Stirling Council responded to the email agreeing with the assessment methods outlined, which included the use of BS 5228, ETSU-R-97 (now replaced by ARWTN) and the IOA GPG.

4.2.8 Other aspects proposed within the consultation letter included the use of upper daytime Lower Limiting Value (previously known as Fixed Minimum Limit) of 40 dBA, and 43 dBA during the night-time, and that fixed TNAC (previously known as Total ETSU-R-97 Noise Limits) are appropriate given it would have been difficult to conduct a baseline survey due to existing operational wind farms in the area.

4.2.9 A copy of the original consultation letter is included in Annex 2. The response from Stirling Council EHO is detailed below:

- *"It is agreed that operational phase wind turbine noise assessment for the Proposed Development should be carried out in accordance with ETSU-R-97 The assessment and rating of noise from wind farms (ETSU-R-97) and the Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 (IoA GPG).*
- *The challenges of carrying a baseline noise survey due to existing operational wind farms are acknowledged. In turn, it is agreed that fixed cumulative wind turbine noise limits of 40 dB $L_{A90,10\ mins}$ during the quiet daytime period and 43 dB $L_{A90,10\ mins}$ during the night-time period are appropriate.*
- *It is agreed that the Site Specific Noise limits should be determined in accordance with the guidance set out in the IOA GPG and taking into account existing operational, consented and proposed wind farm development which are acoustically relevant. The assessment should provide justification for scoping out any existing, consented and/or proposed wind farm development within 5km of the proposed red line boundary.*
- *Figure 1 includes the current existing operational, consented and proposed wind farm developments within 5km of the Proposed Development. However, it should be noted that there may be changes to the consented and/or proposed wind farms prior to the submission of the noise assessment for the Carron Valley Wind Farm. It is also*

recommended that the Further Environmental Information for the Earlsburn Wind Farm Extension (23/00092/NST) is reviewed to ensure the assessment takes account of the latest layout proposed for this development.

- *The methodology only sets out the assessment for the operational phase wind turbine noise assessment. There is no reference to potential operational phase impacts relating to fixed plant associated with the Proposed Development, such as proposed substation(s). The assessment should assess the noise from fixed plant at nearby noise sensitive receptors in accordance with BS 4142:2014+2019 Methods for rating and assessing industrial and commercial sound, or provide the justification for this element of the operational phase assessment being scoped out.*

4.3 Setting the Total Noise Assessment Criteria (Stage 1)

Noise Impact Criteria in ARWTN

4.3.1 The daytime and night-time TNAC, which would apply for the cumulative operation of all wind turbines in the area, have been established for each NAL. The TNAC for the daytime have been set at 40 dBA; and the TNAC at night-time have been set at 43 dBA. This 'Total' limit relates to noise from all wind farm developments in the area. The limit was chosen with due regard to the guidance in ARWTN.

4.3.2 ARWTN suggests that the daytime Lower Limiting Values (LLV) should be set in the range between 35 - 40 dBA. The precise choice of criterion level depends on a number of factors:

- *'The generating capacity of the wind farm and the likely consequence that the choice of LLV would have on the energy generation of the wind farm(s).'*
- *'The number of dwellings in the neighbourhood of the wind farm(s) and the magnitude of the levels to which these are exposed.'*
- *'The duration and level of exposure to wind turbine noise of dwellings in the neighbourhood of the wind farm(s).'*

4.3.3 Depending on the levels of background sound, the satisfaction of the ARWTN derived limits can lead to a situation whereby, at some locations and under certain wind conditions, wind turbine noise could be audible for a proportion of the time. Acceptable limits for wind turbine operational noise, however, are clearly defined for all time periods by the application of the ARWTN methodology and consequently, the test applied to operational noise is whether or not the predicted wind turbine noise immission levels lie below the ARWTN noise limits, rather than whether or not they are audible.

4.4 Assessment of Likely Effects and the Requirement for a Cumulative Assessment (Stage 2)

4.4.1 The IOA GPG (2013) includes a detailed section on cumulative noise and provides guidance on where a cumulative assessment is required. Section 5.1.4 and 5.1.5 of the GPG state:

'During scoping of a new wind farm development consideration should be given to cumulative noise impacts from any other wind farms in the locality. If the proposed wind farm produces noise levels within 10 dB of any existing wind farm/s at the same receptor location, then a cumulative noise impact assessment is necessary.

Equally, in such cases where noise from the proposed wind farm is predicted to be 10 dB greater than that from the existing wind farm (but compliant with ETSU-R-97 in its own right), then a cumulative noise impact assessment would not be necessary.'

4.4.2 An assessment was undertaken at each of the NSRs proximate to the Proposed Development, to determine whether the wind turbine noise immission from the Proposed Development were within 10 dB of the immission levels from the other schemes. Where predictions were found to be within 10 dB of each other, then a cumulative noise assessment was undertaken to determine the likely cumulative impact, however, if wind turbine immission were more than 10 dB apart, a cumulative noise assessment was not required.

Noise Predictions/Propagation Model

4.4.3 Modelling was undertaken using the methodology presented in ISO 9613:2024 Acoustics – Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors (24).

4.4.4 The ISO 9613-2 model can take account of the following factors that influence sound propagation outdoors:

- Geometric divergence;
- Atmospheric absorption;
- Reflecting obstacles;
- Screening;
- Vegetation; and
- Ground attenuation.

4.4.5 The model uses as its acoustic input data the octave band sound power output of the turbine and calculates, on an octave band basis, attenuation due to the factors above, as appropriate.

4.4.6 There is currently no standard approach to specifying error bands for wind turbine noise predictions, however, Table 4 of ISO 9613-2 suggests an estimation of accuracy for downwind conditions of ± 3 dBA for calculations of up to 1000 m for broadband noise levels.

4.4.7 The ISO 9613-2 noise model is intended for the modelling of many noise source types and was not written specifically for the modelling of wind turbine noise, however, a number of studies have been undertaken to determine the standard's accuracy for wind turbine noise predictions and some amendments to the propagation model have been widely adopted for the modelling of wind turbine noise in the UK, primarily through the incorporation of recommendations in the IOA GPG.

4.4.8 In 1998, a European Commission (EC) research project into wind farm noise propagation over large distances, published 'Development of a Wind Farm Noise Prediction Model,' JOULE project JOR3-CT95-0051, which identified a simplified version of ISO 9613-2 as the most suitable prediction method at that time (25).

4.4.9 Additional wind farm specific studies have also been undertaken to validate the use of the standard and these are referenced in Section 4 of the IOA GPG, which goes on to conclude that: *'The outcome of this research has demonstrated that the ISO 9613-2 standard in*

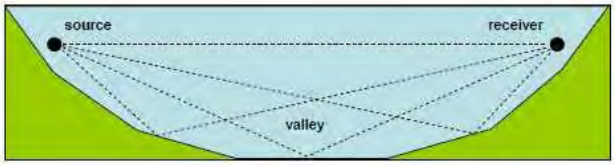
particular, which is widely used in the UK, can be applied to obtain realistic predictions of noise from on-shore wind turbines during worst case propagation conditions (i.e. sound speed gradients due to downwind conditions or temperature inversions), but only provided that the appropriate choice of input parameters and correction factors are made.'

4.4.10 It should be noted that the IOA GPG references the 1996 version of the 9613 standard, which was updated in 2024, however, use of either version when adopting the IOA GPG amendments to the noise model, results in negligible differences in predicted noise levels.

4.4.11 TNEI's experience of undertaking compliance monitoring for operational wind farms also indicates that noise predictions undertaken using ISO 9613-2, whilst following the guidance in the IOA GPG, show a good correlation with measured noise levels, with predicted levels usually slightly higher than measured levels.

4.4.12 The IOA GPG quotes a comparative study undertaken in Australia that indicated ISO 9613-2 can, in some conditions, under-predict ground attenuation effects and the potential for additional reflection paths 'across a valley', whilst slightly over-predicting wind turbine noise on flat terrain (26). With due regard to this study, the IOA GPG states that a '*further correction of +3 dB should be added to the calculated overall A-weighted level for propagation 'across a valley, i.e. a concave ground profile or where the ground falls away significantly between a turbine and the receiver location.*' The potential reflection paths are illustrated in Schematic 4.1 below.

Schematic 4.1: Multiple reflection paths for sound propagation across concave ground



Source: IOA GPG, page 21, Figure 5

4.4.13 A formula from the aforementioned JOULE Project is suggested for determining whether the +3 dB correction is required.

$$hm \geq 1.5 \times (abs\ (hs - hr) / 2)$$

4.4.14 Where hm is the mean height above the ground of the direct line of sight from the receiver to the source (as defined in ISO 9613-2, Figure 3), and hs and hr are the heights above local ground level of the source and receiver respectively).

4.4.15 The calculation of hm requires consideration of the digital terrain model and needs to be performed for each path between every turbine and every receiver. Interpretation of the results of the calculation above, and the subsequent inclusion of a concave ground profile correction, requires careful consideration with any topographical variation considered in the context of a site.

4.4.16 The IOA GPG also discusses the potential for topographical screening effects of the terrain between a wind farm and nearby NSRs (barrier attenuation), and although screening from barriers in ISO 9613-2 can provide attenuation of up to 15 dB, the IOA GPG states that where

there is no line of sight between the highest point on the rotor and the receiver location, a reduction of no more than 2 dB should be applied.

4.4.17 All of the modelling parameters used in this assessment are detailed in Section 6.3.

4.5 Setting the Site Specific Noise Limits (Stage 3)

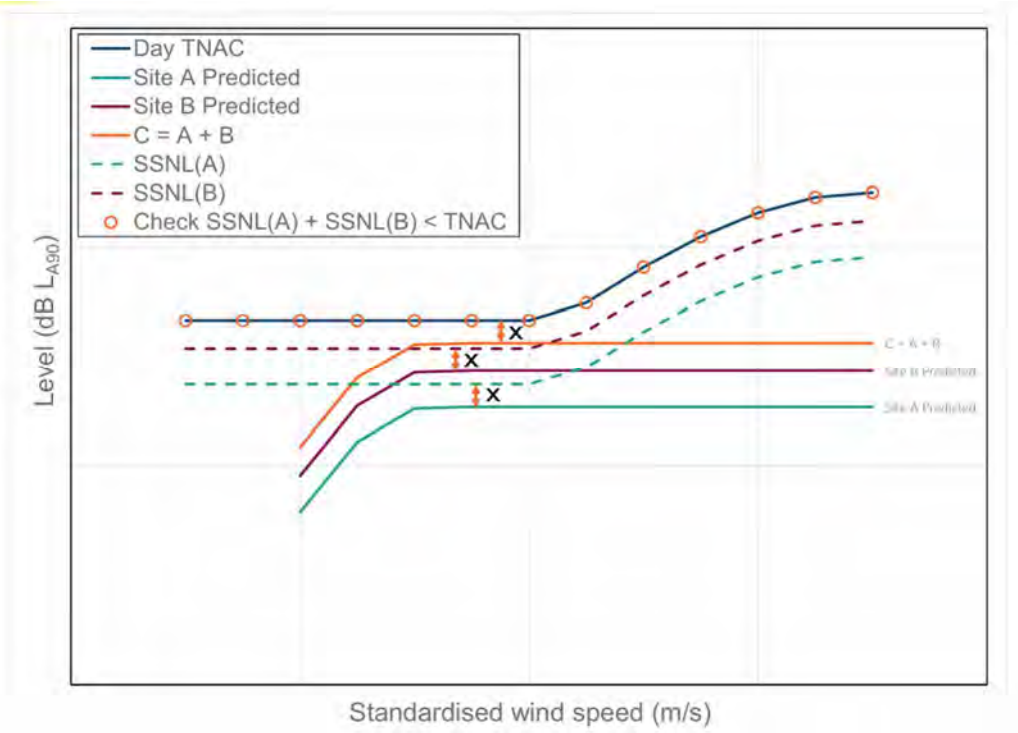
4.5.1 Summary Box 21 of the IOA GPG states:

'Whenever a cumulative situation is encountered, the noise limits for an individual wind farm should be determined in such a way that no cumulative excess of the total ETSU-R-97 noise limit would occur.'

4.5.2 In order to determine Site Specific Noise Limits at receptors in proximity to the Proposed Development (where required), apportionment of the TNAC has been undertaken. The limit apportionment has considered the noise limit already allocated to other wind farms in the area.

4.5.3 This approach is demonstrated in Graph 4.1 below. In this example the TNAC (shown in blue) is shared between wind farm A and wind farm B. The two site specific wind farm noise limits for a given receptor (the solid purple and green lines), when added together, equal the TNAC, and the predicted levels for each wind farm (the dashed lines), meet the Site Specific Limits for the individual wind farms.

Graph 4.1: Limit Apportionment Example



4.5.4 The limit derivation can also be undertaken with consideration to the amount of headroom between another schemes(s) predictions and the TNAC. With regard to this, Section 5.4.11 of the IOA GPG states:

'In cases where there is significant headroom (e.g. 5 to 10 dB) between the predicted noise levels from the existing wind farm and the Total Noise Limits, where there would be no realistic prospect of the existing wind farm producing noise levels up to the Total Noise Limits, agreement could be sought with the LPA as to a suitable predicted noise level (including an appropriate margin to cover factors such as potential increases in noise) from the existing wind farm to be used to inform the available headroom for the cumulative assessment without the need for negotiation or cumulative conditioning. This may be the case particularly at low wind speeds.'

4.5.5 With this in mind, and where appropriate, an additional 2 dB buffer has been added to the other schemes' turbine noise predictions. This is considered to be a suitable buffer in accordance with Section 5.4.11 of the IOA GPG and would represent a 60 % increase in emitted noise levels from the other schemes.

4.5.6 Where predicted wind turbine noise levels from the individual wind farm/turbine schemes are found to be >10 dB below the TNAC then the maximum noise limit available for use by the Proposed Development is equal to the TNAC.

4.5.7 The apportionment calculation described above determines the proportion of the TNAC that is available for future wind farms taking account of operational and consented wind farms in the area (hereafter referred to as the 'residual noise budget').

4.5.8 The residual noise budget effectively represents the maximum SSNL that it would be appropriate to allocate to the Proposed Development but ARWTN details that it may not be appropriate to allocate all of the residual noise budget to a proposed wind farm, instead it may be appropriate to only allocate a proportion of the residual noise budget to retain headroom for developments which may be proposed in the future.

4.5.9 To assist with the calculation of suitable SSNLs which ensure that the TNAC is achieved whilst maintaining headroom for future developments and not resulting in 'unreasonable restriction' (as described in para 2.45 of ARWTN) to a proposed development para 2.47 of the ARWTN guidance provides a series of points that should be considered:

- *'The SSNL should not be higher than the TNAC that would apply to the proposed development in the absence of other wind turbine developments.*
- *The SSNLs should normally follow a profile (variation with wind speeds) closer to the TNAC, rather than the profile of predicted noise levels (see illustration in Figure 3);*
- *The SSNL may be calculated using the 'remaining noise budget' principle, but the applied SSNLs should normally follow a profile closer to the TNAC;*
- *The SSNLs should not normally be set substantially higher than predicted noise levels for the wind farm under consideration at wind speeds where the wind turbines reach their maximum noise levels;*
- *SSNLs shall not be set lower than 10 dB below the TNAC;*
- *SSNLs that apply to noise sources outside of the control of the operator/owner of the development (i.e. cumulative limits) should not be used;*
- *The difference between the SSNL and the TNAC may vary at different noise sensitive receptor locations to account for the relative contribution of other cumulative sites considered, ensuring that cumulative levels remain below the TNAC;*

- *In some cases, it may be appropriate to define a single value SSNL that applies at all wind speeds within a defined range (for example where the lowest applicable LLV is met at all wind speeds).'*

4.5.10 The guidance is not prescriptive, and an element of judgement is required to determine suitable SSNLs. The following steps are taken for each NAL:

1) Restrict the residual noise budget so that it does not exceed the limit that is applicable to the Proposed Development in isolation (the maximum of an LLV of 35 during daytime periods at receptors which are not financially involved);
2) An appropriate buffer is selected in order to leave space for future wind farm development in the area without unduly restricting the Proposed Development. A buffer of 3 dB is deemed appropriate considering the use of a candidate turbine and the potential need to consider character corrections during compliance monitoring;
3) The minimum margin (over the wind speed range considered in the assessment) between the predicted noise levels due to the Proposed Development and the residual noise budget is determined;
4) Where the minimum margin is greater than the buffer, the difference between the minimum margin and the buffer is subtracted from the residual noise budget at each wind speed to determine the SSNL e.g. if the buffer is 3 dB and the minimum margin is 4 dB then 1 dB is subtracted from the residual noise budget to determine the SSNL. The resulting SSNL will follow the profile of the residual noise budget and the minimum margin between the predicted noise levels from the Proposed Development and the SSNL will be equal to the buffer. Where the residual noise budget does not follow the profile of the TNAC, adjustments are made to the SSNL to follow the profile of the TNAC more closely e.g. if the residual noise budget is greater at low wind speeds then the SSNL at low wind speeds is set to the minimum SSNL across the assessed wind speed range;
5) Where the minimum margin at any wind speed is less than the buffer but the margin at other wind speeds is greater than the buffer then the minimum margin at wind speeds other than those where the margin is less than the buffer is determined. The difference between this margin and the buffer is subtracted from the residual noise budget to determine the SSNL at wind speeds where the margin is greater than the buffer; and
6) An exception is made if either of steps 4 or 5 result in an SSNL of less than the TNAC - 10 dB in which case the SSNL is set at the TNAC - 10 dB in line with the ARWTN guidance.

4.5.11 Detailed information on the approach to apportionment per NAL is provided in Section 6.5.6 below.

5 Baseline

5.1.1 As detailed within the EHO Consultation Letter in Annex 2, and as agreed by Stirling Council EHO, it was not possible to undertake a baseline survey to establish background sound levels at NSRs proximate to the Proposed Development. The reason for this was two-fold; firstly there are a number of operational wind farms in the vicinity of the Proposed Development making obtaining background sound measurements which were not contaminated by operational turbine noise difficult; and secondly, the historic background sound levels for nearby receptors, which have been most recently presented within the noise assessment for Earlsburn Wind Farm Extension (ref: ECU00004510), whilst representative, are referenced to a point located upon the Earlsburn site (noting that the Proposed Development is located upon Cairnoch Hill, to the south of the Earlsburn site). It is therefore not appropriate to derive TNACs as a function of these background sound levels due to the difference in wind speed reference. It is noted that this approach (the use of limits which do not vary with wind speed) was also agreed for the nearby proposed Drummarnock Wind Farm (ref: 24/00494/FUL).

5.1.2 Whilst the background sound levels presented for Earlsburn Extension have not been deemed appropriate to derive the TNAC for the Proposed Development; they still provide representative background sound levels at Earlsburn Cottage and Cairnoch Lodge. On this basis, an excerpt from the Earlsburn Extension Noise Assessment which details the background sound environment at these receptors has been included in Annex 3 of this report for context.

6 Noise Assessment Results

6.1 Noise Assessment Locations

6.1.1 NALs refer to the position on the curtilage denoted by the blue house symbol on Figures 13.2.1 and 13.2.2. A total of eleven noise sensitive receptors (all found to be residential dwellings) were chosen as representative NALs. The operational wind farm NALs were defined at an early stage of the project before the wind turbine layout was fixed. The NALs were selected considering initial noise level predictions based on early feasibility studies, the scoping layout, and the potential for that layout to evolve i.e. considering the potential for wind turbines to be located elsewhere within the Site. As such, there are now more NALs than are strictly required for the assessment, however, the NALs have remained the same throughout the evolution of the layout design to maintain consistency throughout the project timeline and are useful to demonstrate the operational noise impacts for all dwellings in the local area i.e. not just those that are the closest. Predictions of wind turbine noise have been made at each of the NALs as detailed in Table 6.1.

6.1.2 This approach ensures that the assessment considers the worst case (highest) noise immission level expected at each group of NSRs (noting that, for clusters of NSRs, only the closest has been selected), as, generally speaking, sound levels decrease with distance (due to the attenuating factors described in Section 6.3) and thus the closer to a noise source, the higher the noise level.

Table 6.1 Noise Assessment Locations

Noise Assessment Location (NAL)	Easting (m)	Northing (m)	Elevation (m AOD)	Distance to Nearest Cairnoch Hill Turbine* (m)
NAL1 - Glendales Farmhouse	272463	684356	243	2035 (T4)
NAL2 - Reservoir Keepers House	271612	684005	230	1649 (T4)
NAL3 - Cairnoch Farm**	269302	684500	242	1395 (T3)
NAL4 - Cairnoch Bothy**	269275	684519	242	1399 (T3)
NAL5 - Gartcarron Fintry	267041	685938	212	2187 (T1)
NAL6 - Todholes	267304	686079	214	1903 (T1)
NAL7 - Cairnoch Lodge**	270317	686773	311	1145 (T2)
NAL8 - Easter Cringate**	270468	686868	314	1319 (T2)
NAL9 - Easter Cringate Cottage***	271742	687532	319	2384 (T4)
NAL10 - Earlsburn Cottage	270632	688296	360	2402 (T1)

Noise Assessment Location (NAL)	Easting (m)	Northing (m)	Elevation (m AOD)	Distance to Nearest Cairnoch Hill Turbine* (m)
NAL11 - Ryecroft	272485	688106	338	3251 (T4)

** Please note the approximate distances to nearest turbines quoted above may differ from those reported elsewhere. Distances for the noise assessment are taken from the nearest turbine to the closest edge of the amenity area (usually the garden), not the dwelling.*
*** The occupiers are financially involved with the Proposed Development.*
**** The occupiers are financially involved with Craigengelt Wind Farm.*

6.2 Noise Emission Characteristics of the Wind Turbines

6.2.1 There are a range of wind turbine models that may be suitable for installation at the Proposed Development. This assessment considers the Vestas V162 7.2 MW with serrated trailing edge blades and a hub height of 99 m.

6.2.2 A detailed list of all of the wind turbine developments considered in the noise predictions are included in Annex 4. Details of the sound power level, octave data and measurement uncertainty used for the turbines considered in this assessment are included in Annex 5.

6.2.3 The data for the Proposed Development candidate turbine has not been included due to data confidentiality, however, the detailed noise data could be made available upon request, subject to the signing of the appropriate Non-Disclosure Agreement.

6.2.4 Due to the differences in the way in which levels are provided by the different manufacturers, TNEI has accounted for uncertainty using the guidance contained within Section 4.2 of the IOA GPG.

6.2.5 Manufacturer data is usually supplied based on a specific hub height, whilst values are presented as standardised to 10 m height. The noise model used in this assessment alters turbine noise data to account for different hub heights, where applicable. The hub heights considered for the other turbine development is summarised in Annex 4.

6.2.6 The location of the Proposed Development and cumulative wind turbines are shown on Figure 13.2.2 in Annex 1 and grid references are included in Annex 4.

6.3 Noise Propagation Parameters

6.3.1 All noise level predictions have been undertaken using a receiver height of 4.0 m above local ground level, mixed ground (G=0.5) and air absorption co-efficient based on a temperature of 10 °C and 70 % relative humidity. The modelling parameters reflect current good practice as detailed within the IOA GPG.

6.3.2 The wind turbine noise immission levels are based on the $L_{A90,10\ minute}$ noise indicator in accordance with the recommendations in ARWTN, which were obtained by subtracting 2 dBA from the calculated $L_{Aeq,10\ minute}$ levels.

6.3.3 A topographical assessment has been undertaken between each NAL and wind turbine location to determine whether any concave ground profiles exist between the source and receiver. Analysis undertaken using a combination of CadnaA (27) and an Excel model found that if the formula in the IOA GPG is applied directly, a +3 dB correction is required for some turbines at a number of receptors. These corrections are detailed in Annex 4.

6.3.4 In addition, an assessment has been undertaken to determine whether any topographical screening effects of the terrain occur where there is no direct line of sight between the highest point on the turbine rotor and the receiver location. Upon analysis of each NAL it was found that a barrier correction of -2 dB could be applied for some turbine/receptor combinations. This is also detailed in Annex 4.

6.3.5 In reality, there is significant screening at some of the locations, so more attenuation may occur in practice, and the use of a 2 dB value is considered to be conservative.

6.3.6 The need to include the above concave ground or screening corrections may change, depending on the final location of the turbines (following micrositing) and the final turbine hub height. Nevertheless, turbine noise levels would have to meet the noise limits detailed in planning conditions regardless of any difference in noise propagation caused by topography and the need to apply a concave slope correction would need to be considered again by the Applicant, prior to the final selection of a turbine model for the Proposed Development.

6.3.7 The cumulative assessment has taken into account directivity effects in line with good practice. The directivity of wind turbines has been recognised for some time. Building on earlier work by NASA, in 1988 Wyle Laboratories studied sound propagation using an omnidirectional loudspeaker source elevated 80 ft above ground, in upwind, downwind and cross wind situations, and in both flat and hilly terrain, then compared those measurements to measured data from actual wind turbines. Their study quantified directivity factors for a limited frequency range but was unable to conclusively demonstrate the anticipated directivity effects of real wind turbines. It also highlighted, but was unable to explain, measured differences observed between flat and hilly terrain.

6.3.8 Hubbard (1990) (IOA GPG Section 4.4.3) described a number of factors believed to influence propagation and directivity, notably refraction caused by vertical wind and temperature gradients. In the downwind direction the wind gradient causes the sound rays to bend toward the ground, whereas in the upwind direction the rays curve upward away from the ground. Upwind of the turbine, this results in a region of increased attenuation termed the 'shadow zone'. This increased level of attenuation is frequency dependent, with the lowest frequencies experiencing the least amount of attenuation. Relating this to the earlier NASA studies, Hubbard noted that the distance from the source to the edge of the shadow zone is related to the wind speed gradient and the elevation of the source, which for a typical turbine source was calculated to be approximately 5 times the source height.

6.3.9 This observation was adopted in the IOA GPG, which states (Section 4.4.2) '*Such reductions (due to "shadow zone" refraction effects) will in practice only progressively come into play at distances of between 5 and 10 turbine tip heights*'. Section 4.4.3 of the IOA GPG provides graphical examples of increasing broadband directivity with increasing tip height scaling, for both flat and hilly terrain, without qualifying either of those designations.

6.3.10 The IOA GPG recommends (Section 4.4.1) that directivity attenuation factors adopted in any assessment should be clearly stated. The TNEI noise model can consider the effect of directivity, and in line with current good practice the attenuation values used are detailed in Table 6.2. These are based upon the examples given in the IOA GPG (Section 4.4.2), using interpolation where required, to adopt a single attenuation value for receptors located more than 5 tip heights from a turbine.

Table 6.2 Wind Directivity Attenuation Factors used in Modelling

Direction (º)	0	15	30	45	60	75	90	105	120	135	150	165
Attenuation, dBA	-10	-9.9	-9.3	-8.3	-6.7	-4.6	-2	0	0	0	0	0
Direction (º)	**180**	**195**	**210**	**225**	**240**	**255**	**270**	**285**	**300**	**315**	**330**	**345**
Attenuation, dBA	0	0	0	0	0	0	-2	-4.6	-6.7	-8.3	-9.3	-9.9

6.4 Total Noise Assessment Criteria (Stage 1)

6.4.1 ARWTN states in Section 2.24) that:

'When determining a cumulative TNAC for several wind farms or the extension of an existing project (see cumulative noise section 2.39 to 2.43), the total generating capacity from the relevant sites included in the assessment should be considered.' and 'The effect of the choice of LLV on energy generation should also represent a consideration. If the choice of LLV does not impact on energy generation of the wind development, for example because the nearest noise-sensitive receptors are relatively distant, then a lower LLV should be applied.'

6.4.2 The derivation strategy for the daytime LLV used to determine the TNAC for the cumulative assessment is summarised in Table 6.3 below. Based on consideration of the three factors specified by ARWTN, a daytime LLV of 40 dB is deemed appropriate for use in the cumulative scenario.

Table 6.3 TNAC Derivation Strategy

Factor	Guidance in ARWTN	Commentary for the Proposed Development
1)	*'The generating capacity of the wind farm and the likely consequence that the choice of LLV would have on the energy generation of the wind farm(s).'*	The generating capacity of the sites considered in the cumulative assessment is 474 MW which is large in the national context and would allow a significant amount of renewable energy to be generated. If the TNAC was derived based on a lower LLV of 35 dB this would result in the derivation of lower Site Specific Noise Limits and exceedances of the noise limits would occur. This would require noise management and reduce the amount of

Factor	Guidance in ARWTN	Commentary for the Proposed Development
		energy generated by the Proposed Development. Consideration of this test suggests that an LLV towards the upper end of the allowed range would be appropriate.
2)	*'The number of dwellings in the neighbourhood of the wind farm(s) and the magnitude of the levels to which these are exposed.'*	The Site is located in a rural area with a relatively low number of scattered dwellings. Of the 11 NALs considered, only 8 need to be considered in the cumulative assessment as predicted noise levels from the Proposed Development are 10 dB below those from the other sites considered in the cumulative assessment, such that noise from the Proposed Development has a negligible contribution to the cumulative noise level, at 3 of the NALs. Of the 8 NALs considered, 7 are predicted to experience cumulative noise levels of greater than or equal to 35 dB although four of these (NALs 3, 4, 7 & 8) are financially involved with the Proposed Development. Whilst some of these NALs represent multiple NSRs, this number is considered to be low given the size of the cumulative development. Two of the 8 NALs considered in the cumulative assessment are predicted to experience cumulative wind farm noise levels of greater than 40 dB although both of these are financially involved with the Proposed Development. The maximum predicted cumulative noise level at the 8 NALs considered is 40.8 dB (37.5 dB at NALs without financial involvement). Consideration of this test suggests that an LLV towards the upper end of the range permitted in ARWTN would be appropriate.
3)	*'The duration and level of exposure to wind turbine noise of dwellings in the neighbourhood of the wind farm(s).'*	The level of exposure is low (<35 dB) for one of the 8 NALs when considering the cumulative predicted noise levels. At the 7 NALs where cumulative noise levels of >= 35 dB are predicted it should be noted that this is only the case when the standardised 10 m wind speed is high enough. Cumulative noise levels of >= 35 dB are not predicted to occur for wind speeds of less than 7 m/s at two NALs (3 & 4). Background sound levels were not measured but are expected to be relatively low which is consistent with rural locations in the UK. As such, there are times when the predicted cumulative noise levels are likely to exceed the

Factor	Guidance in ARWTN	Commentary for the Proposed Development
		background sound levels, particularly at standardised 10 m wind speeds in the middle of the range considered. At lower wind speeds, the wind farm noise levels are low and the background sound levels continue to increase at higher wind speeds whilst the wind farm noise levels level off once they have reached their maximum. Of the 7 NALs with predicted cumulative noise levels of greater than 35 dB, four (NALs 3-6) are located such that they are not predicted to experience noise levels of greater than 35 dB when the wind is from predominant wind directions (taken to be direction sectors of between 210 and 270 degrees). Three NALs (1, 7 & 8) are located such that the noise levels experienced in the predominant wind directions, whilst >= 35 dB, would be less than those used in the assessment i.e. the worst case wind direction sector is a non-predominant sector. Of the 7 NALs with predicted cumulative noise levels of greater than 35 dB, the average difference in the predicted noise level between the wind direction with the greatest noise level and the wind direction with the lowest noise level is 6.0 dB. At 5 of these NALs noise levels of below 35 dB would be experienced in five or more wind direction sectors. Two of these NALs (7 & 8) are located such that noise levels of greater than or equal to 35 dB are predicted to be experienced in all direction sectors should the wind speed be high enough although both of these are financially involved with the Proposed Development. Consideration of this test suggests that an LLV towards the upper end of the range specified by ARWTN may be appropriate.

6.4.3 The TNAC have been established for each of the NALs as detailed in Table 6.4 and Table 6.5 below, based on a LLV of 40 dBA (daytime) or 43 dBA (Night-time). A 45 dBA LLV is applicable at NALs with financial involvement with either the Proposed Development or a neighbouring scheme.

Table 6.4 TNAC Daytime

Location	Wind Speed (ms^{-1}) as standardised to 10m height									
	1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
NAL2 - Reservoir Keepers House	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
NAL3 - Cairnoch Farm*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL4 - Cairnoch Bothy*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL5 - Gartcarron Fintry	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
NAL6 - Todholes	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
NAL7 - Cairnoch Lodge*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL8 - Easter Cringate*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL9 - Easter Cringate Cottage**	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL10 - Earlsburn Cottage	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
NAL11 - Ryecroft	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0

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Table 6.5 TNAC Night-time

Location	Wind Speed (ms^{-1}) as standardised to 10m height									
	1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NAL2 - Reservoir Keepers House	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NAL3 - Cairnoch Farm*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL4 - Cairnoch Bothy*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL5 - Gartcarron Fintry	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NAL6 - Todholes	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NAL7 - Cairnoch Lodge*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL8 - Easter Cringate*	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL9 - Easter Cringate Cottage**	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
NAL10 - Earlsburn Cottage	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
NAL11 - Ryecroft	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0

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6.5 Predicting the Requirement for a Cumulative Assessment and the Likely Effects (Stage 2)

6.5.1 A comparison has been undertaken of the predicted noise immission levels from the Proposed Development alongside all other schemes to determine whether predictions are within 10 dB of each other. All turbines have been assumed to be operating in unconstrained operating modes. Table 6.6 summarises the results and details whether a cumulative noise assessment is required. As is detailed in Section 4.4 above, if the predictions are greater than 10 dB apart then a cumulative noise assessment is not required. Where predictions are found to be within 10 dB of each other a cumulative assessment is required.

Table 6.6 Cumulative Assessment Requirement

Noise Assessment Location (NAL)	Are predicted wind turbine noise levels within 10 dB?	Is a cumulative assessment required?
NAL1 - Glendales Farmhouse	YES	YES
NAL2 - Reservoir Keepers House	YES	YES
NAL3 - Cairnoch Farm	YES	YES
NAL4 - Cairnoch Bothy	YES	YES

Noise Assessment Location (NAL)	Are predicted wind turbine noise levels within 10 dB?	Is a cumulative assessment required?
NAL5 - Gartcarron Fintry	YES	YES
NAL6 - Todholes	YES	YES
NAL7 - Cairnoch Lodge	YES	YES
NAL8 - Easter Cringate	YES	YES
NAL9 - Easter Cringate Cottage	NO	NO
NAL10 - Earlsburn Cottage	NO	NO
NAL11 - Ryecroft	NO	NO

6.5.2 A cumulative noise assessment is required at NALs 1-8. A summary of the noise prediction comparisons are included in Annex 4 (noting that all predictions are based on full mode operation of each developments' respective turbines).

6.5.3 The results of the cumulative noise assessment are summarised in Table 6.7 and Table 6.8, which show that the predicted cumulative wind turbine noise immission levels meet the TNAC under all conditions at all NALs.

6.5.4 The predicted 'likely' cumulative levels are the actual levels expected at an NAL and include the addition of an appropriate level of uncertainty to the turbine data as per Section 4.2 of the IOA GPG. The uncertainty level added is generally +2 dB but this can vary depending on the turbine manufacturer data available for each turbine.

6.5.5 Figures 13.2.3a-h show predictions from the Proposed Development and 'cumulative (including Proposed Development)' against the TNAC. The individual contribution of the cumulative schemes are also shown.

Table 6.7 TNAC Compliance Table – Likely Cumulative Noise - Daytime

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	TNAC L_{A90}	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.7	36.9	37.3	37.3	37.4
	Exceedance Level	-	-	-	-	-	-4.3	-3.1	-2.7	-2.7	-2.6
NAL2 - Reservoir Keepers House	TNAC L_{A90}	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	32.9	34.4	34.7	34.8	34.8
	Exceedance Level	-	-	-	-	-	-7.1	-5.6	-5.3	-5.2	-5.2
NAL3 – Cairnoch Farm	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	34.3	36.0	36.2	36.2	36.2
	Exceedance Level	-	-	-	-	-	-10.7	-9.0	-8.8	-8.8	-8.8
NAL4 - Cairnoch Bothy	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	34.4	36.1	36.2	36.3	36.3
	Exceedance Level	-	-	-	-	-	-10.6	-8.9	-8.8	-8.7	-8.7
NAL5 - Gartcarron Fintry	TNAC L_{A90}	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.2	36.3	36.5	36.7	36.8
	Exceedance Level	-	-	-	-	-	-4.8	-3.7	-3.5	-3.3	-3.2
NAL6 - Todholes	TNAC L_{A90}	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.9	36.9	37.2	37.3	37.4
	Exceedance Level	-	-	-	-	-	-4.1	-3.1	-2.8	-2.7	-2.6

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL7 - Cairnoch Lodge	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	39.1	40.3	40.7	40.8	40.9
	Exceedance Level	-	-	-	-	-	-5.9	-4.7	-4.3	-4.2	-4.1
NAL8 - Easter Cringate	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	39.1	40.2	40.6	40.7	40.8
	Exceedance Level	-	-	-	-	-	-5.9	-4.8	-4.4	-4.3	-4.2

Note: For the cumulative noise predictions the noise model considers the range of noise data available for each turbine type modelled. For some turbines noise data was not available for wind speeds less than 6 ms^{-1} therefore no cumulative predictions are included for wind speeds less than 6 ms^{-1}.

Table 6.8 TNAC Compliance Table – Likely Cumulative Noise – Night-time

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	TNAC L_{A90}	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.7	36.9	37.3	37.3	37.4
	Exceedance Level	-	-	-	-	-	-7.3	-6.1	-5.7	-5.7	-5.6
NAL2 - Reservoir Keepers House	TNAC L_{A90}	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	32.9	34.4	34.7	34.8	34.8
	Exceedance Level	-	-	-	-	-	-10.1	-8.6	-8.3	-8.2	-8.2
NAL3 – Cairnoch Farm	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	34.3	36	36.2	36.2	36.2
	Exceedance Level	-	-	-	-	-	-10.7	-9	-8.8	-8.8	-8.8
NAL4 - Cairnoch Bothy	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	34.4	36.1	36.2	36.3	36.3
	Exceedance Level	-	-	-	-	-	-10.6	-8.9	-8.8	-8.7	-8.7
NAL5 - Gartcarron Fintry	TNAC L_{A90}	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.2	36.3	36.5	36.7	36.8
	Exceedance Level	-	-	-	-	-	-7.8	-6.7	-6.5	-6.3	-6.2
NAL6 - Todholes	TNAC L_{A90}	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	35.9	36.9	37.2	37.3	37.4
	Exceedance Level	-	-	-	-	-	-7.1	-6.1	-5.8	-5.7	-5.6

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL7 - Cairnoch Lodge	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	39.1	40.3	40.7	40.8	40.9
	Exceedance Level	-	-	-	-	-	-5.9	-4.7	-4.3	-4.2	-4.1
NAL8 - Easter Cringate	TNAC L_{A90}	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	Predicted Wind Turbine Noise L_{A90}	-	-	-	-	-	39.1	40.2	40.6	40.7	40.8
	Exceedance Level	-	-	-	-	-	-5.9	-4.8	-4.4	-4.3	-4.2

Note: For the cumulative noise predictions the noise model considers the range of noise data available for each turbine type modelled. For some turbines noise data was not available for wind speeds less than 6 ms^{-1} therefore no cumulative predictions are included for wind speeds less than 6 ms^{-1}.

6.5.6 Where the occupiers of an NAL are considered as financially involved with the Proposed Development or another wind farm then two tests need to be undertaken as outlined below.

'For the purposes of cumulative noise assessment, financial involvement (see paragraph 2.29) is specific to the wind farm in which the receptor has an interest.

Accordingly, there are two tests that should be undertaken at each financially involved noise-sensitive receptor:

- *Total cumulative noise from all relevant developments including the one which it is financially involved with must not exceed the financially involved TNAC.*
- *Total cumulative noise from all relevant developments excluding the one which it is financially involved with must not exceed the non-financially involved TNAC.'*

6.5.7 The first test is considered as part of the cumulative modelling outlined above. For the second test, a set of additional Figures have been produced and these are included in Annex 1 as Figures 13.2.5a-e. Predicted cumulative noise levels from all relevant developments excluding the one which it is financially involved with do not exceed the non-financially involved TNAC except at NAL8 where a minor exceedance is predicted during the daytime. The minor exceedance is due to existing developments and may not occur in reality as it has been assumed that all turbines are operating in an unconstrained mode within this modelling in order to provide a worst-case scenario. However, the need for the employment of mode management is detailed within the noise assessments for both Drummarnock and Earlsburn Extension.

6.6 Derivation of Site Specific Noise Limits (Stage 3)

6.6.1 To protect residential amenity, the IOA GPG recommendations are that cumulatively, all schemes operate within the TNAC. This can be found in summary box SB21 of the IOA GPG (2013) which states:

'Whenever a cumulative situation is encountered, the noise limits for an individual wind farm should be determined in such a way that no cumulative excess of the total ETSU-R-97 noise limit would occur.'

6.6.2 As detailed in Section 4.3.2 above, the daytime Site Specific Noise Limits (SSNLs) have been derived based on guidance contained within ARWTN. This assumes that all in planning turbines are built.

6.6.3 Table 6.9 summarises the approach adopted at each NAL to derive the Site Specific Noise Limits.

Table 6.9 Limit Derivation Strategy

NAL	Limit Derivation Strategy
NAL1	The likely predicted levels from other schemes were found to be within 5 dB of the TNAC during the daytime period. As such, the daytime residual noise budget was derived to be 10 dB below the TNAC.

NAL	Limit Derivation Strategy
	During the night-time, the predicted cumulative noise (excluding the Proposed Development) was >5 dB below the TNAC meaning significant headroom was available. In accordance with Section 4.5 above, a 2 dB buffer was therefore added to the turbine noise predictions for each of the other developments; this is considered to be a suitable buffer in accordance with Section 5.4.11 of the IOA GPG and would represent a 60 % increase in emitted noise levels from the other schemes. The resulting maximum 'cautious' prediction of cumulative wind turbine noise has been logarithmically subtracted from the TNAC to determine the residual noise budget. The Site Specific Noise Limits are then determined as follows: During the daytime, significant headroom is not available so the SSNL is set equal to the residual noise budget, 10 dB below the TNAC. During the night-time the margin between the predicted noise levels due to the Proposed Development and the residual noise budget is greater than 3 dB, however as reducing the limit to achieve a margin of 3 dB would result in an SSNL of less than the TNAC minus 10 dB, the night-time SSNL has been set at 10 dB below the TNAC.
NAL2	The likely predicted levels from other schemes were found to be within 10 dB of the TNAC. As such, the limit has been apportioned based on a cautious prediction of cumulative turbine noise. The noise predictions for the other cumulative schemes show that there is, in theory, significant headroom between the likely predicted levels and the TNAC (>5 dB). Therefore the 'cautious' predictions of cumulative wind turbine noise have then been logarithmically subtracted from the TNAC to determine the residual noise budget. The Site Specific Noise Limits are then determined as follows: During the night, as the minimum margin between the predicted noise levels due to the Proposed Development and the residual noise budget is greater than the buffer (3 dB), the difference between the minimum margin and the buffer is subtracted from the residual noise budget to determine the SSNL. During the daytime the residual noise budget is restricted to the LLV for the Proposed Development in isolation (35 dB) i.e. the lower of the two is determined. As the margin between the predicted noise levels due to the Proposed Development and the restricted residual noise budget is greater than 3 dB, the difference between the minimum margin and the buffer is subtracted from the residual noise budget to determine the SSNL.
NAL3*, NAL4*	The likely predicted levels from the other schemes were found to be equal to, or greater than, 10 dB below the TNAC at all windspeeds. As such, the whole available residual noise budget (subject to the LLV) has been allocated to the Proposed Development.

NAL	Limit Derivation Strategy
	The Site Specific Noise Limits are then determined as follows: For daytime and night-time periods the minimum margin between the predicted noise levels due to the Proposed Development and the residual noise budget is greater than the buffer (3 dB), and as such the difference between the minimum margin and the buffer is subtracted from the residual noise budget to determine the SSNL. *NAL3 and NAL4 are Financially Involved with the Proposed Development, affording a higher fixed minimum limit of 45 dB during the daytime and night-time when deriving both the TNAC and SSNLs.
NAL5, NAL6	At these NALs, the 3rd party acoustically significant schemes (turbine noise predictions which are greater than 25 dB) are Shelloch and Earlsburn (Original, North, and Extension combined) Wind Farms. Section 37 of the Shelloch Wind Farm Decision Notice (20/00840/FUL) details the maximum warranted sound power level of it's turbines must be limited to 109 dB. Therefore the sound power levels for the modelled Shelloch Wind Farm turbines have been uplifted to match this criteria (2.1 dB for the Vestas V150, and 3.1 dB for the Vestas V136). It should be noted that these uplifts have been applied for all NALs. Section 38 of the Shelloch Wind Farm Decision Notice details that wind turbine noise from the development must not exceed 35 dB, or the background sound level plus 5 dB, whichever is the greater, for wind speeds standardised to a reference height of 10 m up to a wind speed of 10 m/s. Section 29 of the Earlsburn Extension Decision Notice (ECU00004510) provides noise limits for the combined operation of Earlsburn Original, North, and Extension Wind Farms. Table 12.10 of Earlsburn Wind Farm Extension: Volume 2: Main FEI Report details that the full mode predictions of Earlsburn Wind Farms (Combined) equals the conditioned noise limit at 8 m/s during the daytime at Earlsburn Cottage. Noting that at these NALs, the maximum predicted noise levels from Shelloch Wind Farm are below 35 dB (even with a maximum turbine sound power level of 109 dB), and Earlsburn Cottage is in effect acting as a controlling property for wind turbine noise from Earlsburn Combined at NAL4 and NAL5 (as full mode predictions of Earlsburn Combined cannot become louder than predicted without exceeding their conditioned noise limit at this receptor), it was deemed appropriate to logarithmically subtract the maximum predicted noise level from the combined cumulative operation of all the 3rd party schemes (plus a 2 dB buffer, as detailed within the EHO Consultation Letter in Annex 2) from the TNAC in order to derive the residual noise budget. The 2 dB buffer added to the maximum predicted noise level from Earlsburn (Combined) Wind Farms has been included on a precautionary basis as it is noted that the downwind conditions from Earlsburn Combined Wind Farms to Earlsburn Cottage, and to NAL4 and NAL5, are different (approximately 205° in comparison to approximately 125°, respectively). Therefore, an allowance has been made should the installed turbine for Earlsburn Extension be louder than the modelled candidate turbine, or the existing turbine noise from Earlsburn Original and North are louder than predicted, and therefore the employment of mode management curtailment

NAL	Limit Derivation Strategy
	for certain downwind conditions to Earlsburn Cottage is used which would not be applicable to the downwind conditions for NAL4 and NAL5. The Site Specific Noise Limits are then determined as follows: During the daytime the residual noise budget is restricted to the LLV for the Proposed Development in isolation (35 dB) i.e. the lower of the two is determined. As the margin between the predicted noise levels due to the Proposed Development and the restricted residual noise budget is greater than 3 dB, the difference between the minimum margin and the buffer is subtracted from the residual noise budget to determine the SSNL. During the night the margin between the predicted noise levels due to the Proposed Development and the residual noise budget is greater than 3 dB, however as reducing the limit to achieve a margin of 3 dB would result in an SSNL of less than the TNAC minus 10 dB, the night-time SSNL has been set at 10 dB below the TNAC.
NAL7*, NAL8*	At these NALs, the 3rd party acoustically significant schemes (turbine noise predictions which are greater than 25 dB) are Earlsburn (Original, North, and Extension combined), Craigengelt (06/01052/DET), Craigannet Farm (15/00211/FUL), and Easter Cringate (10/00660/FUL). Given that the predicted combined full mode cumulative operation of all the 3rd party schemes, excluding the Proposed Development, are already marginally in excess of the Non-Financially Involved daytime TNAC at these receptors (as set by the noise limits detailed within the Earlsburn Extension Decision Notice and Annex 3). It was deemed appropriate to logarithmically subtract the maximum predicted noise level from the combined cumulative operation of all the 3rd party schemes (plus a cautious 2 dB buffer) from the TNAC to derive the residual noise budget for the Proposed Development at these NALs. The addition of the 2 dB buffer provides an allowance should existing wind turbine noise be greater than what is predicted, noting that Craigengelt Wind Farm (which is an acoustically significant scheme at these NALs) does not have applicable noise limits as per it's Decision Notice, and Earlsburn Combined could employ directional mode management. The Site Specific Noise Limits are then determined as follows: For daytime and night-time periods, the minimum margin between the predicted noise levels due to the Proposed Development and the residual noise budget is greater than the buffer (3 dB), as such the difference between the minimum margin and the buffer is subtracted from the residual noise budget to determine the SSNL. *NAL6 and NAL7 are Financially Involved with the Proposed Development, affording a higher fixed minimum limit of 45 dB during the daytime and night-time when deriving both the TNAC and SSNL.
NAL9, NAL10, NAL11	The likely predicted levels from other schemes were found to be within 5 dB of the TNAC during the daytime and night-time period. As such, the daytime and night-time residual noise budget was derived to be 10 dB below the TNAC. The daytime and night-time SSNL was subsequently set equal to the residual noise budget, 10 dB below the TNAC.

6.6.4 Table 6.10 and Table 6.11 show the daytime and night-time Site Specific Noise Limits, noise predictions for the Proposed Development and the exceedance level. A negative exceedance demonstrates compliance with the Site Specific Noise Limits.

6.6.5 The tables show that the predicted wind turbine noise immission levels meet the Site Specific Noise Limits under all conditions and at all locations for both daytime and night-time periods.

6.6.6 A series of graphs to show the predicted wind turbine noise from the Proposed Development compared to the Site Specific Noise Limits are included as Figures 13.2.4a-k. Two graphs are provided for each NAL (daytime and night-time), which show the TNAC (solid red line), residual noise budget (dashed orange line with circles), the Site Specific Noise Limit (dashed red line with triangles) and the predicted wind turbine noise from the Proposed Development (solid blue line).

Table 6.10 Site Specific Noise Limits Compliance Table – Daytime

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	Site Specific Noise Limit L_{A90}	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
	Predicted Wind Turbine Noise L_{A90}	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Exceedance Level	-	-	-12.3	-10.8	-7.6	-4.1	-2.0	-2.0	-2.0	-2.0
NAL2 - Reservoir Keepers House	Site Specific Noise Limit L_{A90}	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
	Predicted Wind Turbine Noise L_{A90}	-	-	19.9	21.4	24.6	28.1	30.2	30.2	30.2	30.2
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL3 – Cairnoch Farm	Site Specific Noise Limit L_{A90}	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
	Predicted Wind Turbine Noise L_{A90}	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL4 - Cairnoch Bothy	Site Specific Noise Limit L_{A90}	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
	Predicted Wind Turbine Noise L_{A90}	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL5 - Gartcarron Fintry	Site Specific Noise Limit L_{A90}	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4
	Predicted Wind Turbine Noise L_{A90}	-	-	19.1	20.6	23.8	27.3	29.4	29.4	29.4	29.4
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL6 - Todholes	Site Specific Noise Limit L_{A90}	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
	Predicted Wind Turbine Noise L_{A90}	-	-	19.2	20.7	23.9	27.4	29.5	29.5	29.5	29.5
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL7 - Cairnoch Lodge	Site Specific Noise Limit L_{A90}	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
	Predicted Wind Turbine Noise L_{A90}	-	-	26.6	28.1	31.3	34.8	36.9	36.9	36.9	36.9
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL8 - Easter Cringate	Site Specific Noise Limit L_{A90}	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
	Predicted Wind Turbine Noise L_{A90}	-	-	25.5	27.0	30.2	33.7	35.8	35.8	35.8	35.8
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL9 - Easter Cringate Cottage	Site Specific Noise Limit L_{A90}	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
	Predicted Wind Turbine Noise L_{A90}	-	-	20.0	21.5	24.7	28.2	30.3	30.3	30.3	30.3
	Exceedance Level	-	-	-15.0	-13.5	-10.3	-6.8	-4.7	-4.7	-4.7	-4.7
NAL10 - Earlsburn Cottage	Site Specific Noise Limit L_{A90}	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
	Predicted Wind Turbine Noise L_{A90}	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Exceedance Level	-	-	-12.3	-10.8	-7.6	-4.1	-2.0	-2.0	-2.0	-2.0
NAL11 - Ryecroft	Site Specific Noise Limit L_{A90}	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
	Predicted Wind Turbine Noise L_{A90}	-	-	16.6	18.1	21.3	24.8	26.9	26.9	26.9	26.9
	Exceedance Level	-	-	-13.4	-11.9	-8.7	-5.2	-3.1	-3.1	-3.1	-3.1

Table 6.11 Site Specific Noise Limits Compliance Table – Night-time

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	Site Specific Noise Limit L_{A90}	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
	Predicted Wind Turbine Noise L_{A90}	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Exceedance Level	-	-	-15.3	-13.8	-10.6	-7.1	-5.0	-5.0	-5.0	-5.0
NAL2 - Reservoir Keepers House	Site Specific Noise Limit L_{A90}	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
	Predicted Wind Turbine Noise L_{A90}	-	-	19.9	21.4	24.6	28.1	30.2	30.2	30.2	30.2
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL3 – Cairnoch Farm	Site Specific Noise Limit L_{A90}	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
	Predicted Wind Turbine Noise L_{A90}	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL4 - Cairnoch Bothy	Site Specific Noise Limit L_{A90}	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3
	Predicted Wind Turbine Noise L_{A90}	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL5 - Gartcarron Fintry	Site Specific Noise Limit L_{A90}	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
	Predicted Wind Turbine Noise L_{A90}	-	-	19.1	20.6	23.8	27.3	29.4	29.4	29.4	29.4
	Exceedance Level	-	-	-13.9	-12.4	-9.2	-5.7	-3.6	-3.6	-3.6	-3.6
NAL6 - Todholes	Site Specific Noise Limit L_{A90}	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
	Predicted Wind Turbine Noise L_{A90}	-	-	19.2	20.7	23.9	27.4	29.5	29.5	29.5	29.5
	Exceedance Level	-	-	-13.8	-12.3	-9.1	-5.6	-3.5	-3.5	-3.5	-3.5

Location		Wind Speed (ms^{-1}) as standardised to 10 m height									
		1	2	3	4	5	6	7	8	9	10
NAL7 - Cairnoch Lodge	Site Specific Noise Limit L_{A90}	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
	Predicted Wind Turbine Noise L_{A90}	-	-	26.6	28.1	31.3	34.8	36.9	36.9	36.9	36.9
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL8 - Easter Cringate	Site Specific Noise Limit L_{A90}	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
	Predicted Wind Turbine Noise L_{A90}	-	-	25.5	27.0	30.2	33.7	35.8	35.8	35.8	35.8
	Exceedance Level	-	-	-13.3	-11.8	-8.6	-5.1	-3.0	-3.0	-3.0	-3.0
NAL9 - Easter Cringate Cottage	Site Specific Noise Limit L_{A90}	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
	Predicted Wind Turbine Noise L_{A90}	-	-	20.0	21.5	24.7	28.2	30.3	30.3	30.3	30.3
	Exceedance Level	-	-	-15.0	-13.5	-10.3	-6.8	-4.7	-4.7	-4.7	-4.7
NAL10 - Earlsburn Cottage	Site Specific Noise Limit L_{A90}	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
	Predicted Wind Turbine Noise L_{A90}	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Exceedance Level	-	-	-15.3	-13.8	-10.6	-7.1	-5.0	-5.0	-5.0	-5.0
NAL11 - Ryecroft	Site Specific Noise Limit L_{A90}	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0
	Predicted Wind Turbine Noise L_{A90}	-	-	16.6	18.1	21.3	24.8	26.9	26.9	26.9	26.9
	Exceedance Level	-	-	-16.4	-14.9	-11.7	-8.2	-6.1	-6.1	-6.1	-6.1

6.6.7 The assessment shows that the predicted wind turbine noise immission levels meet the Site Specific Noise Limits under all conditions and at all locations for both daytime and night-time periods at all receptors.

6.6.8 In the event that consent is granted for the Proposed Development it would be appropriate to set noise limits within the planning conditions that are equal to the Site Specific Noise Limits contained in Table 6.10 and Table 6.11.

6.7 Micrositing

6.7.1 A 50 m micrositing distance is proposed. It should be noted that the need to include a concave ground profile correction and/or barrier correction may change depending on the final location of the turbines (following micrositing) and the final turbine hub height. Nevertheless, turbine noise levels would have to meet the noise limits established in this report regardless of any increases and decreases in noise propagation caused by topography. Should consent be granted, the need to apply a concave ground profile/barrier correction would need to be considered by the Applicant prior to the final selection of a turbine model for the Site.

7 Summary and Conclusions

7.1.1 This report has assessed the potential impact of operational noise from the Proposed Development on the residents of nearby residential receptors. The guidance contained within ARWTN and current good practice (IOA GPG) has been used to assess the potential noise impact of the Proposed Development.

7.1.2 A TNAC of 40 dBA daytime and 43 dBA night-time was used for this assessment with the exception of financially involved properties where a 45 dBA limit was applied.

7.1.3 A cumulative assessment was undertaken at NALs 1-8. The results show that the predicted cumulative wind farm noise immission levels would meet the TNAC at all NALs during both the daytime and night-time periods.

7.1.4 Site Specific Noise Limits have been derived in accordance with ARWTN.

7.1.5 The wind turbine noise immission levels from the Proposed Development were predicted to be below the Site Specific Noise Limits at all NALs, when considering the Vestas V162 7.2 MW with serrated trailing edge blades, as a candidate turbine.

7.1.6 The Vestas turbine model was chosen as it is considered to be representative of the type of turbine that could be installed at the Site. There are a number of wind turbine makes and models that may be suitable for the Proposed Development. Should the proposal receive consent, the final choice of turbine would be subject to a competitive tendering process. The final choice of turbine would, however, have to meet the noise limits determined and contained within any condition imposed.

8 Glossary of Terms

AOD: Above Ordnance Datum is the height above sea level.

Amplitude Modulation: a variation in noise level over time; for example observers may describe a 'whoosh whoosh' sound, which can be heard close to a wind turbine as the blades sweep past.

Attenuation: the reduction in level of a sound between the source and a receiver due to any combination of effects including: distance, atmospheric absorption, acoustic screening, the presence of a building façade, etc.

Background Sound: the sound level rarely fallen below in any given location over any given time period, often classed according to daytime, evening or night-time periods. The L_{A90} indices (see below) is often used to represent the background sound level.

Bin: subset or group into which data can be sorted; in the case of wind speeds, bins are often centred on integer wind speeds with a width of 1 m/s. For example the 4 m/s bin would include all data with wind speeds of 3.5 to 4.5 m/s.

Broadband Noise: noise with components over a wide range of frequencies.

Decibel (dB): the ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. A logarithmic scale is used in noise level measurements because of this wide range. The scale used is the decibel (dB) scale which extends from 0 to 140 decibels (dB) corresponding to the intensity of the sound level.

dBA: the ear has the ability to recognise a particular sound depending on its pitch or frequency. Microphones cannot differentiate noise in the same way as the ear, and to counter this weakness the noise measuring instrument applies a correction to correspond more closely to the frequency response of the human ear. The correction factor is called 'A Weighting' and the resulting measurements are written as dBA. The dBA is internationally accepted and has been found to correspond well with people's subjective reaction to noise. Some typical subjective changes in noise levels are:

- a change of 3 dBA is just perceptible;
- a change of 5 dBA is clearly perceptible;
- a change of 10 dBA is twice (or half) as loud.

Directivity: the property of a sound source that causes more sound to be radiated in one direction than another.

Frequency: the pitch of a sound in Hz or kHz. See Hertz.

Ground Effects: the modification of sound at a receiver location due to the interaction of the sound wave with the ground along its propagation path from source to receiver. Described using the term 'G', and ranges between 0 (hard), 0.5 (mixed) and 1 (soft).

Hertz (Hz): sound frequency refers to how quickly the air vibrates, or how close the sound waves are to each other (in cycles per second, or Hertz (Hz)).

L_w: is the sound power level. It is a measure of the total noise energy radiated by a source of noise, and is used to calculate noise levels at a distant location. The L_{WA} is the A-weighted sound power level.

L_{eq}: is the equivalent continuous sound level, and is the sound level of a steady sound with the same energy as a fluctuating sound over the same period. It is possible to consider this level as the ambient noise encompassing all noise at a given time. The $LA_{eq,T}$ is the A-weighted equivalent continuous sound level over a given time period (T).

L_{90}: index represents the noise level exceeded for 90 percent of the measurement period and is used to indicate quieter times during the measurement period. It is often used to measure the background sound level. The $L_{A90,10min}$ is the A-weighted background sound level over a 10 minute measurement sample.

Noise emission: the noise energy emitted by a source (e.g. a wind turbine).

Noise immission: the sound pressure level detected at a given location (e.g. the nearest dwelling).

Night-time Hours: ARWTN defines the night-time hours as 23.00 to 07.00 every day.

Quiet Daytime Hours: ARWTN defines the amenity hours as 18.00 to 23.00 Monday to Friday, 13.00 to 23.00 on Saturdays and 07.00 to 23.00 on Sundays.

Sound Level Meter: an instrument for measuring sound pressure level.

Sound Power Level: the total sound power radiated by a source, in decibels.

Sound Pressure Level: a measure of the sound pressure at a point, in decibels**.**

Standardised Wind Speed: a wind speed measured at a height different than 10 m (generally measured at the turbine hub height) which is expressed to a reference height of 10 m using a roughness length of 0.05 for standardisation purpose (in accordance with the IEC 61400-11 standard).

Tonal Noise: noise which covers a very restricted range of frequencies (e.g. a range of ≤20 Hz). This noise can be more annoying than broadband noise.

Wind Shear: the increase of wind speed with height above the ground.

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Annex 1 – Figures

N

NAL10 - Earlsburn Cottage

NAL11 - Ryecroft

NAL9 - Easter Cringate Cottage

NAL8 - Easter Cringate

NAL7 - Cairnoch Lodge

NAL6 - Todholes

NAL5 - Gartcarron Fintry

T1

T2

T3

T4

NAL3 - Cairnoch Farm

NAL4 - Cairnoch Bothy

NAL1 - Glendales Farmhouse

NAL2 - Reservoir Keepers House

Hart Hill

Cringate Muir

Cringate

Cairnoch Hill

River Carron

Craigengelt Hill

Earls Hill

Kilsyth

Cumbernauld

Stirling

Bannockburn

Denny

Bonnybridge

Lennoxtown

Campsie Fells

0 0.5 1 Kilometre

LEGEND

Site Boundary

Noise Assessment Locations (NALs)

Site Name

Cairnoch Hill Wind Farm (Proposed Development)

Rev.	Date	Amendment Details	Drawn	Approved
0	21/05/2026	FIRST ISSUE	AD	AB

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Project Title: CAIRNOCH HILL WIND FARM

Drawing Title: TECHNICAL APPENDIX 13.2 - ANNEX 1 - FIGURE 13.2.1

Scale: 1:18,000 | Size: A3 | Spatial Reference: British National Grid

Drawing Number: 16646-008

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N

T1
T2
T3
T4

NAL1
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NAL5
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NAL11

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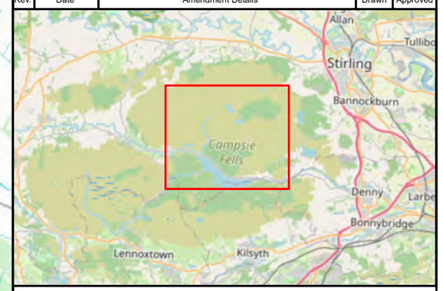
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- Site Boundary
- Noise Assessment Locations (NALs)

Site Name

- Cairnoch Hill Wind Farm (Proposed Development)
- Craigannet Farm
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn Extension Wind Farm
- Earlsburn North Wind Farm
- Earlsburn Wind Farm
- Shelloch Wind Farm

Rev.	Date	Amendment Details	Drawn	Approved
1	14/07/2026	REMOVAL OF EASTER CRINGATE TURBINE	ST	GC
0	21/05/2026	FIRST ISSUE	AD	AB



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Client
Eurowind Energy

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FOR PLANNING

Project Title:
CAIRNOCH HILL WIND FARM

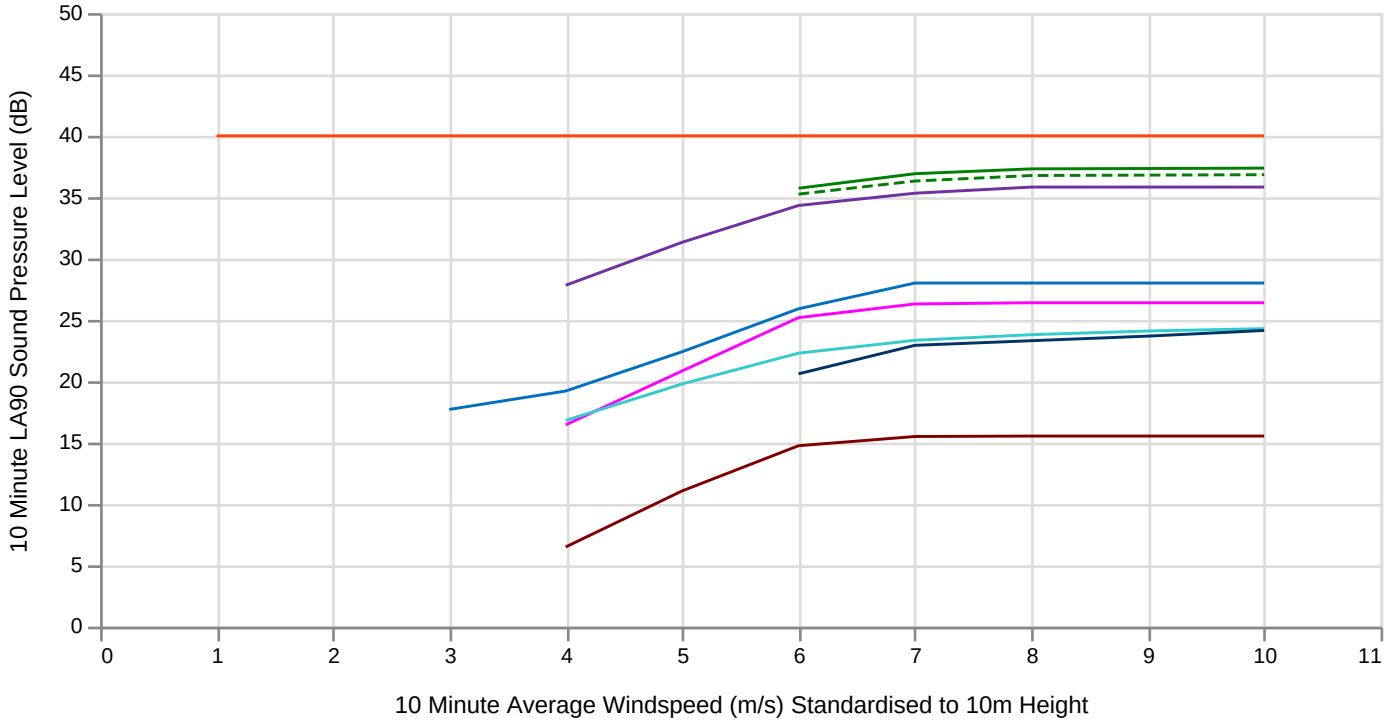
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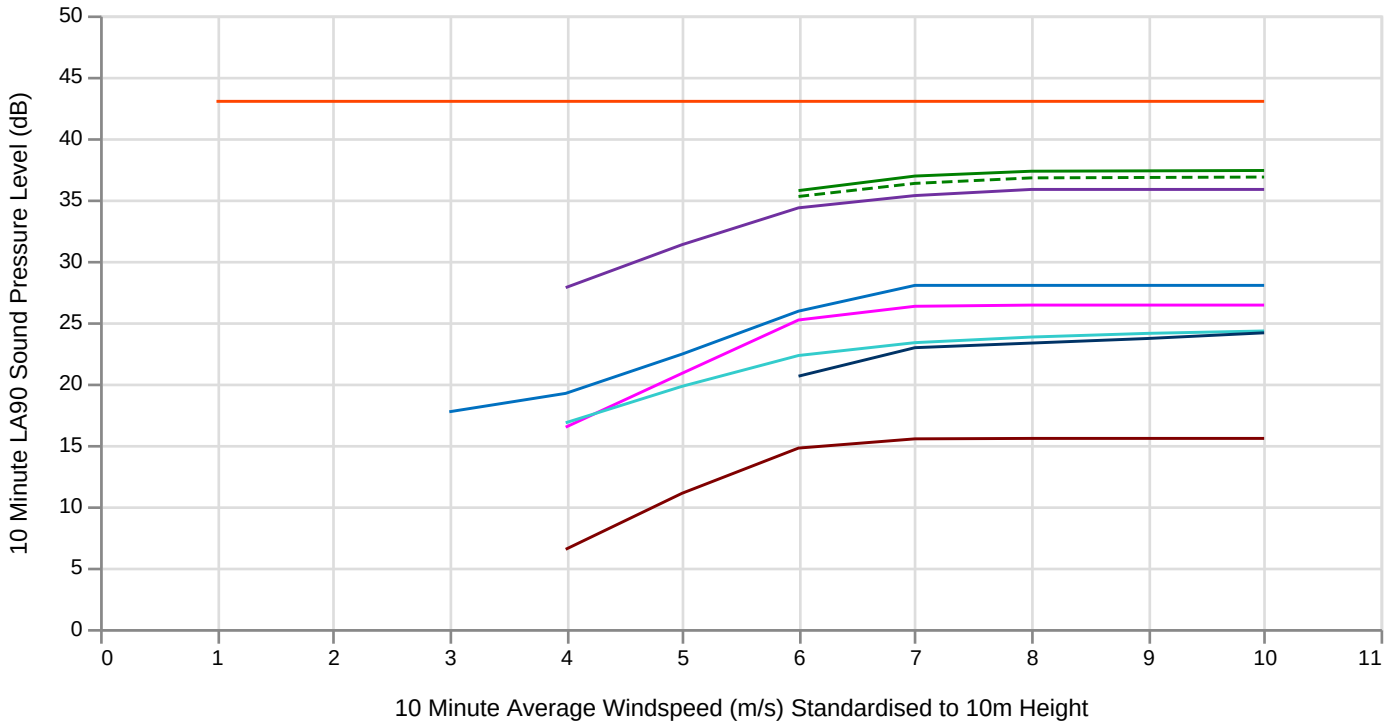
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Daytime - NAL1 - Glendales Farmhouse



Night time - NAL1 - Glendales Farmhouse

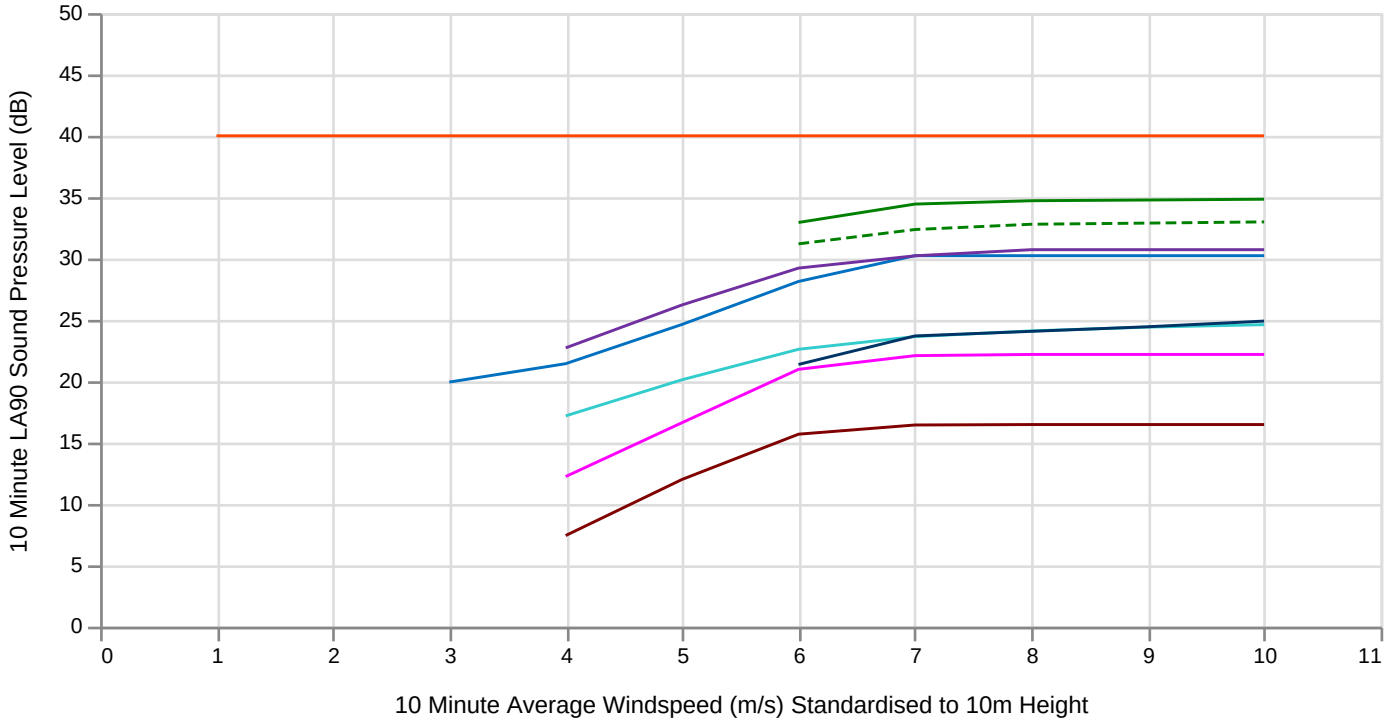


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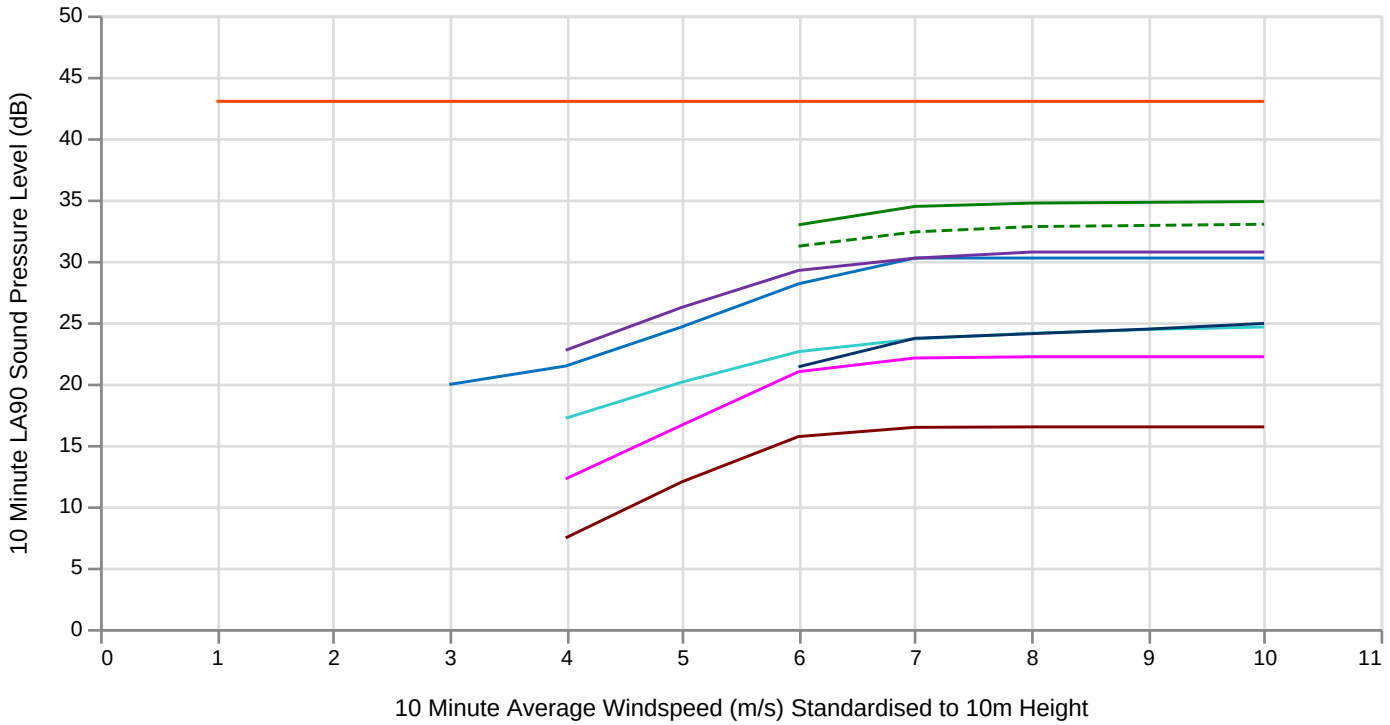
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- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL2 - Reservoir Keepers House



Night time - NAL2 - Reservoir Keepers House

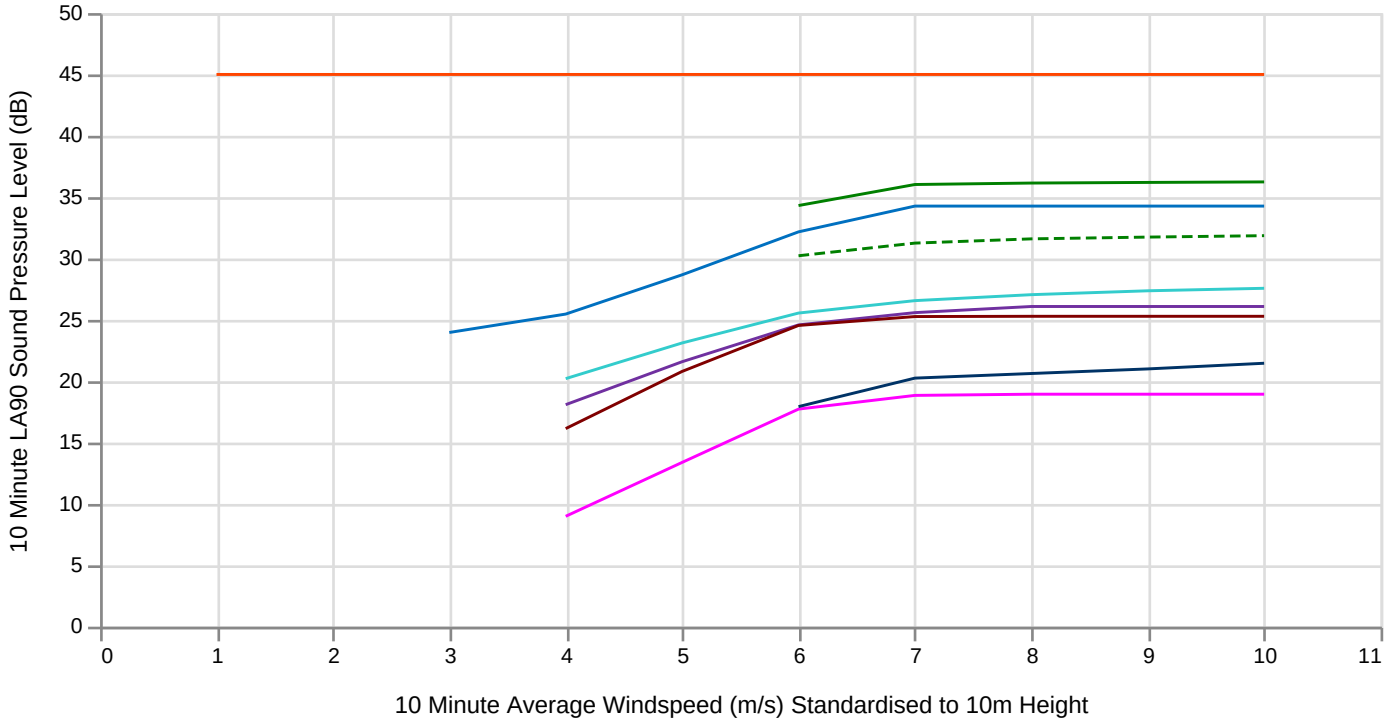


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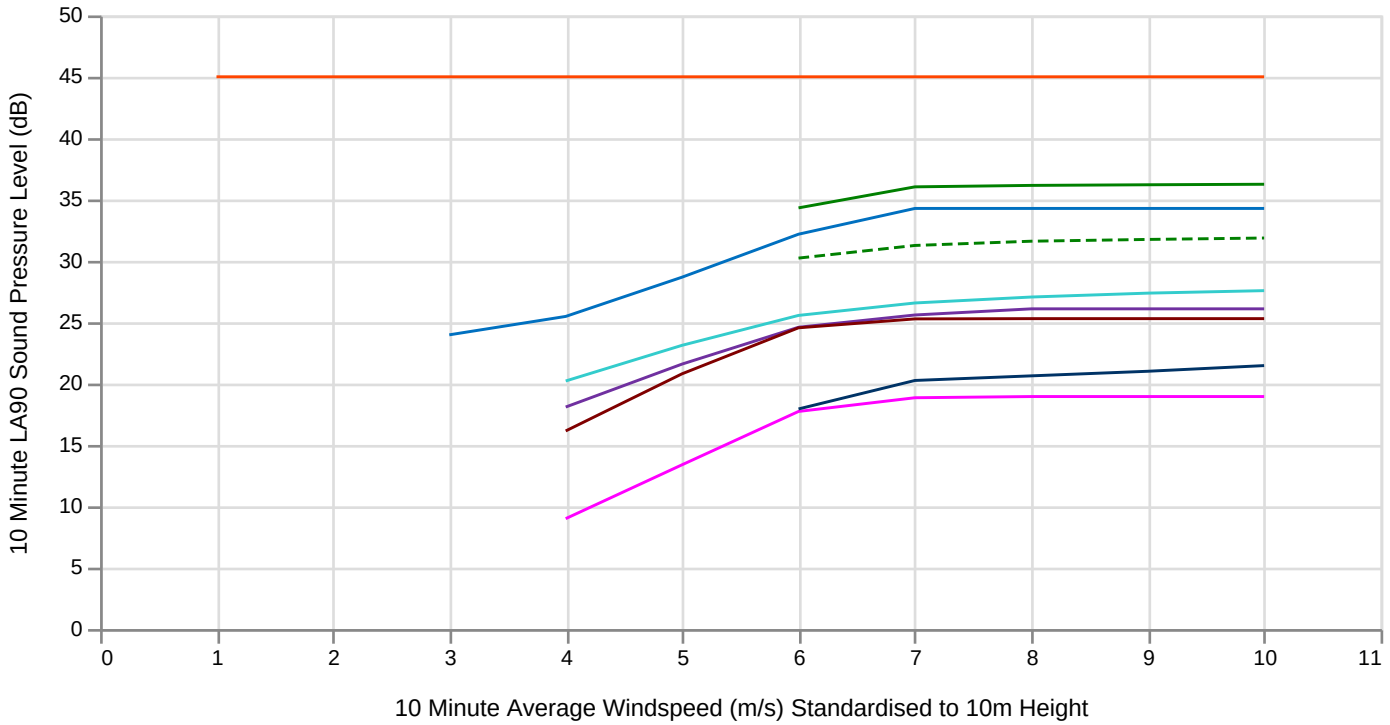
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Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
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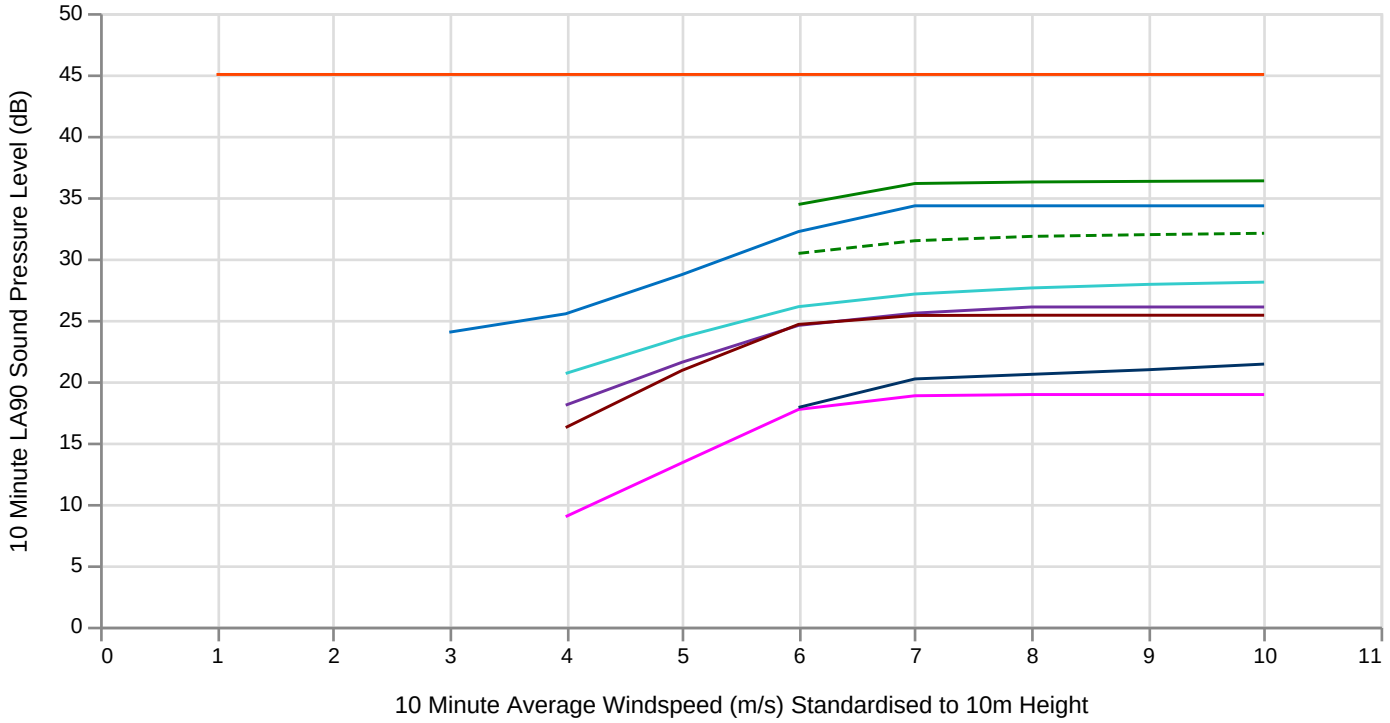


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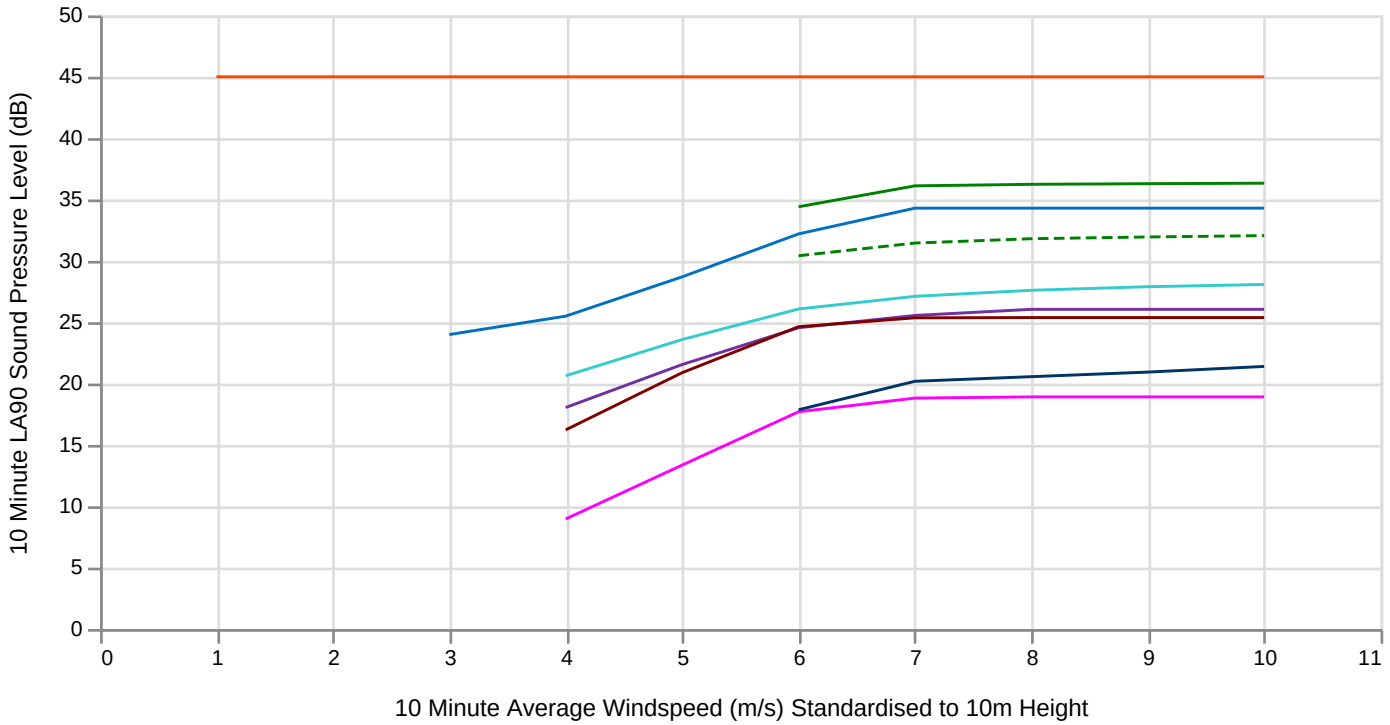
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Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
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Night time - NAL4 - Cairnoch Bothy, FI with Proposed Development

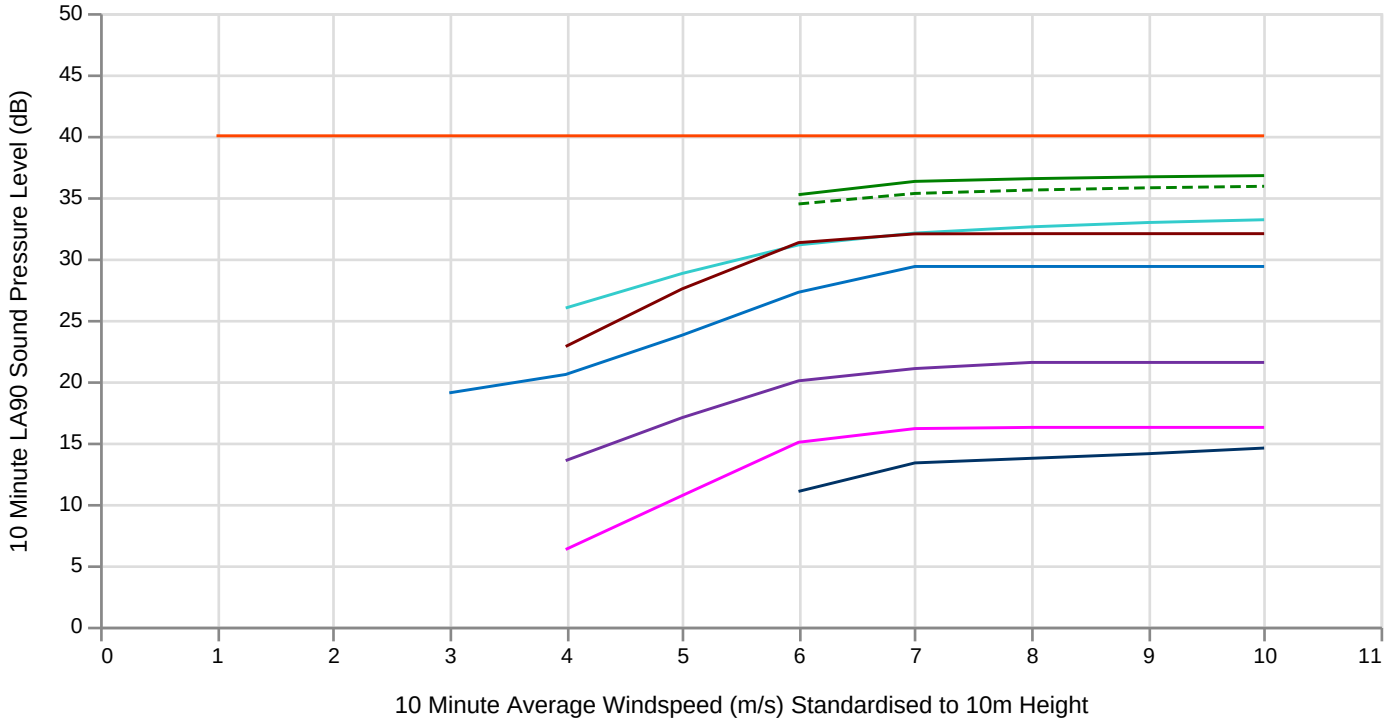


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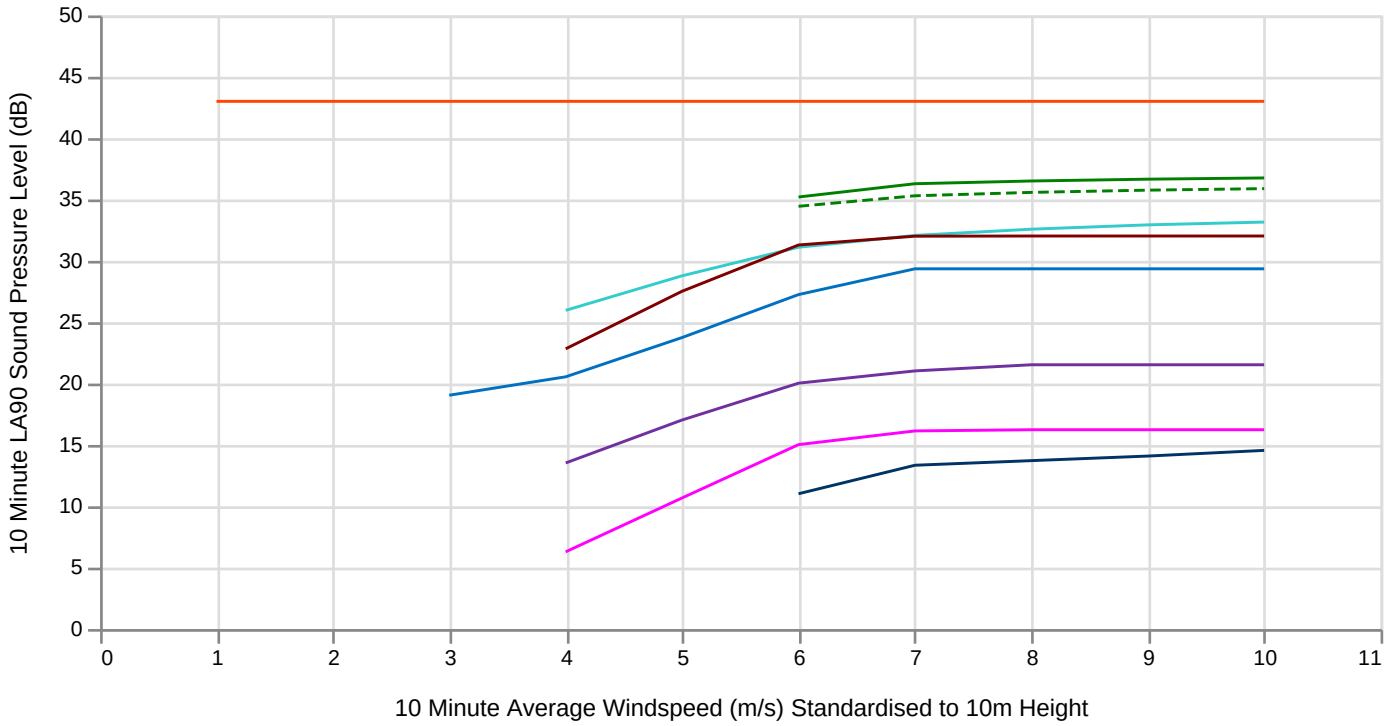
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- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
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Daytime - NAL5 - Gartcarron Fintry



Night time - NAL5 - Gartcarron Fintry

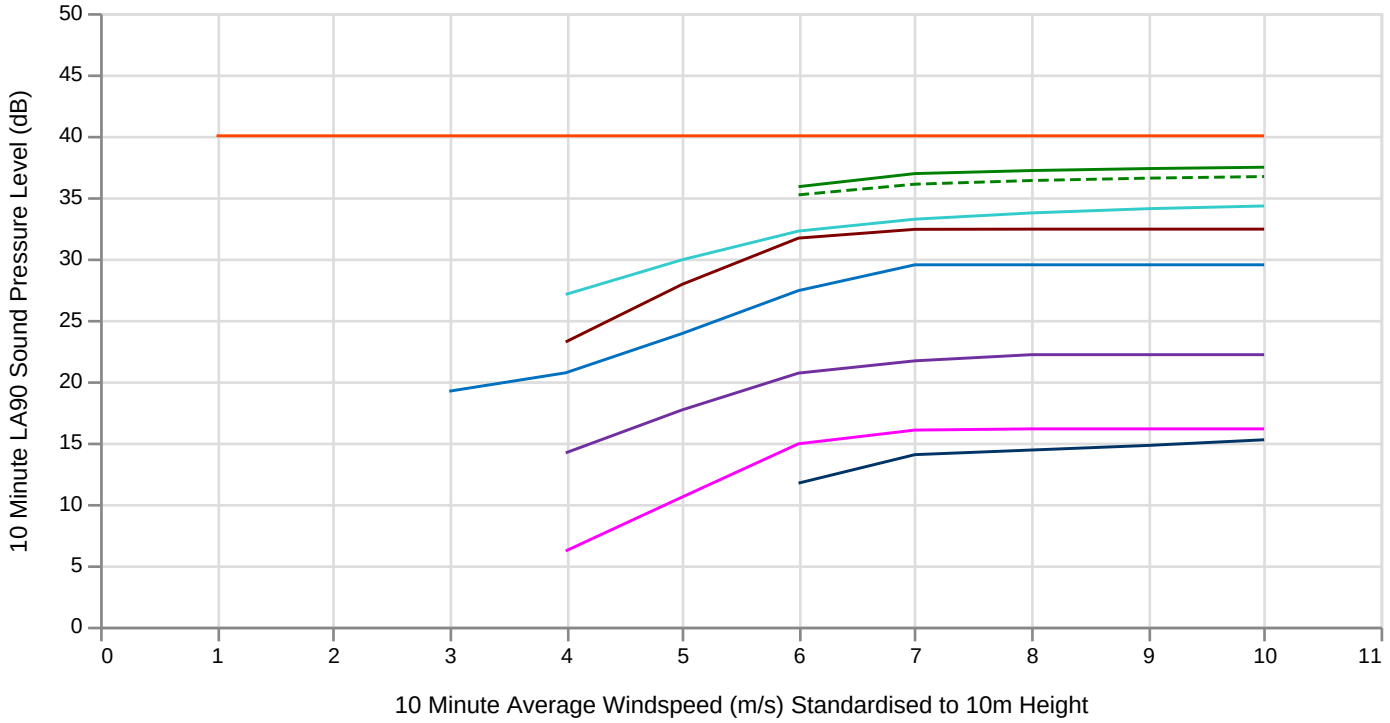


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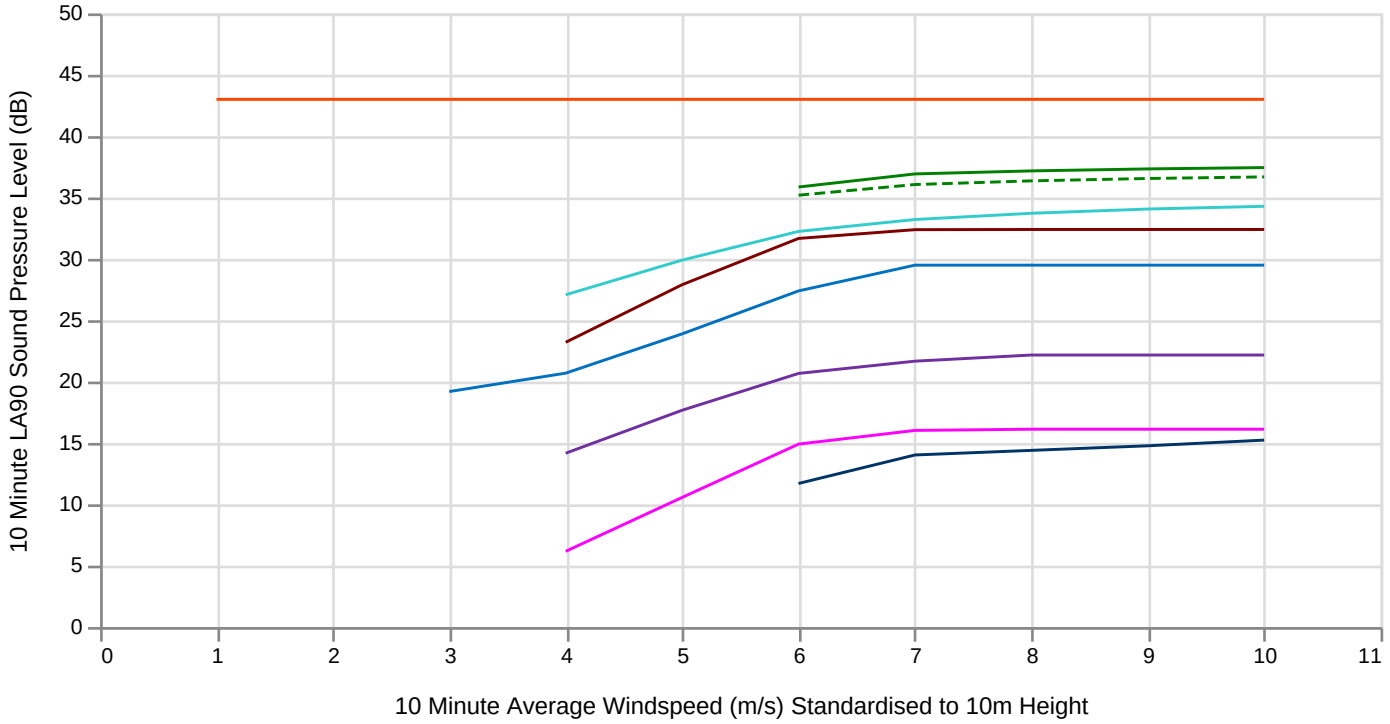
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- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
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Date	2026-07-28

Daytime - NAL6 - Todholes



Night time - NAL6 - Todholes

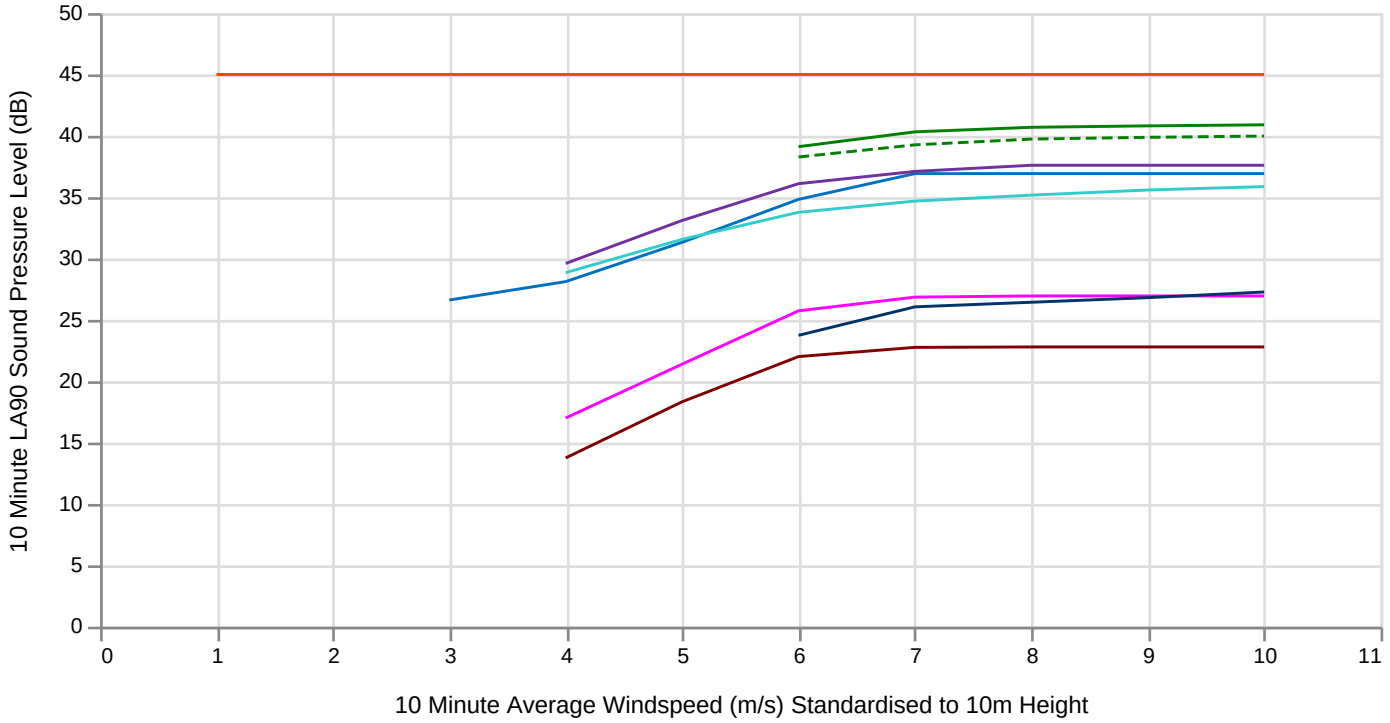


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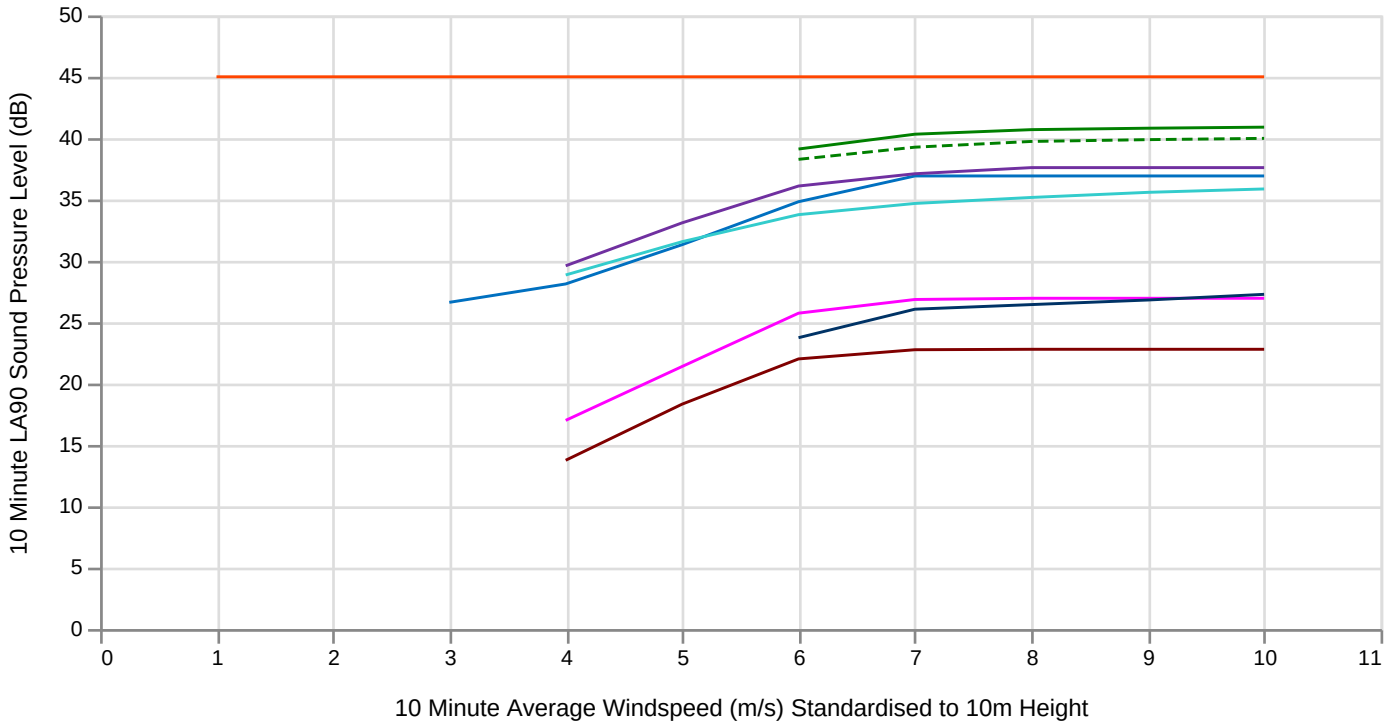
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- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL7 - Cairnoch Lodge, FI with Proposed Development



Night time - NAL7 - Cairnoch Lodge, FI with Proposed Development

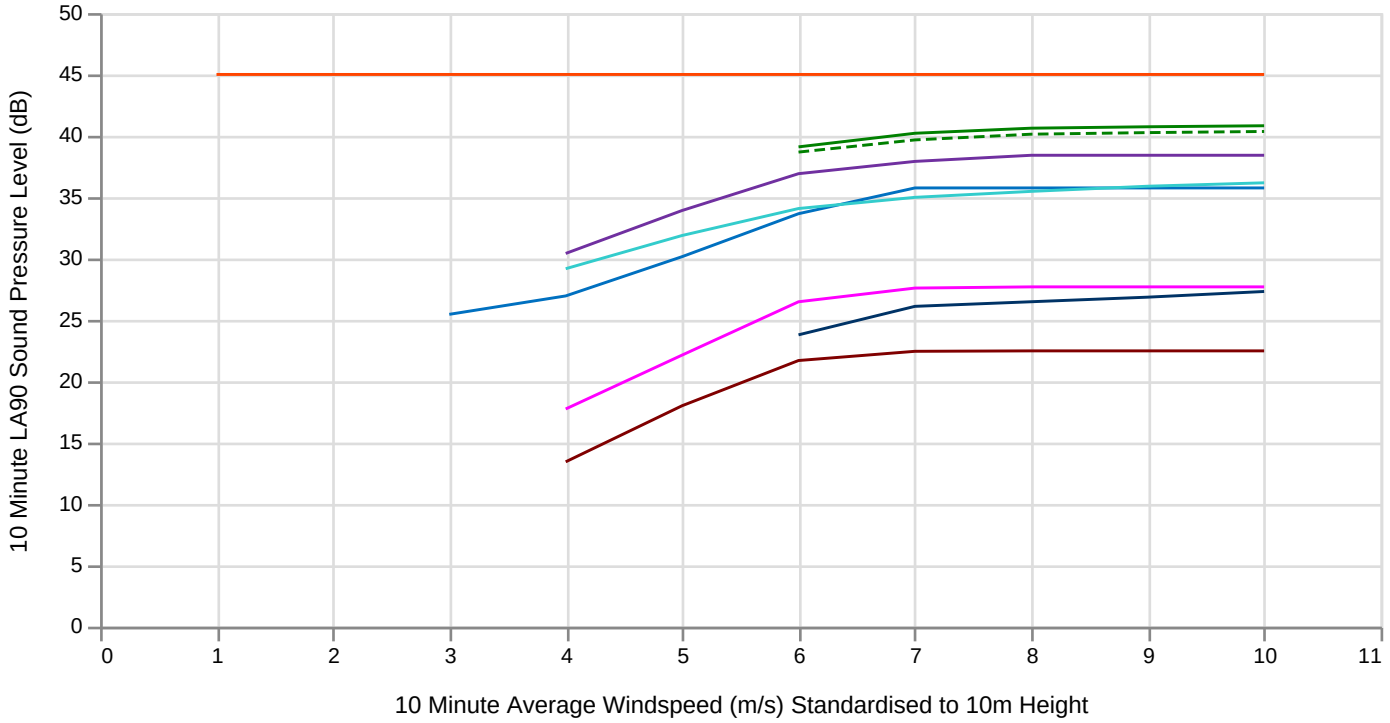


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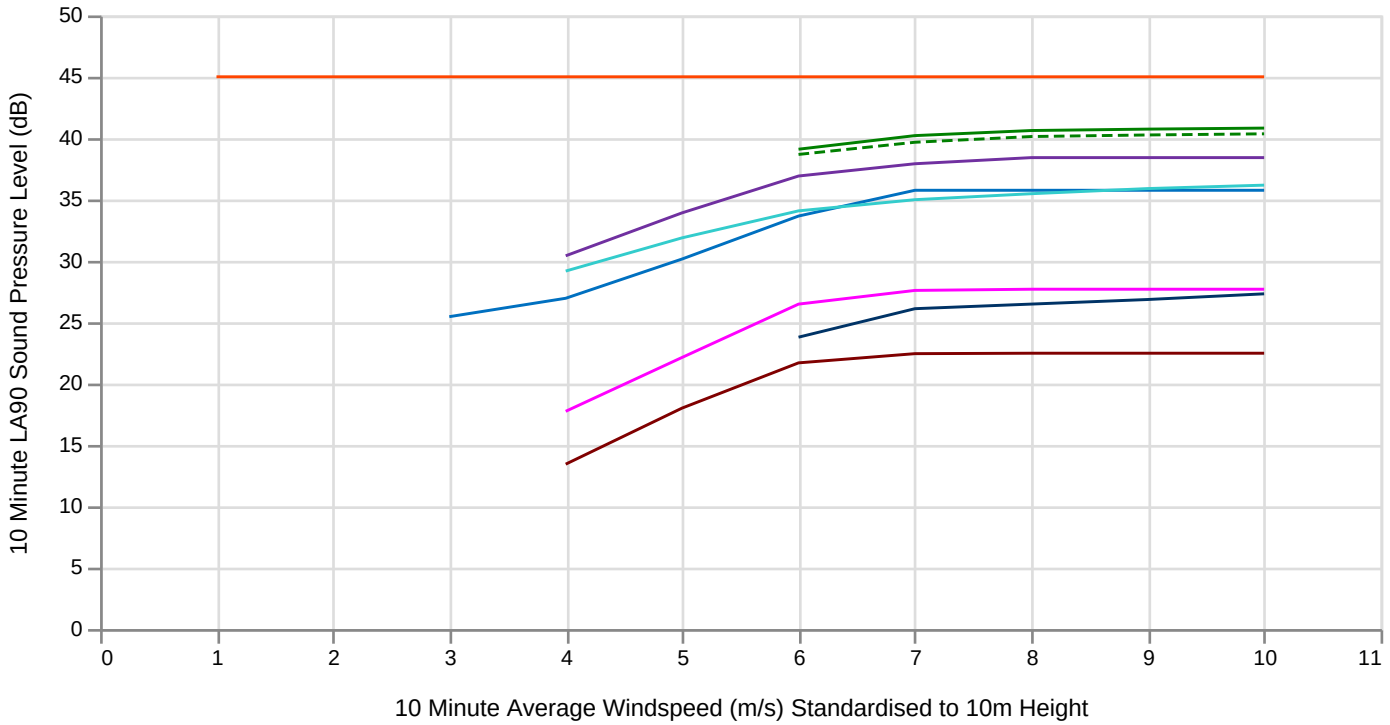
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- Drummarnock Wind Farm
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- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL8 - Easter Cringate, FI with Proposed Development



Night time - NAL8 - Easter Cringate, FI with Proposed Development

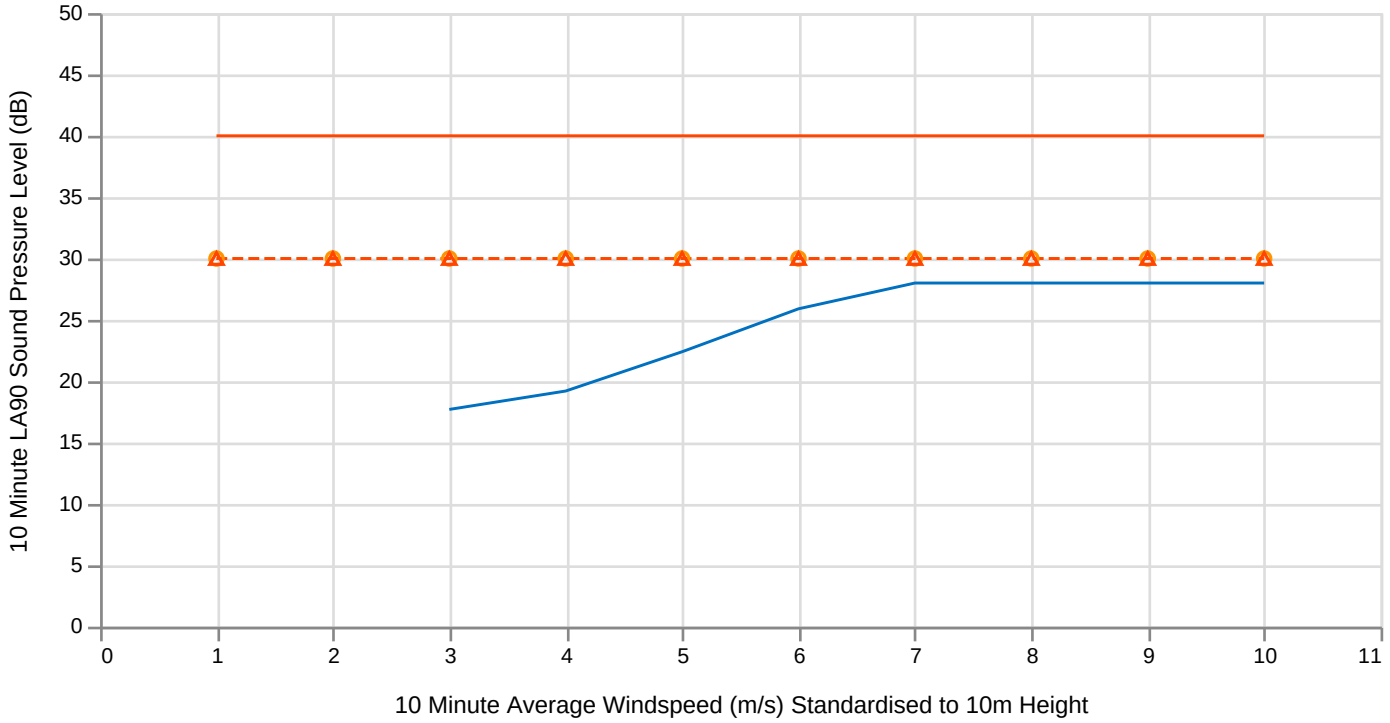


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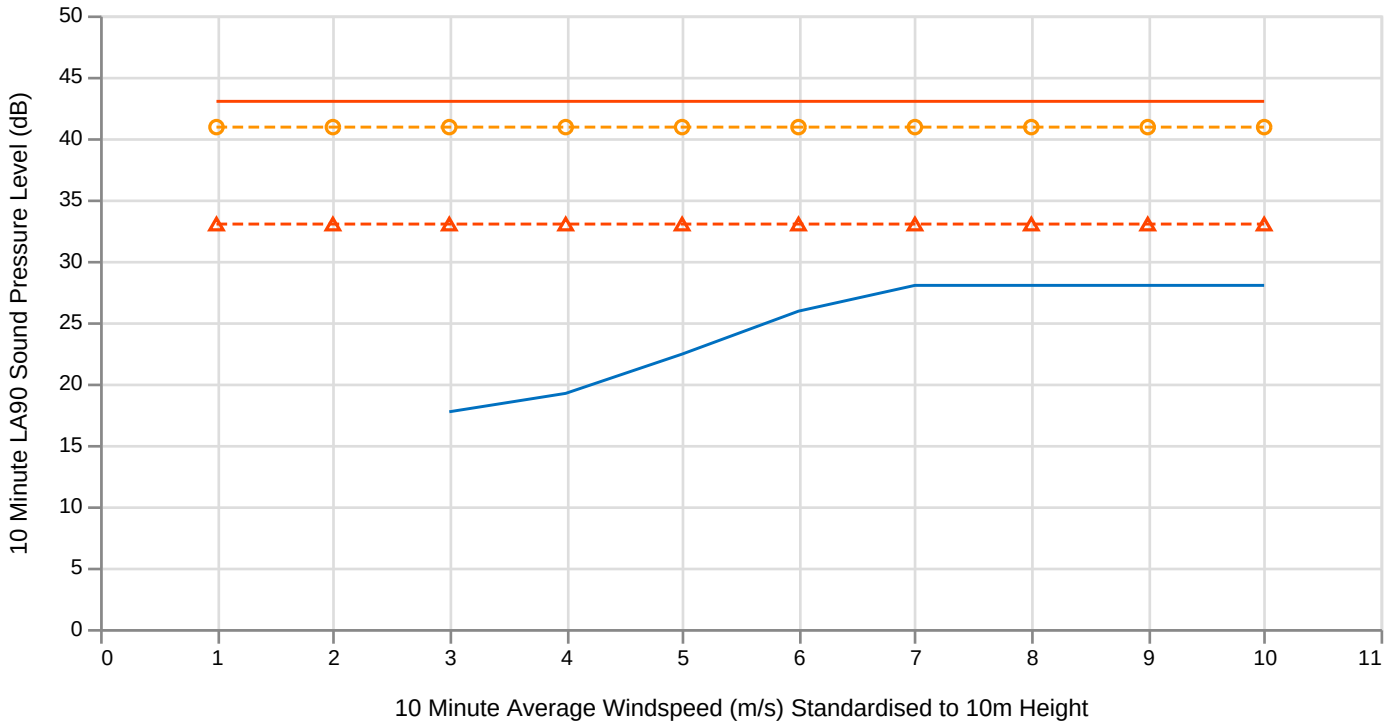
- Total Noise Assessement Criteria
- Proposed Development
- Cumulative (exc. the Prop. Dev.)
- Cumulative (inc. the Prop. Dev.)
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL1 - Glendales Farmhouse



Night time - NAL1 - Glendales Farmhouse

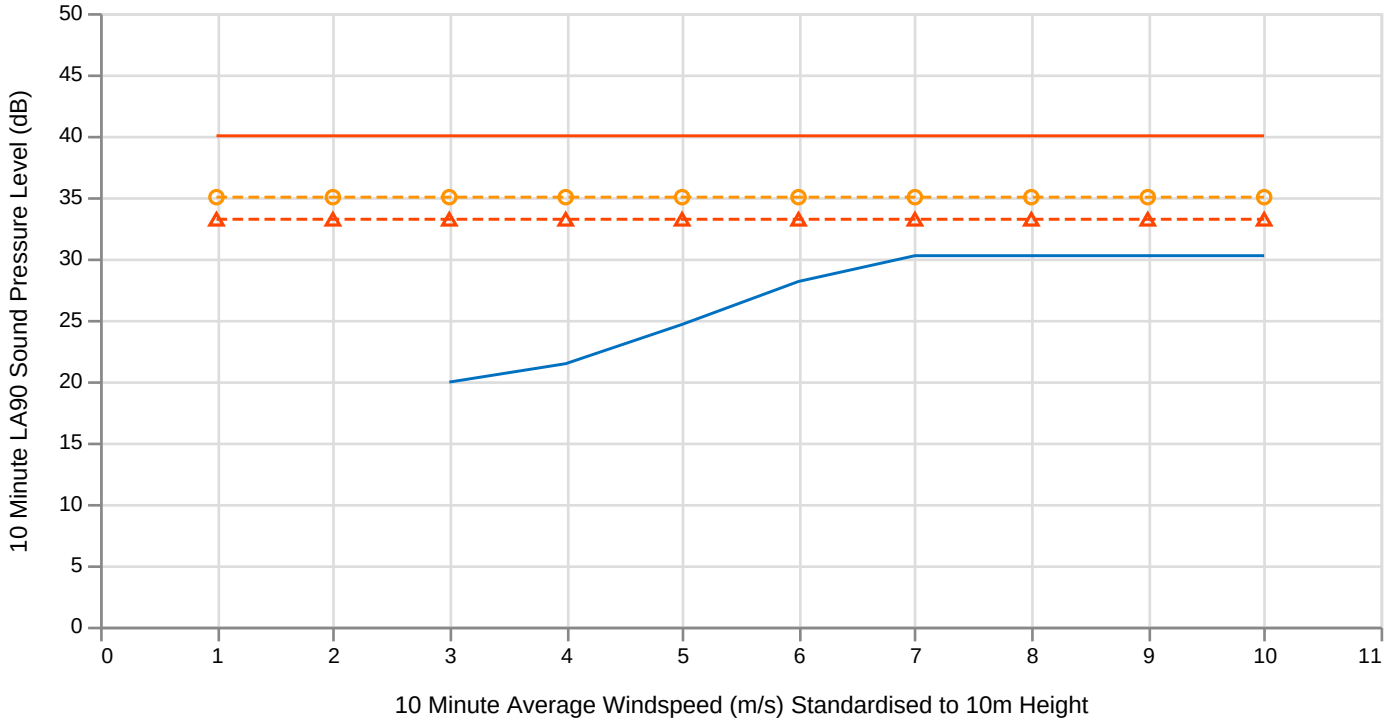


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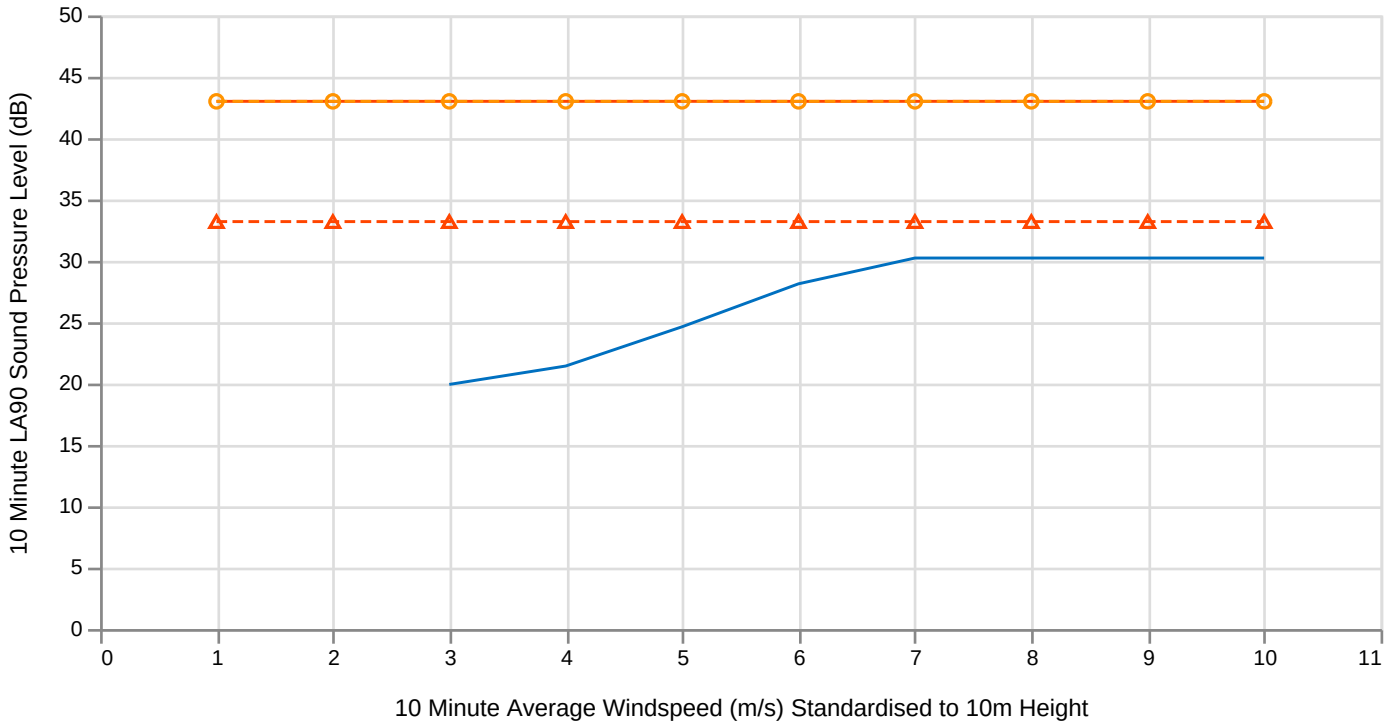
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL2 - Reservoir Keepers House



Night time - NAL2 - Reservoir Keepers House

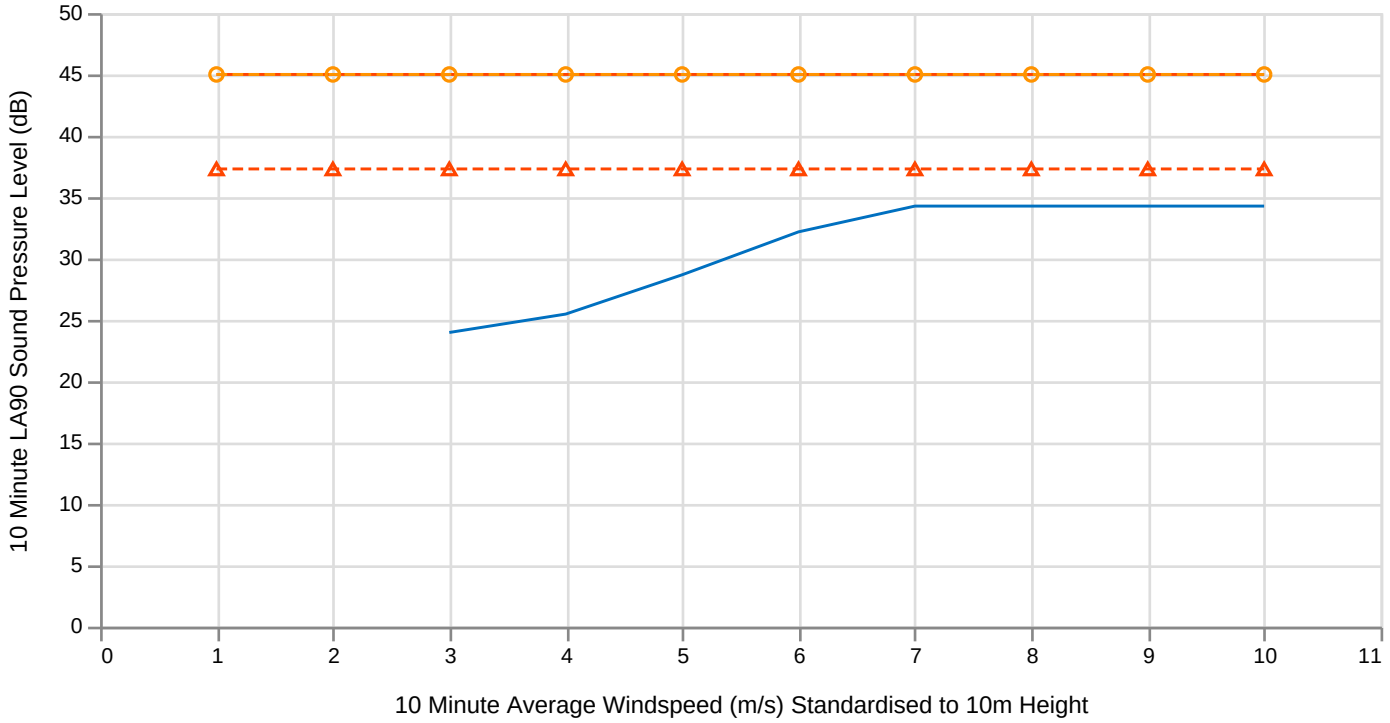


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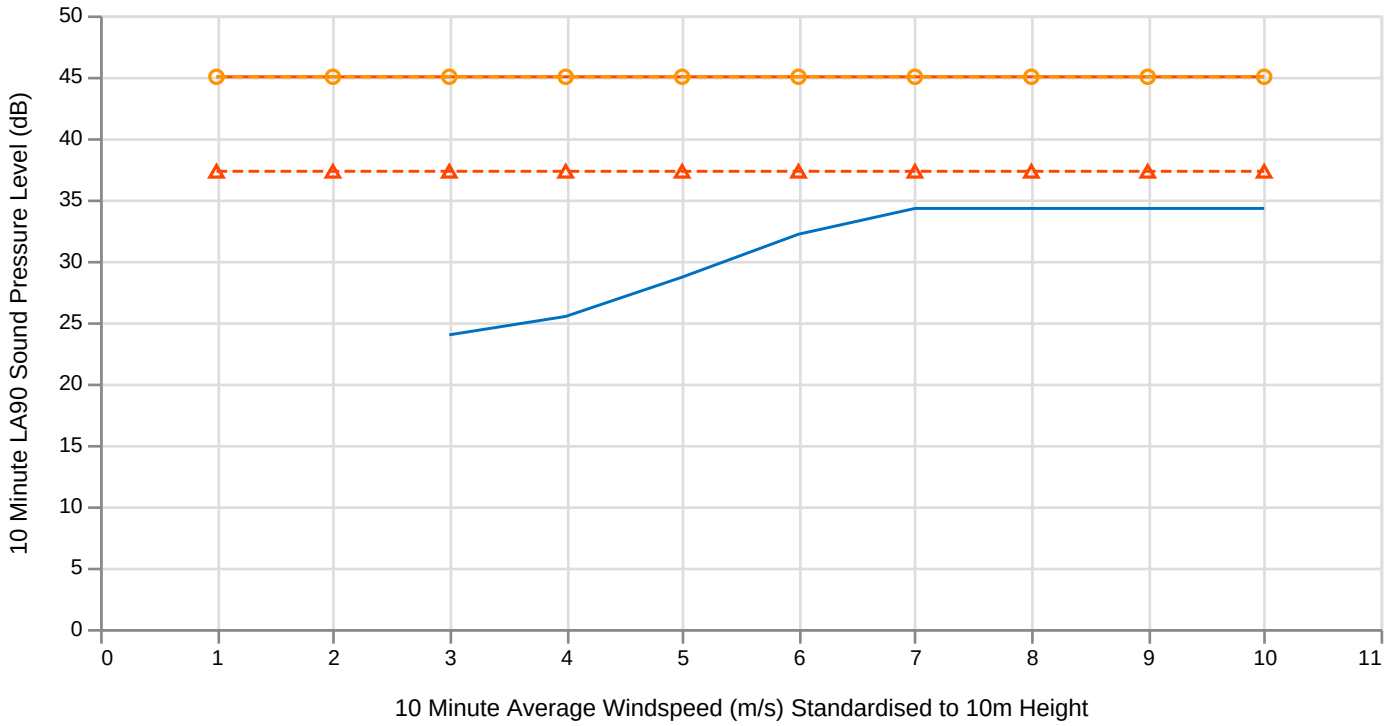
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL3 - Cairnoch Farm, FI with Proposed Development



Night time - NAL3 - Cairnoch Farm, FI with Proposed Development

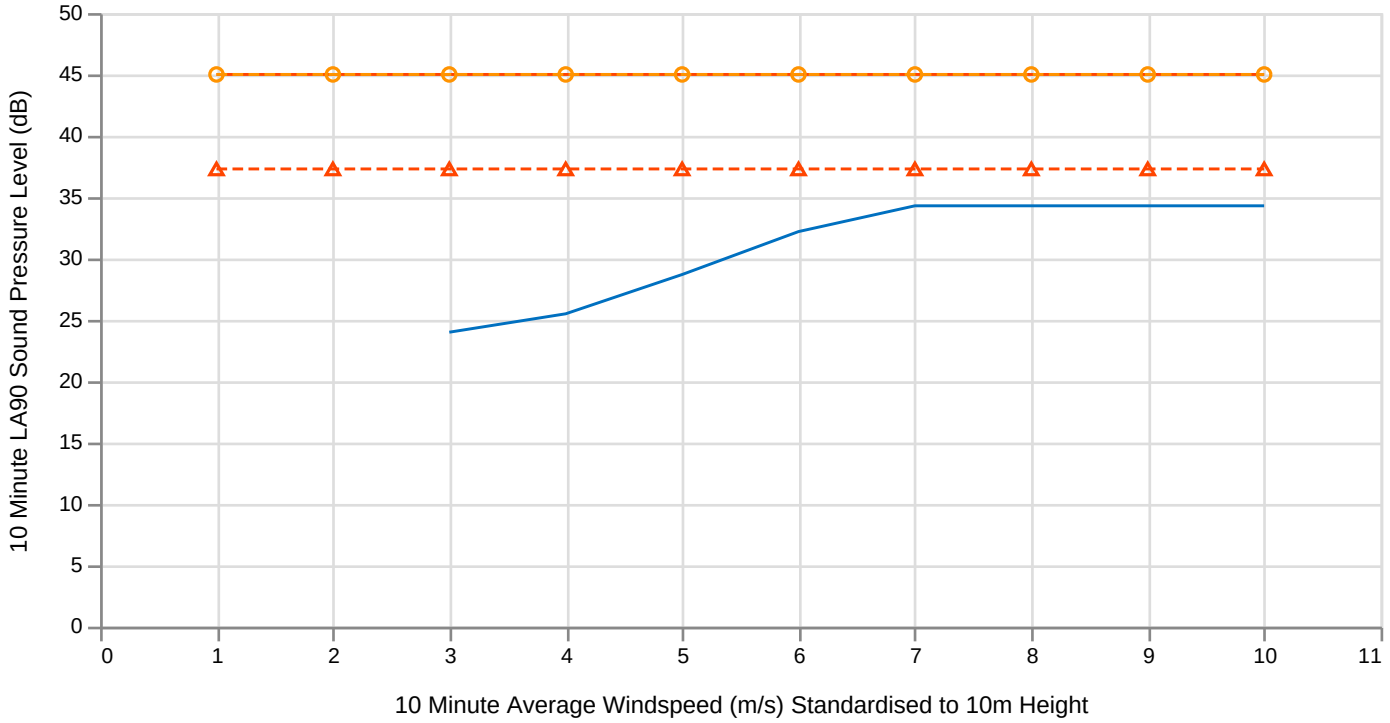


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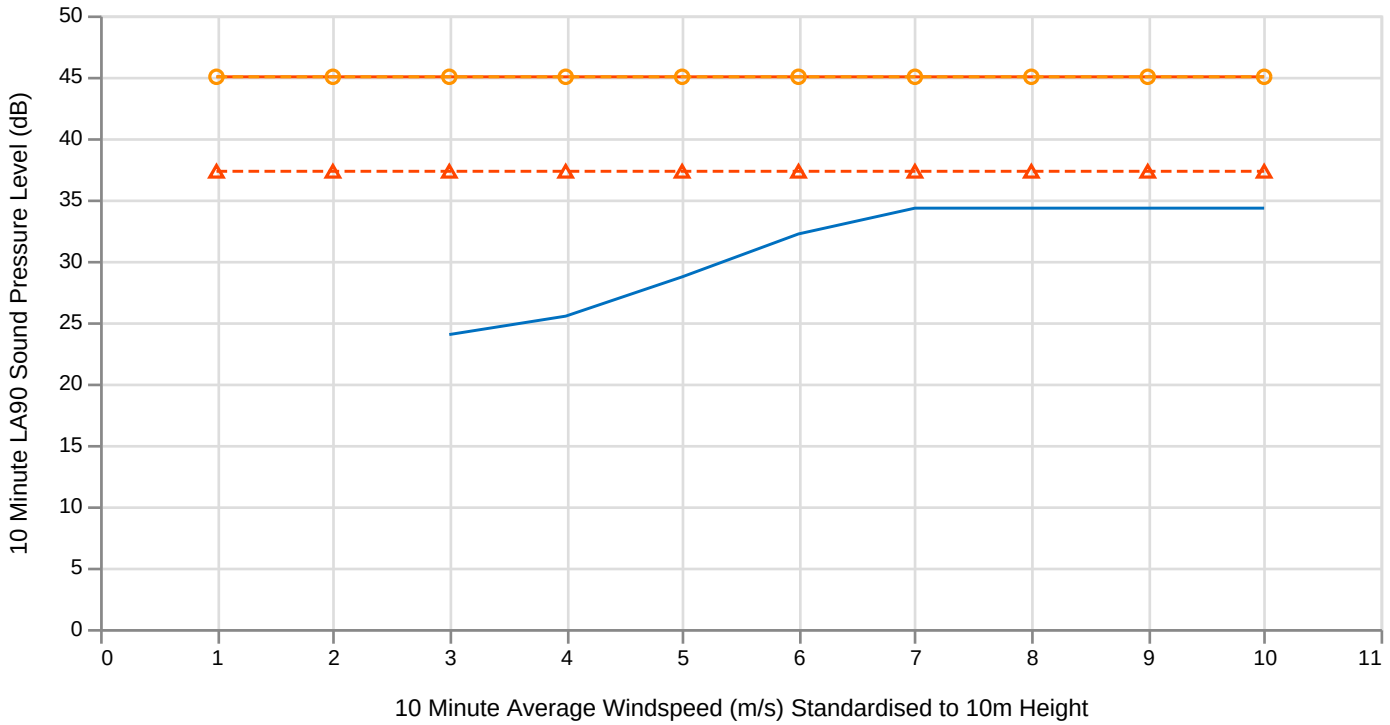
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL4 - Cairnoch Bothy, FI with Proposed Development



Night time - NAL4 - Cairnoch Bothy, FI with Proposed Development

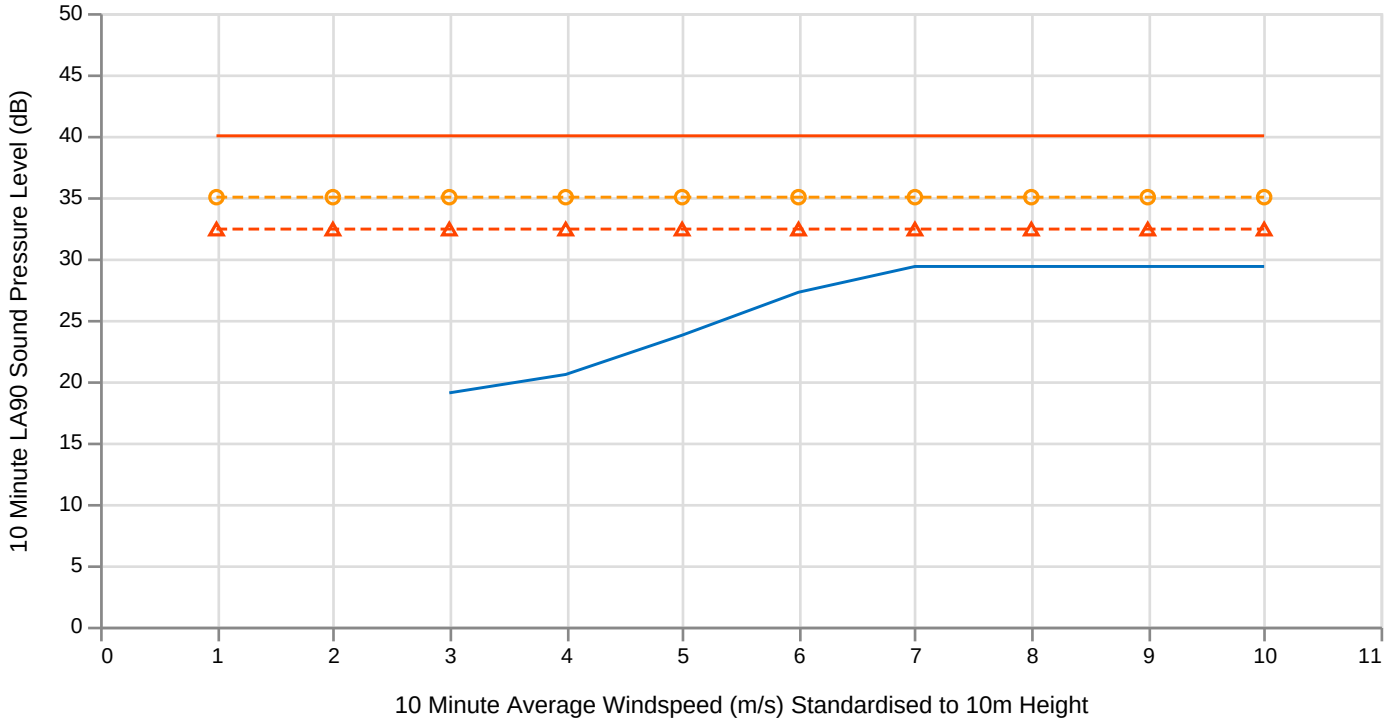


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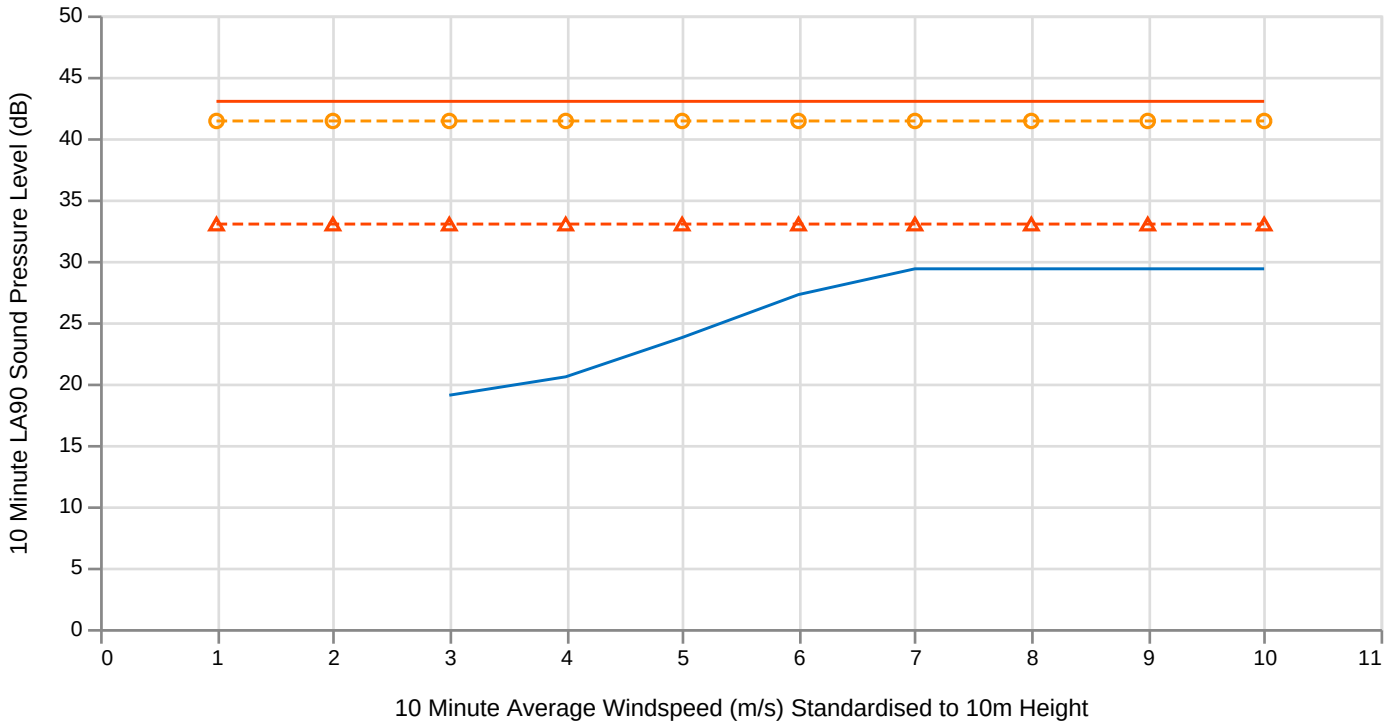
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL5 - Gartcarron Fintry



Night time - NAL5 - Gartcarron Fintry

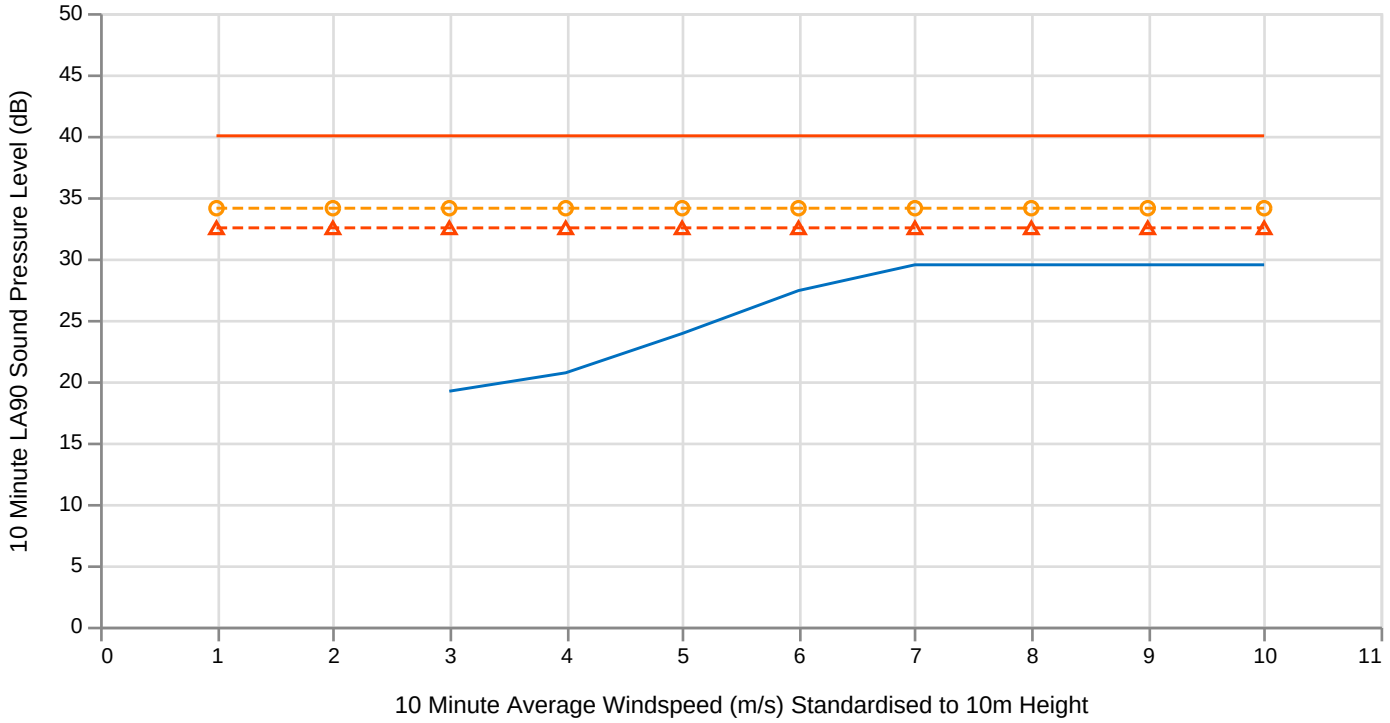


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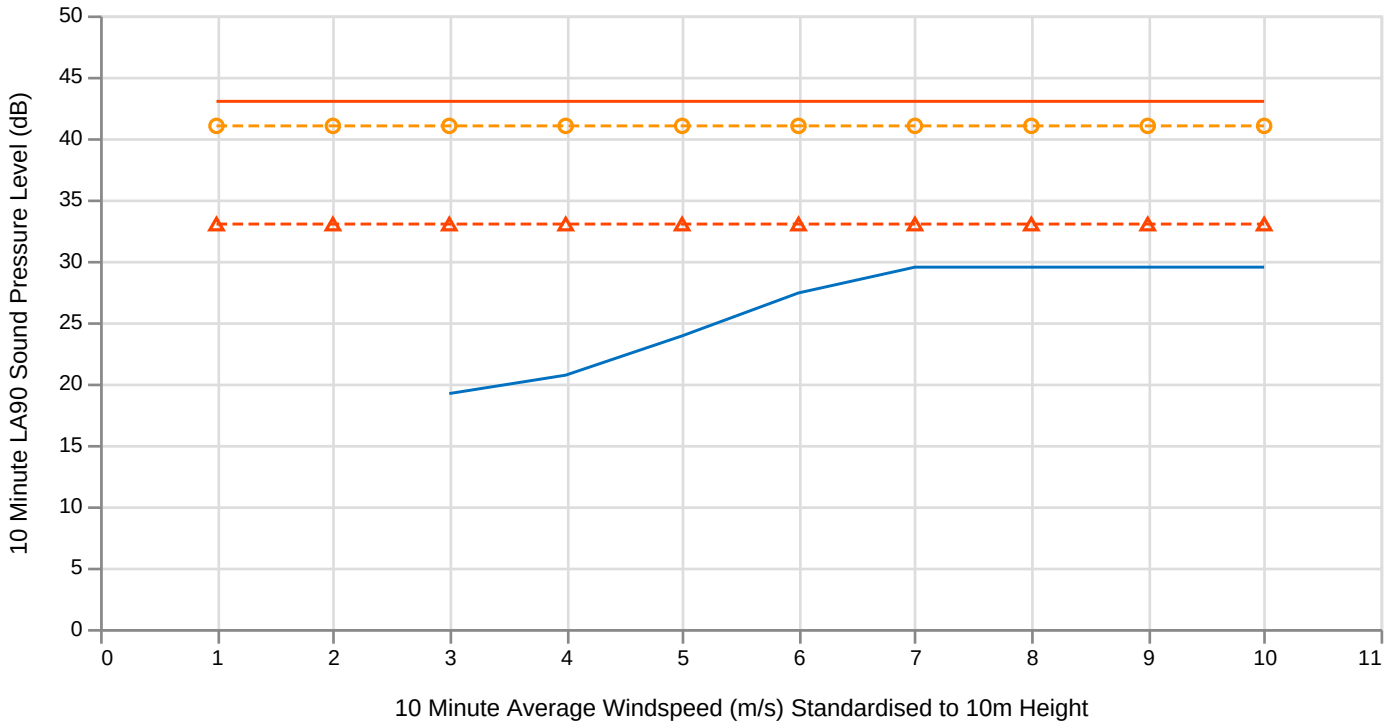
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL6 - Todholes



Night time - NAL6 - Todholes

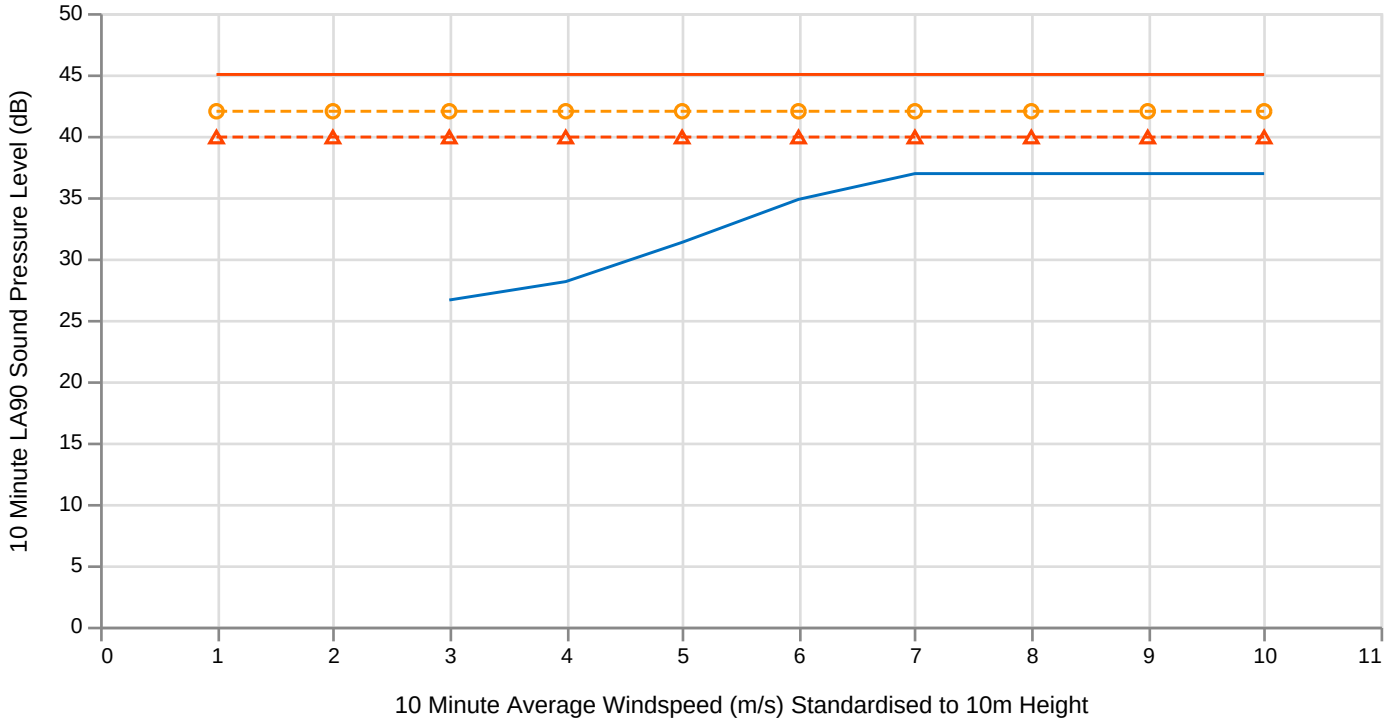


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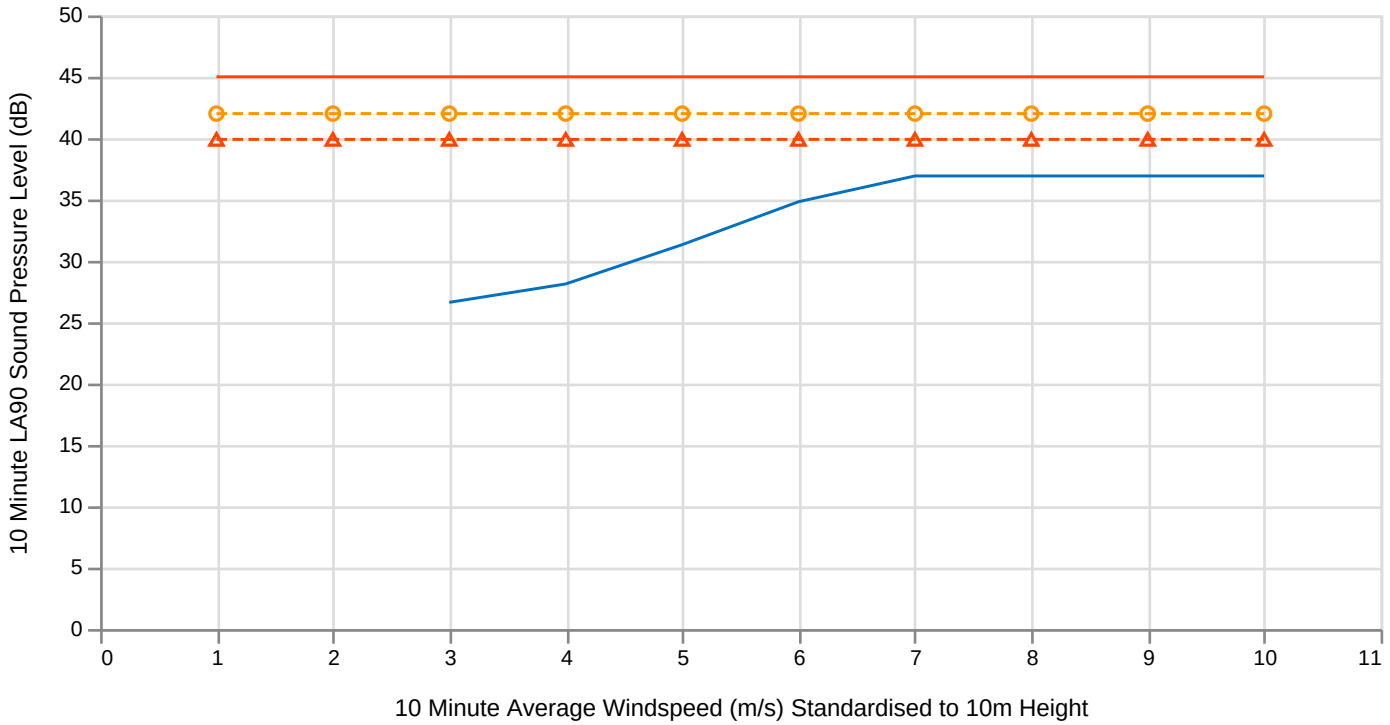
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL7 - Cairnoch Lodge, FI with Proposed Development



Night time - NAL7 - Cairnoch Lodge, FI with Proposed Development

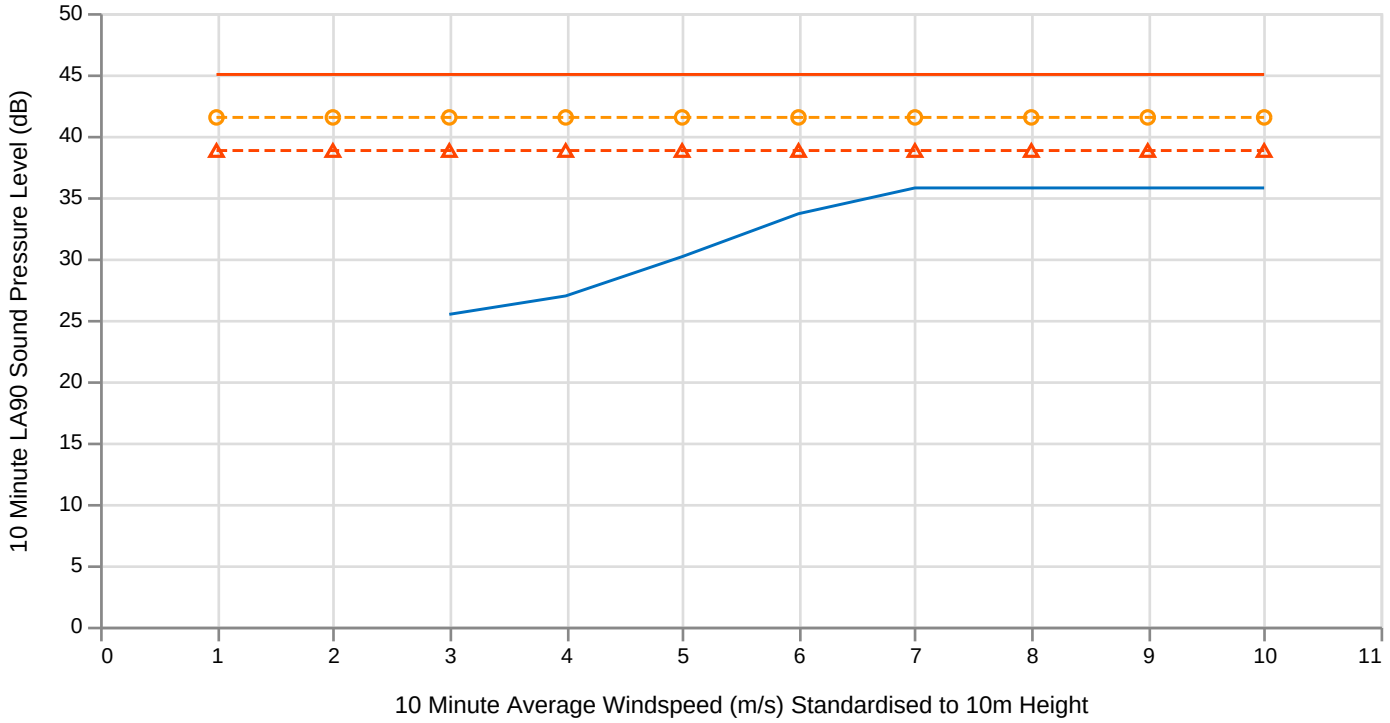


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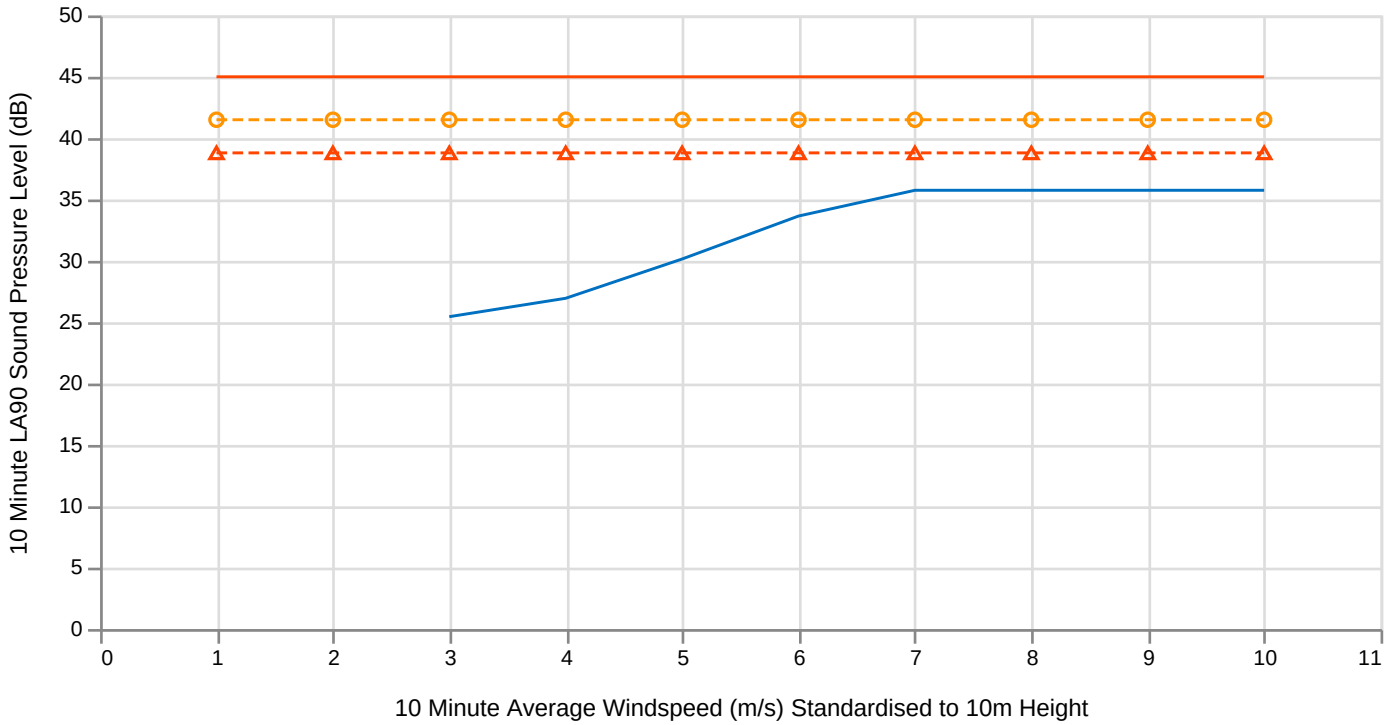
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL8 - Easter Cringate, FI with Proposed Development



Night time - NAL8 - Easter Cringate, FI with Proposed Development

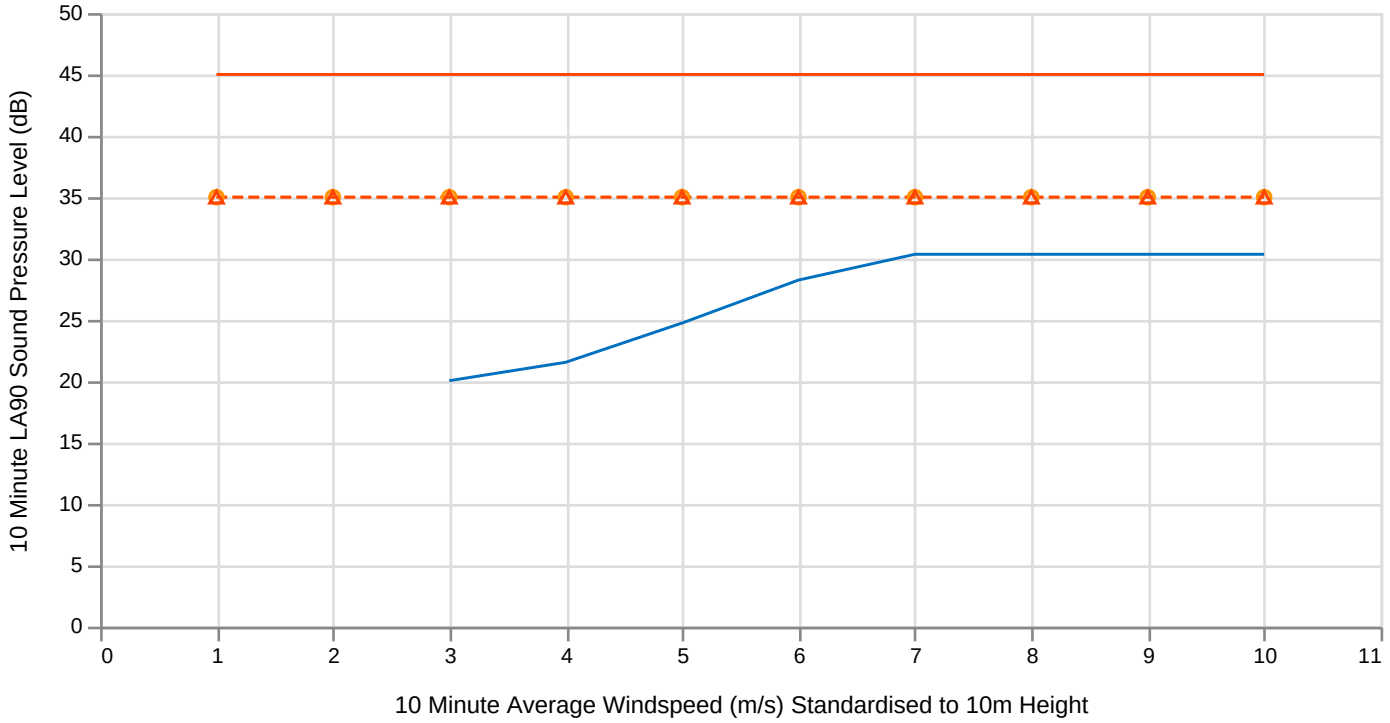


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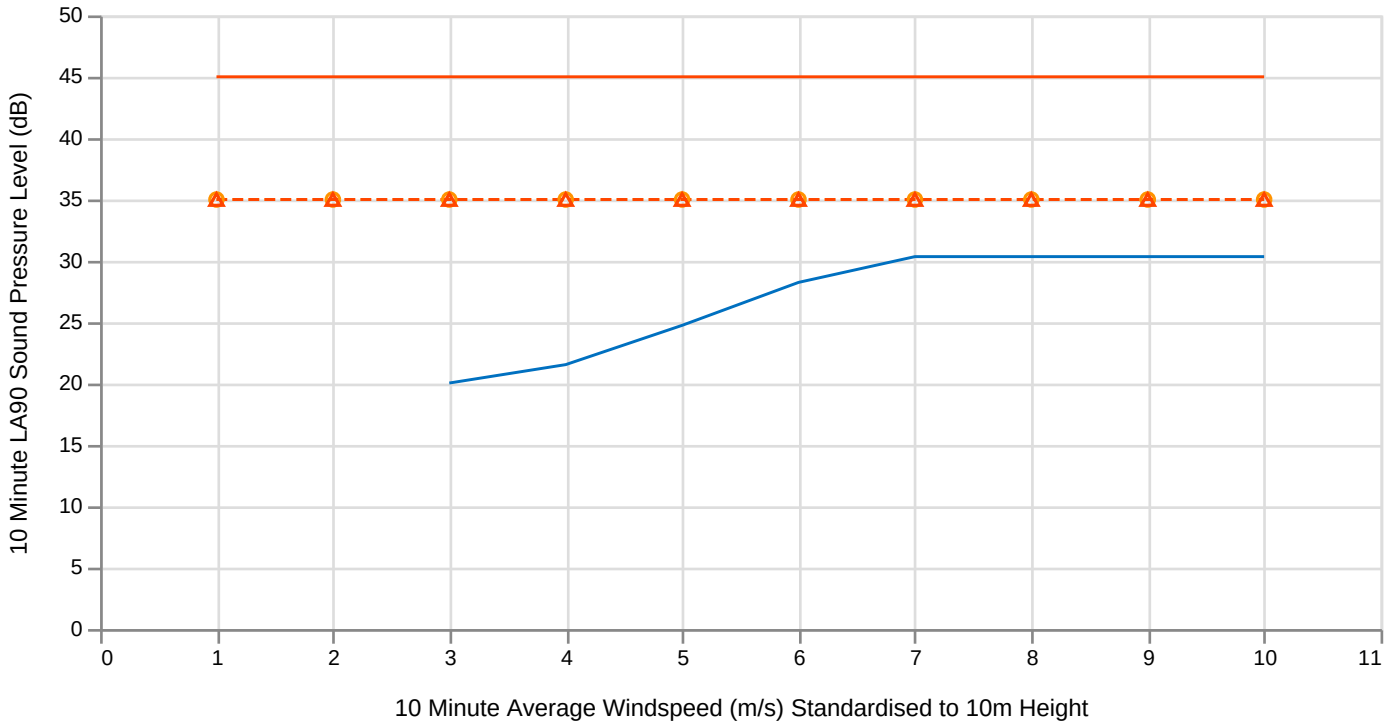
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL9 - Easter Cringate Cottage, FI with Craigengelt



Night time - NAL9 - Easter Cringate Cottage, FI with Craigengelt

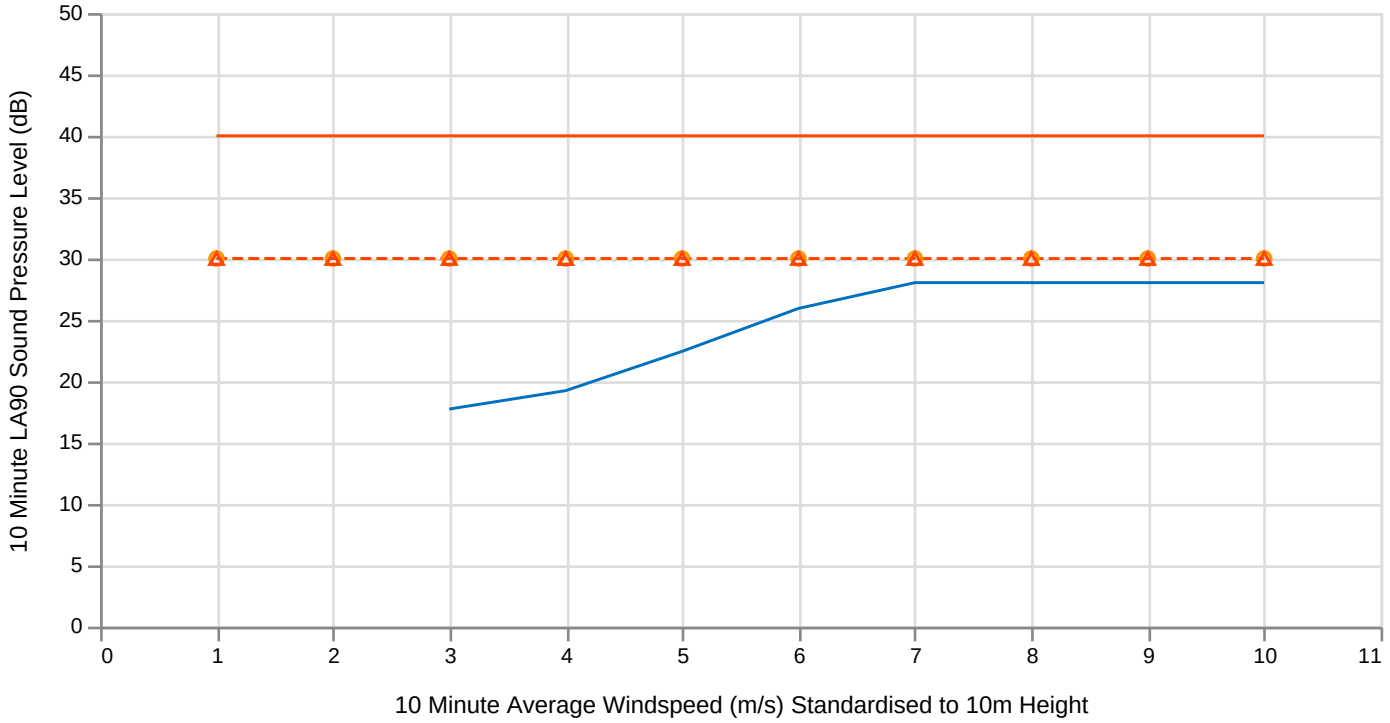


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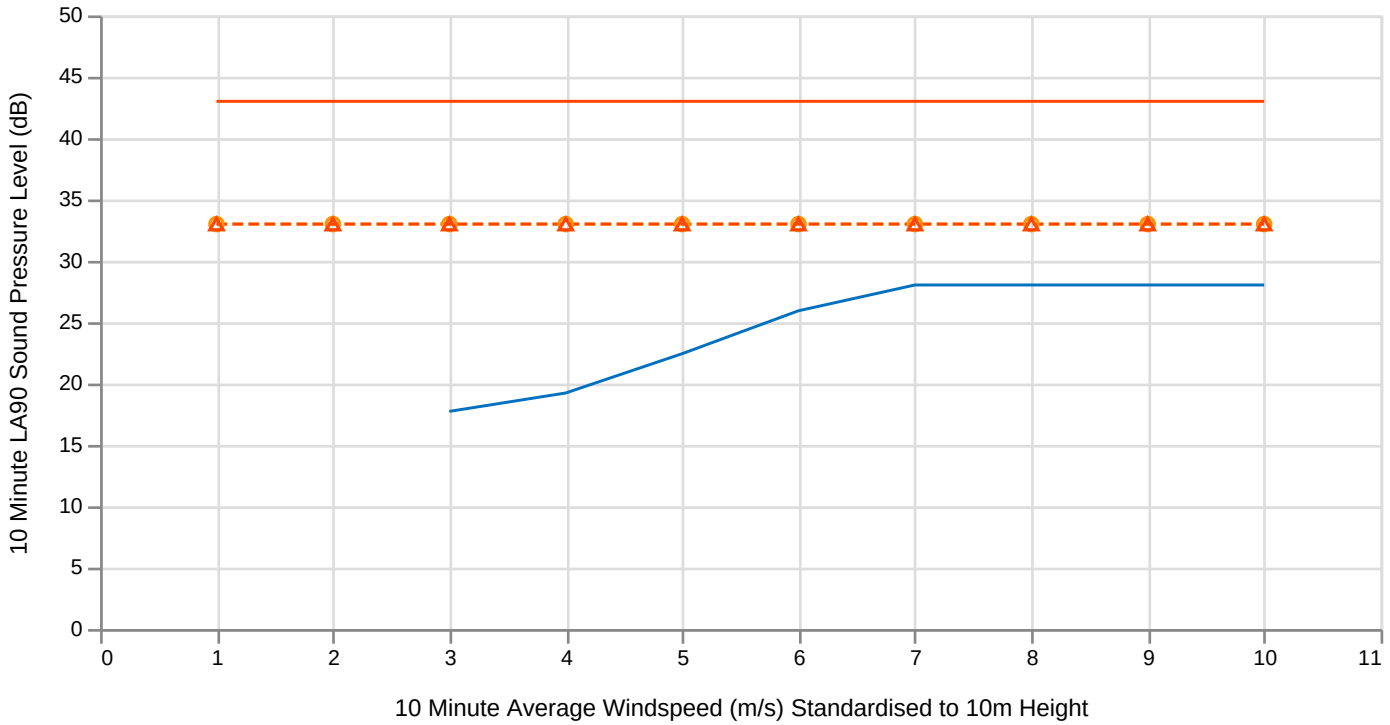
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL10 - Earlsburn Cottage



Night time - NAL10 - Earlsburn Cottage

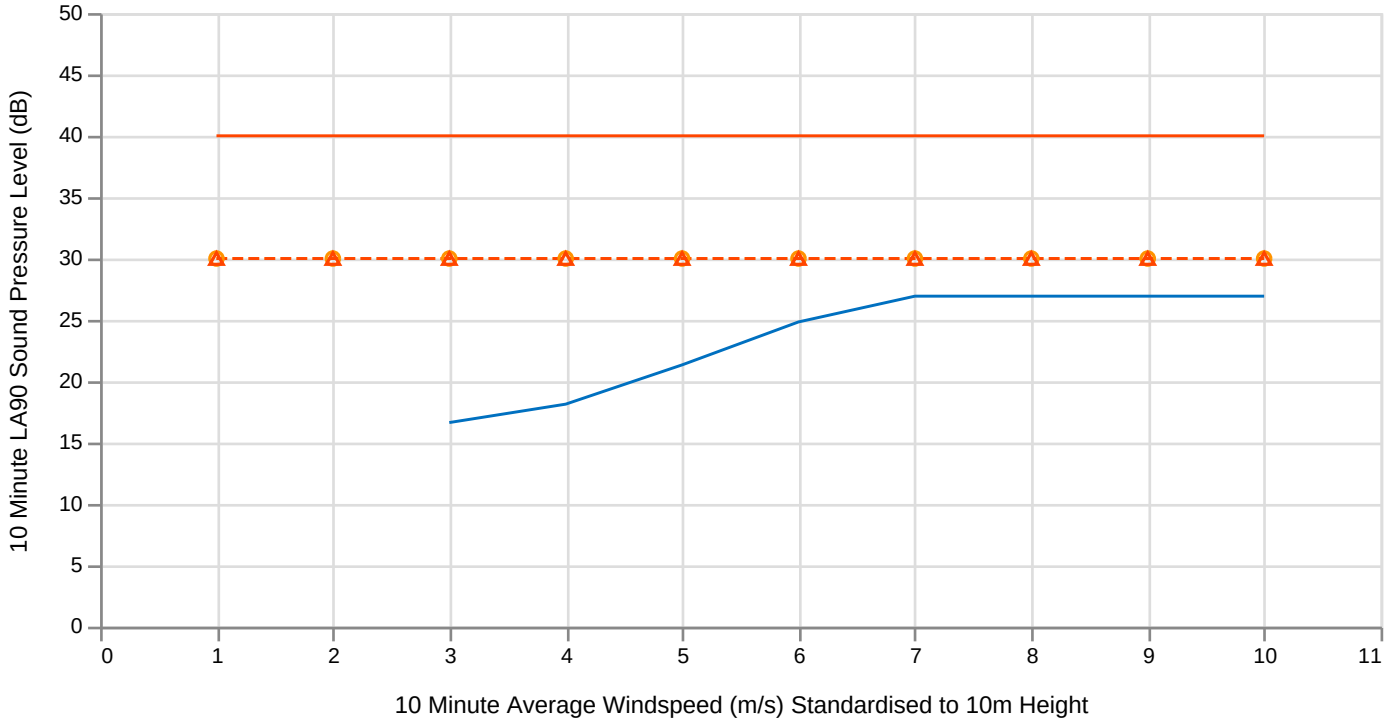


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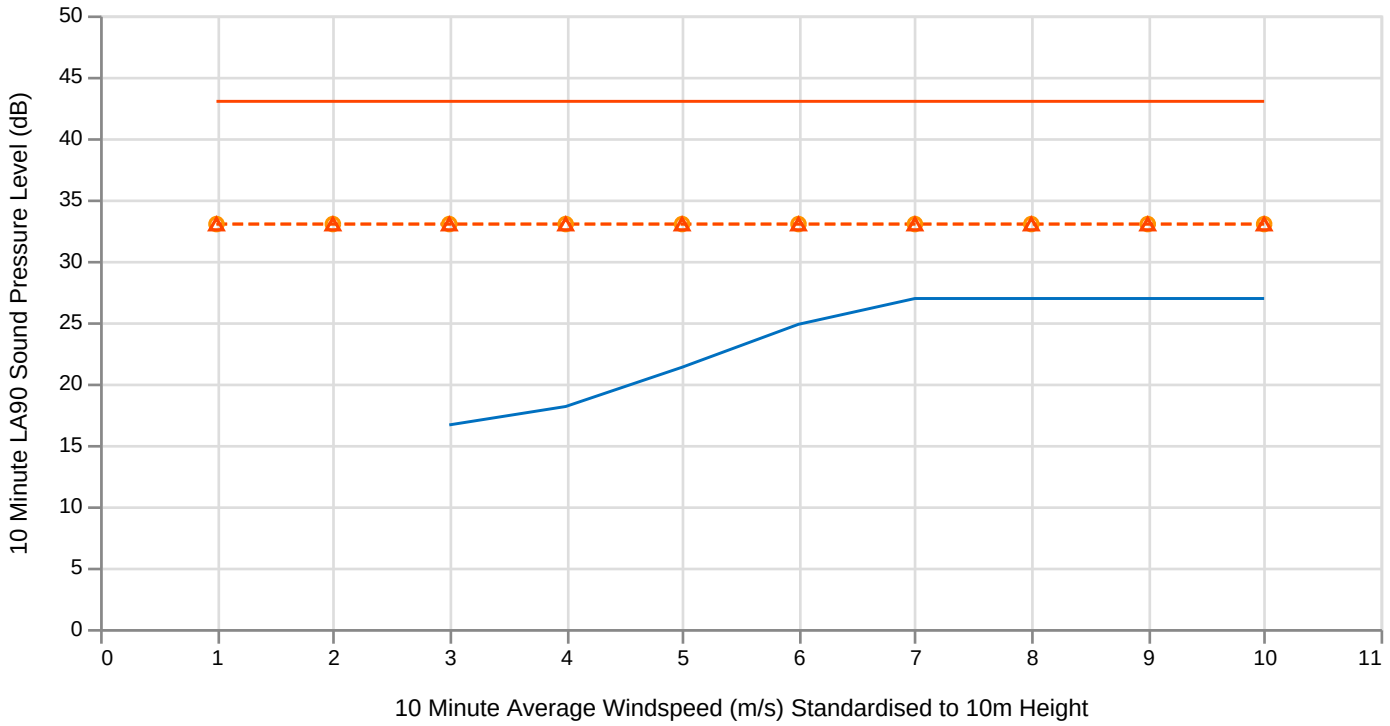
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL11 - Ryecroft



Night time - NAL11 - Ryecroft

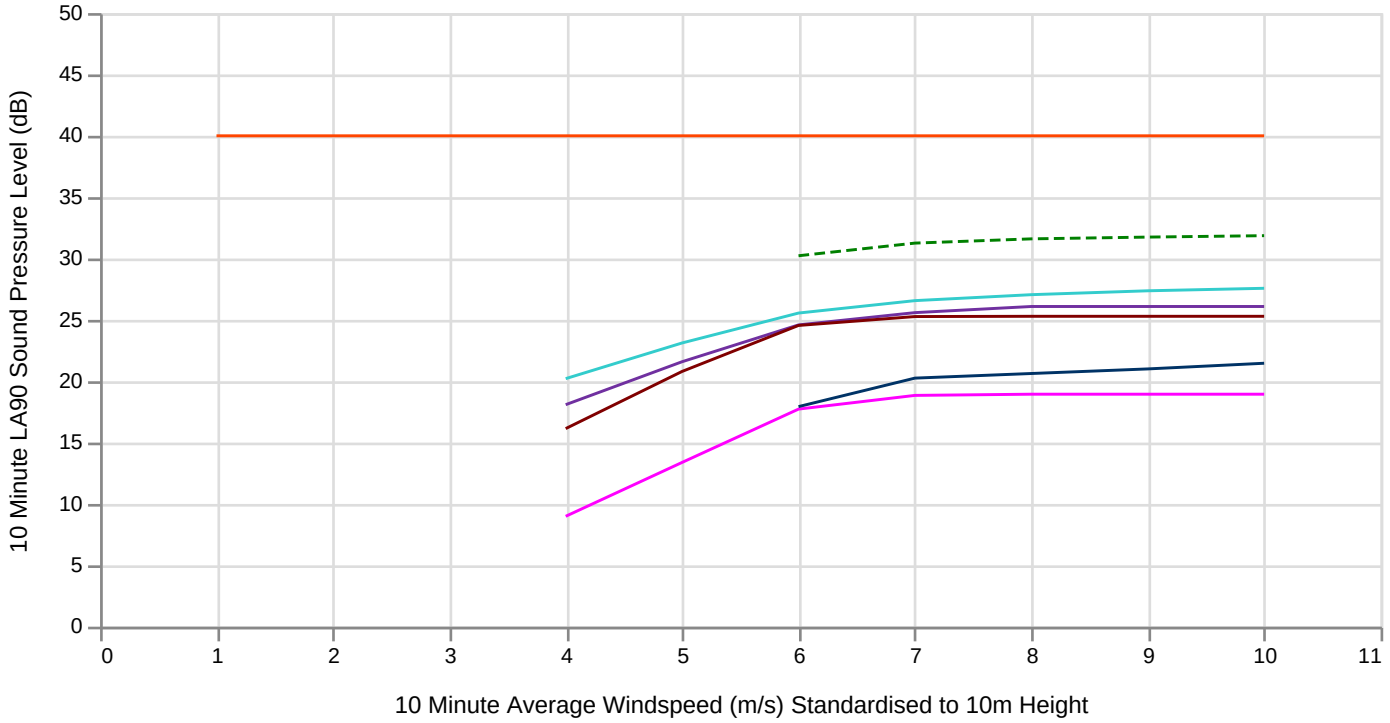


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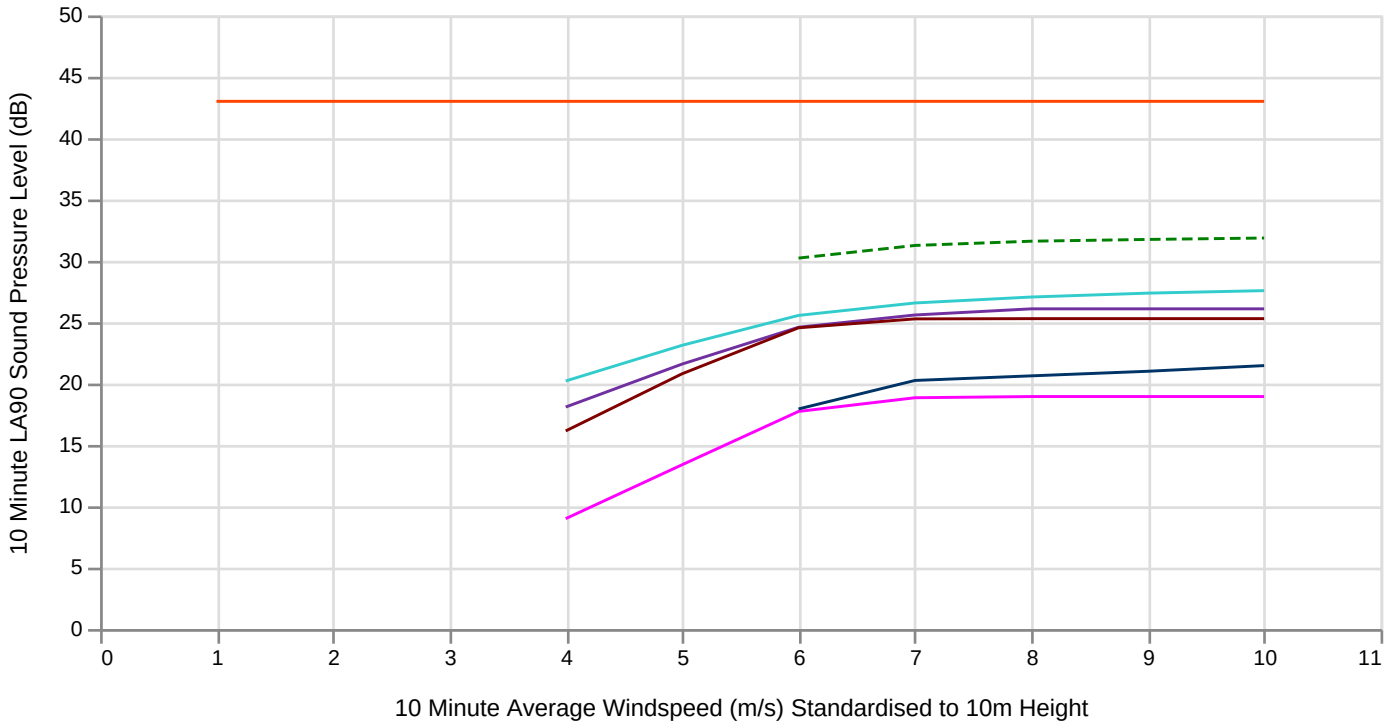
- Total Noise Assessement Criteria
- Proposed Development
- Residual Noise Limit
- Site Specific Noise Limit

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-28

Daytime - NAL3 - Cairnoch Farm, FI with Proposed Development



Night time - NAL3 - Cairnoch Farm, FI with Proposed Development

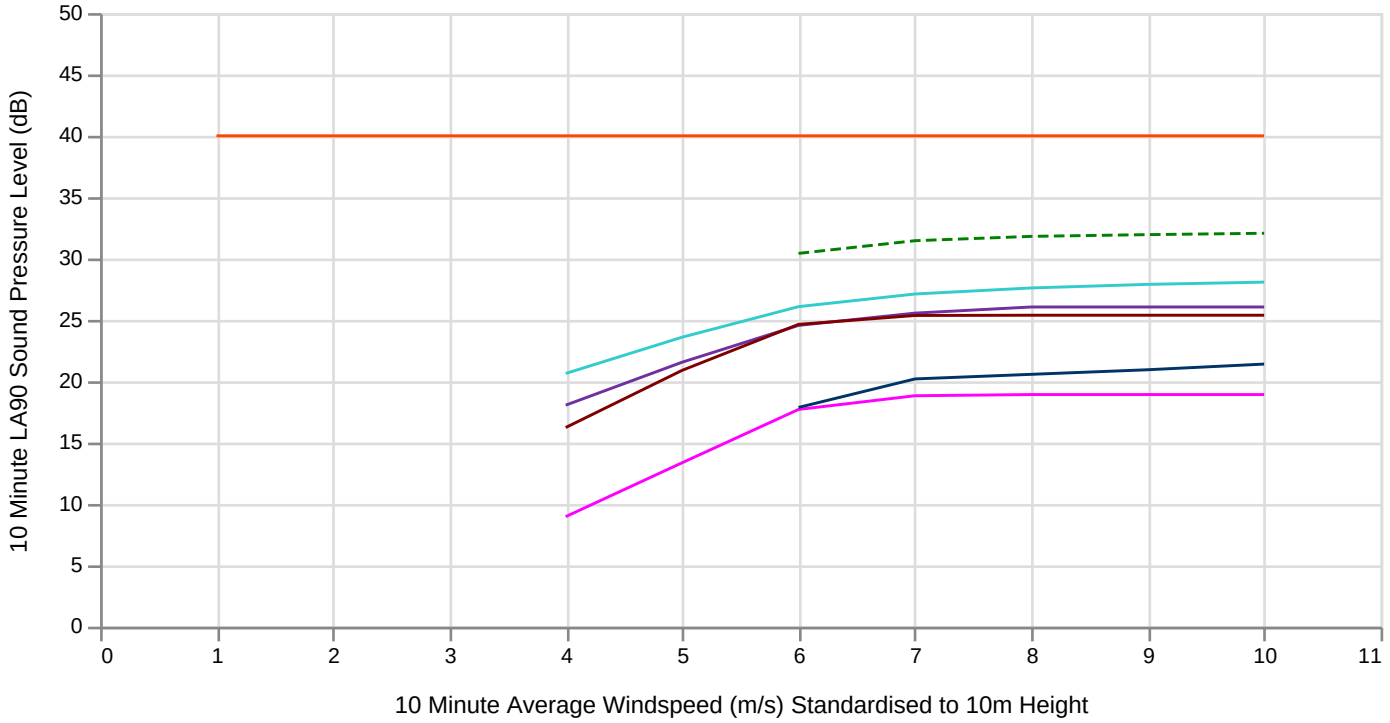


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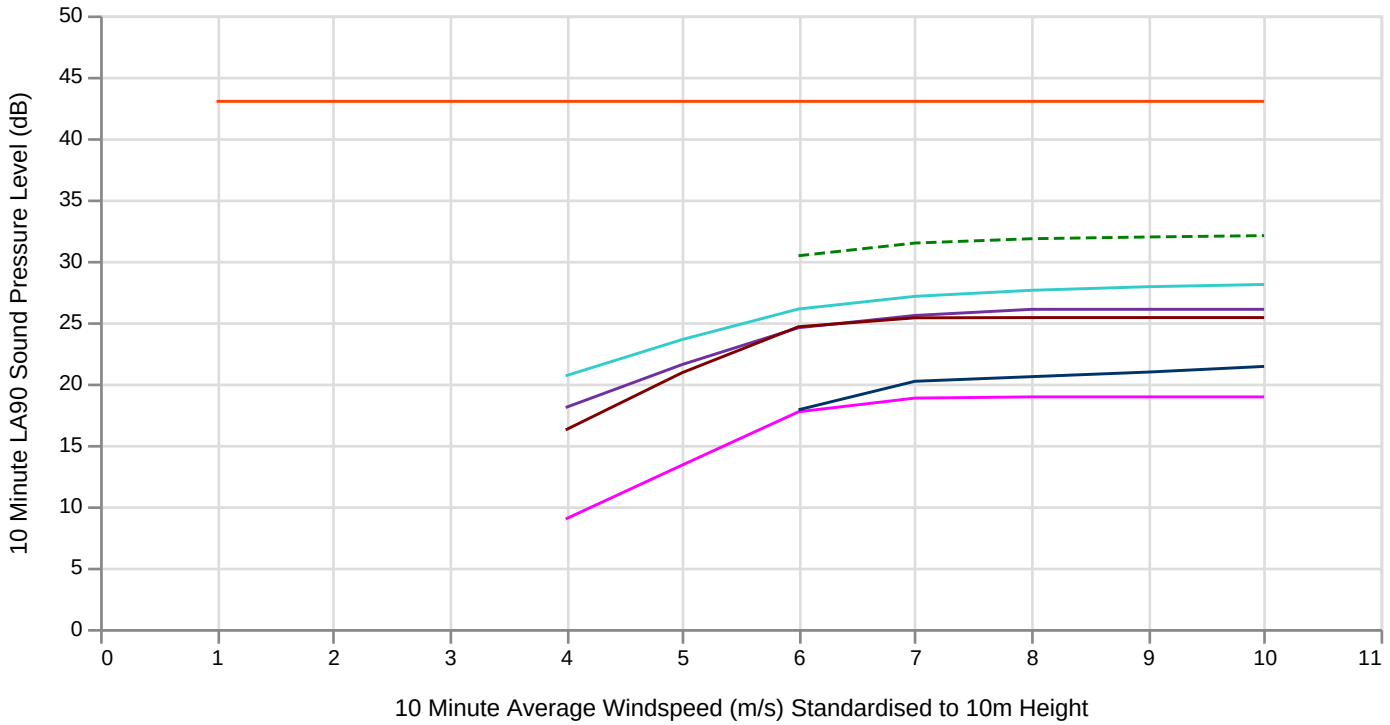
- Total Noise Assessement Criteria
- Cumulative (exc. the Prop. Dev.)
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-27

Daytime - NAL4 - Cairnoch Bothy, FI with Proposed Development



Night time - NAL4 - Cairnoch Bothy, FI with Proposed Development

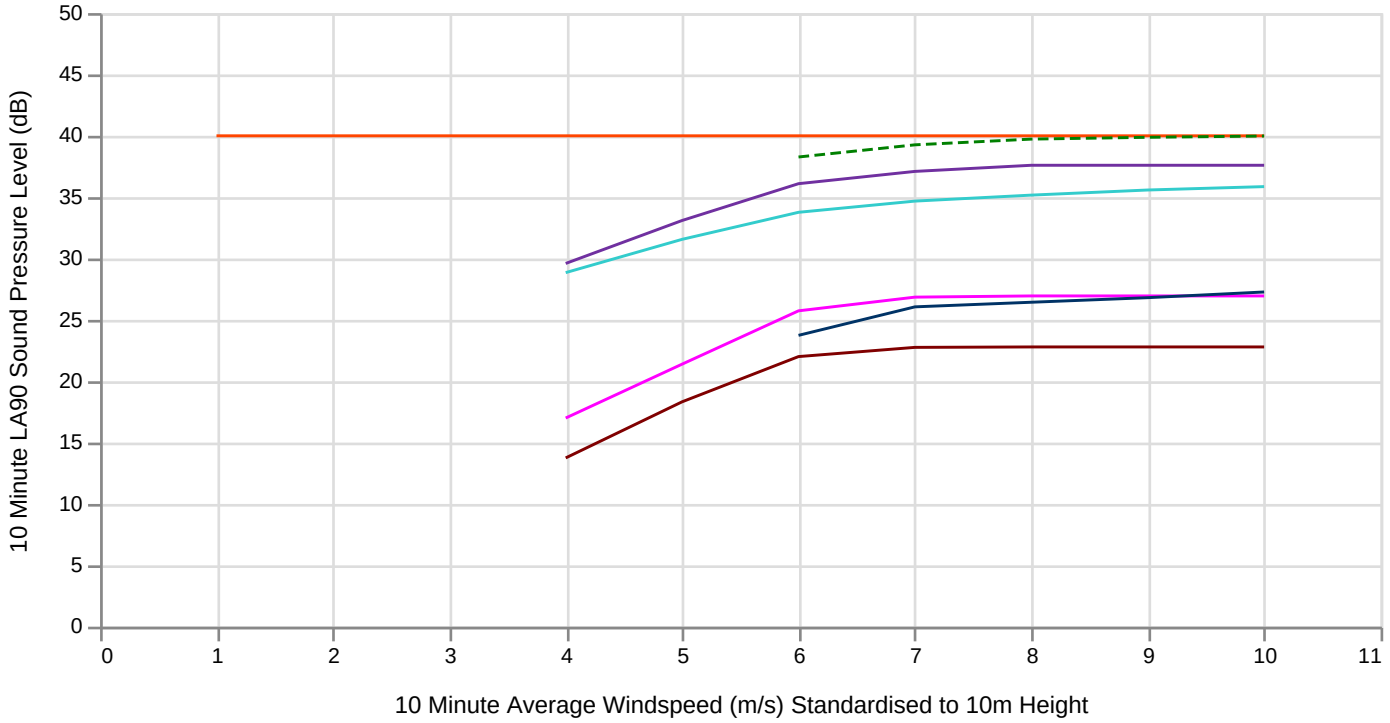


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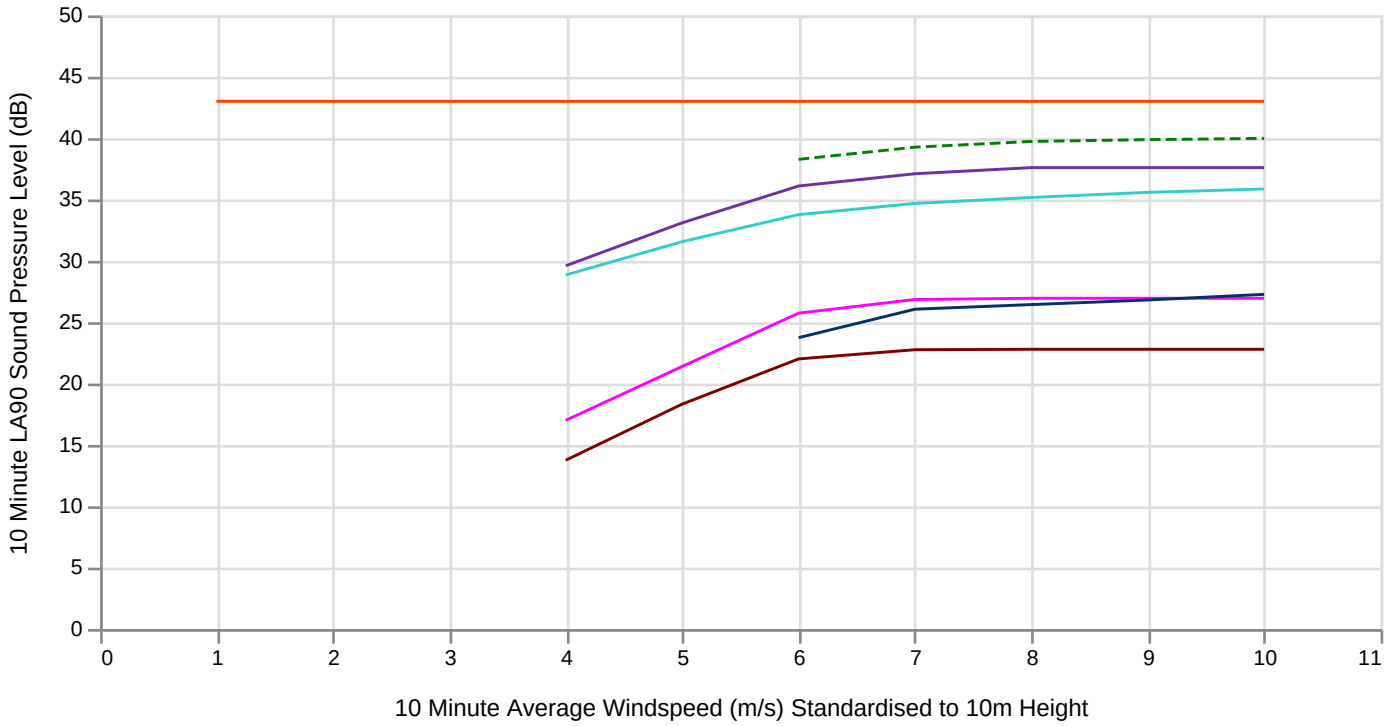
- Total Noise Assessement Criteria
- Cumulative (exc. the Prop. Dev.)
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-27

Daytime - NAL7 - Cairnoch Lodge, FI with Proposed Development



Night time - NAL7 - Cairnoch Lodge, FI with Proposed Development

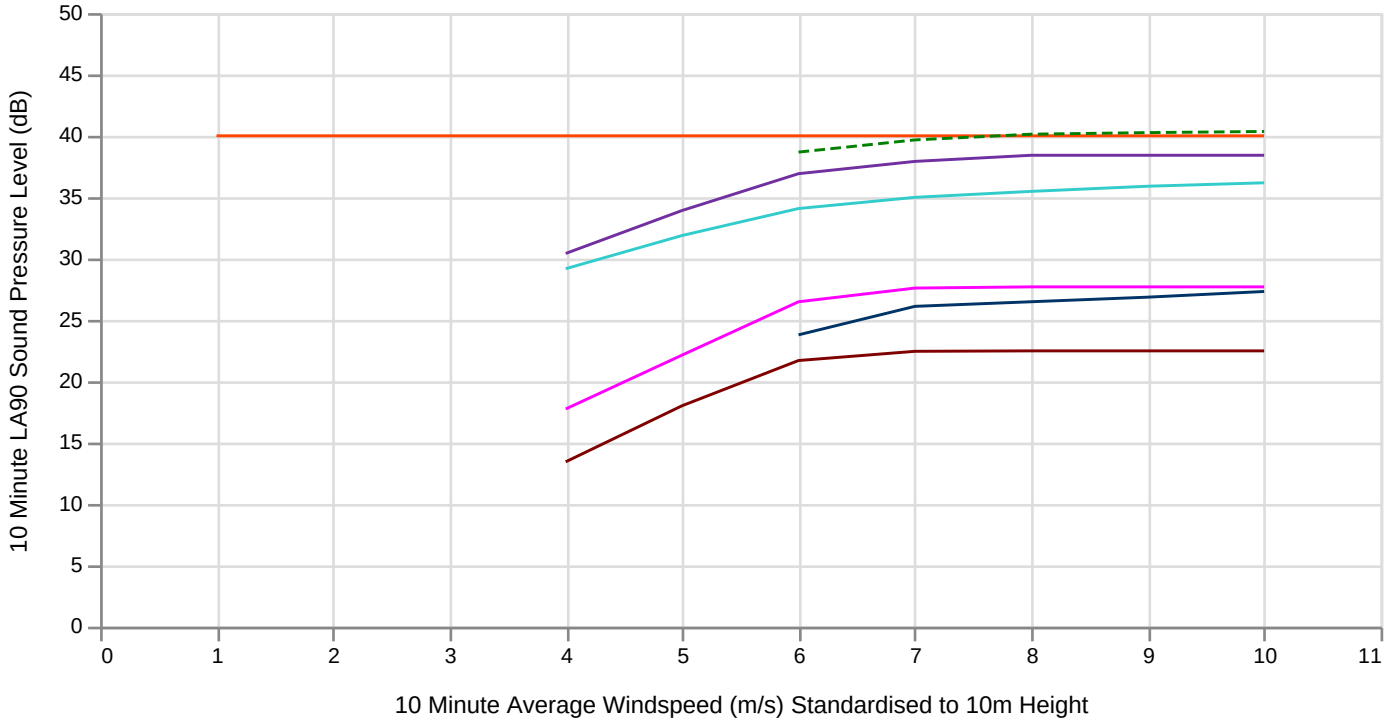


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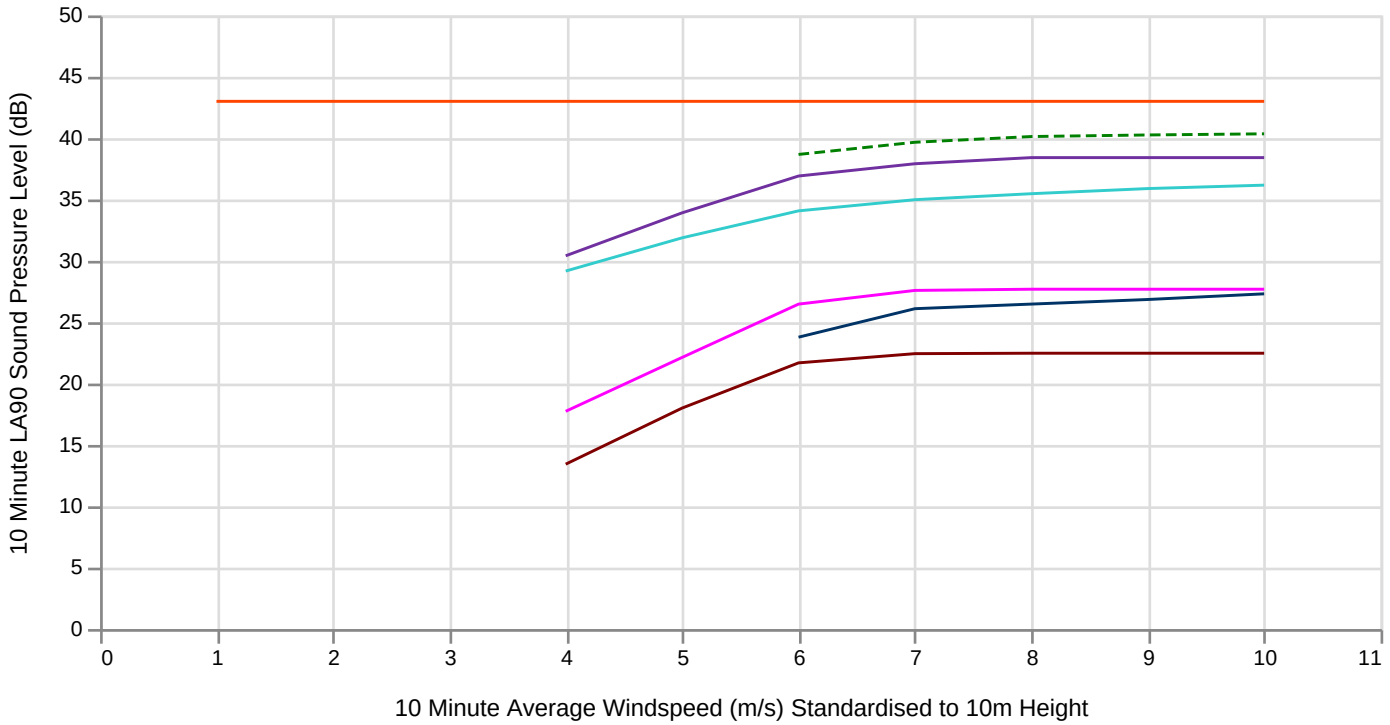
- Total Noise Assessement Criteria
- Cumulative (exc. the Prop. Dev.)
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-27

Daytime - NAL8 - Easter Cringate, FI with Proposed Development



Night time - NAL8 - Easter Cringate, FI with Proposed Development

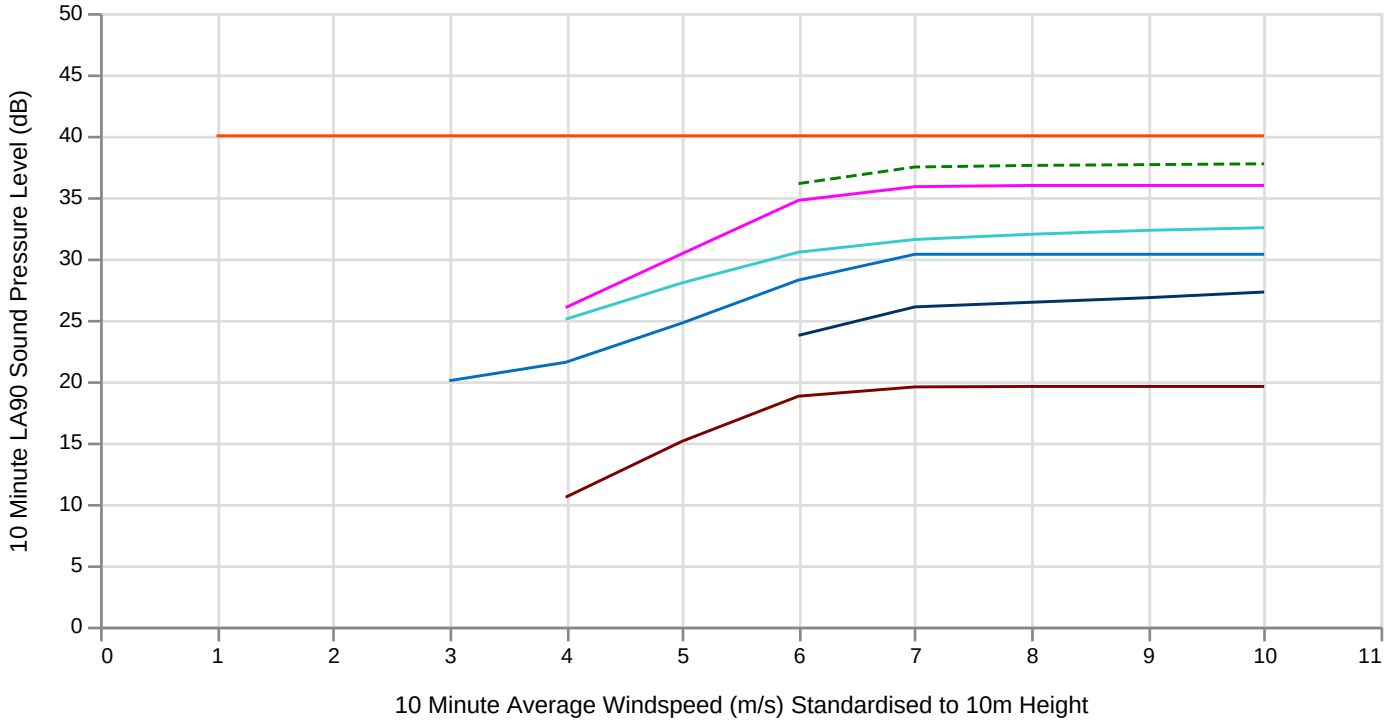


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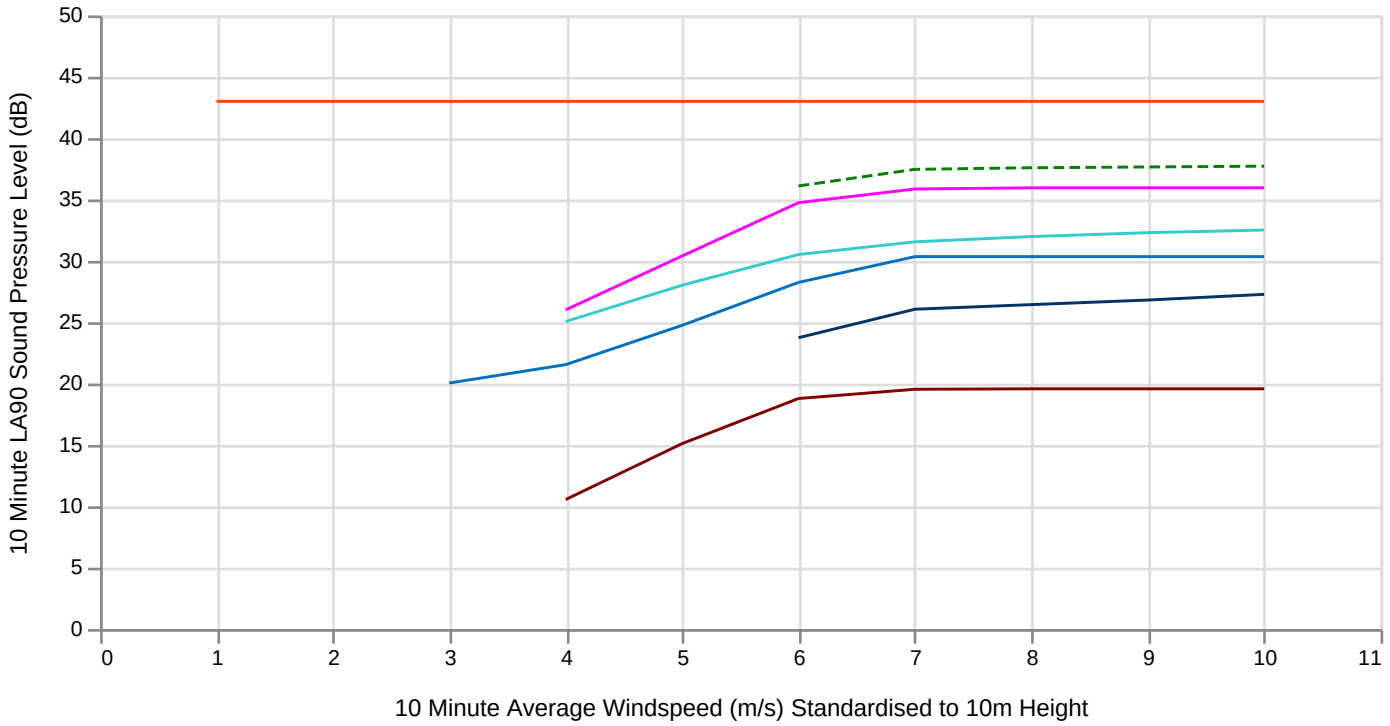
- Total Noise Assessement Criteria
- Cumulative (exc. the Prop. Dev.)
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-27

Daytime - NAL9 - Easter Cringate Cottage, FI with Craigengelt



Night time - NAL9 - Easter Cringate Cottage, FI with Craigengelt



Legend

- Total Noise Assessement Criteria
- Proposed Development
- Drummarnock Wind Farm
- Earlsburn (All) Wind Farms
- Shelloch Wind Farm
- Craigannet Farm
- Cumulative (exc. Craigengelt)

Client	Eurowind Energy
Project Name	Cairnoch Hill Wind Farm
Project Number	16646
Drawn By	TS
Checked By	GC
Date	2026-07-27

Annex 2 – Correspondence with the Environmental Health Department at the Council

24 March, 2025

Ref: 16646-001 R0

Environmental Health
Stirling Council

Dear Sir/ Madam,

PROPOSED CARRON VALLEY WIND FARM ON LAND AT CAIRNOCH HILL, 5 KM EAST OF FINTRY, STIRLING: NOISE ASSESSMENT

Eurowind Energy Limited ('hereinafter referred to as the Applicant') are proposing to develop Carron Valley Wind Farm ('the Proposed Development') on land at Cairnoch Hill, immediately to the north of Carron Valley Reservoir, and approximately 5 km to the east of Fintry. An indicative turbine layout is shown on the enclosed Figure 1 (Annex 1).

TNEI Services Ltd (TNEI) has been appointed by the Applicant to undertake the noise assessment for the Proposed Development, and we would like to agree the noise assessment methodology with you.

Operational Noise

An operational noise assessment will be undertaken in accordance with ETSU-R-97 *'The Assessment and Rating of Noise from Wind Farms'* (ETSU-R-97) and the Institute of Acoustics document *'A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise'* (IOA GPG).

ETSU-R-97 describes the findings of the Working Group on Noise from Wind Turbines, the aim of which was to provide information and advice to developers and planners on the environmental assessment of operational noise from wind turbines.

ETSU-R-97 recommends noise limits should be set at 5 dB above existing background noise levels, or a fixed minimum limit of 35-40 dB(A) L_{A90} during the daytime and 43 dB(A) L_{A90} during the night-time periods where background noise levels are low, and that these limits should reflect the variation in background noise with wind speed. Different limits apply to those properties that have a financial interest in the wind energy development (45 dB(A) L_{A90} or background plus 5 dB, whichever is the greater, for both daytime and night-time).

The choice of quiet daytime fixed minimum limits should be considered in light of the guidance contained within ETSU-R-97 and the IOA GPG. Extracts of the guidance contained within ETSU-R-97 and the IOA GPG are included in Annex 2. Noise limits established at properties in accordance with ETSU-R-97 shall be applicable to all existing / proposed (in planning) wind farms in the area and will henceforth be referred to as the 'Total ETSU-R-97 Noise Limits'. The Site-Specific Noise Limits will be the limits that the proposed development would have to operate within, should consent be granted.

Newcastle
7th Floor, West One
Forth Banks
Newcastle Upon Tyne
NE1 3PA
Tel: +44(0)191 211 1400
VAT Reg. GB 239 0146 20 | Company Reg. 03891836

Given the number of operational, and consented and proposed wind farms in the area, and the fact that a daytime Total ETSU-R-97 Noise Limit based on a fixed minimum limit of 40 dB has been used for Earlsburn Wind Farm(s) at shared receptors to the Proposed Development, the daytime Total ETSU-R-97 Noise Limits based on a fixed minimum limit of 40 dB will be derived for the Proposed Development. The Site Specific Noise Limits will be based on the lower daytime fixed minimum noise limit of 35 dB. The Total and Site Specific night-time noise limits will be based on 43 dB.

It is proposed that the Total ETSU-R-97 Noise Limits will not vary as a function of background noise levels and standardised hub height wind speed (i.e. limits which are set equal to the fixed minimum limits). The reason for this is two-fold; firstly there are a number of operational wind farms in the vicinity of the Proposed Development such that obtaining background noise measurements which are not contaminated by operational turbine noise difficult; and secondly, the historic background noise levels for nearby receptors, which have been most recently presented within the noise assessment for Earlsburn Wind Farm Extension (ref: ECU00004510), whilst representative, are referenced to a hub height of 100 m at a point located upon the Earlsburn site (noting that the Proposed Development has a hub height of 119 m and is located upon Cairnoch hill, to the south of the Earlsburn site). It is therefore not appropriate to derive Total ETSU-R-97 Noise Limits as a function of these background noise levels due to the difference in wind speed reference. It is noted that this approach (the use of limits which do not vary with wind speed) was also agreed for the nearby proposed Drummarnock Wind Farm (ref: 24/00494/FUL).

The Site Specific Noise Limits would be derived, taking account of the other wind farm developments in the area. The Site Specific Noise Limits will be derived using the principles contained within the IOA GPG, which will include determining the Remaining Noise Budget (RNB) available to the Proposed Development based on worst case cumulative noise predictions for all neighbouring operational, consented and proposed developments, subject to a cautious +2 dB buffer. The RNB approach will be utilised as it is noted that some neighbouring developments have maximum turbine sound power levels stated within their noise conditions, rather than Site Specific Noise Limits, with some developments also not having conditioned noise limits at all. This approach was also agreed and used for the proposed Drummarnock Wind Farm. The Site Specific Noise Limits will be the limits that the Proposed Development would have to operate within, should planning consent be granted.

Cumulative Noise Assessment

TNEI is aware of a number of operational, consented and proposed wind farm schemes in the area (see Figure 1 in Annex 1). We would be grateful if you could bring to our attention any other wind farm/ turbine developments that you are aware of in the area that may merit consideration within the cumulative noise assessment.

Summary

To enable us to progress the assessment we would be very grateful if you confirm:

- You agree with the use ETSU-R-97 Noise limits which do not vary as a function of background noise levels due to the differences in reference wind speeds from the historic background noise data to hub height wind speeds for the Proposed Development;
- You agree with the proposed approach that, in line with IOA GPG, the cumulative assessment and derivation of Site Specific Noise Limits for the Proposed Development will utilise available headroom through the Remaining Noise Budget approach, subject to a cautious +2 dB buffer; and

- If the Council is aware of any schemes which should be included in the cumulative noise assessment (other than those shown on Figure 1) which should be considered in the assessment of noise impacts.

If you have any immediate concerns or queries, please do not hesitate to contact me or my colleague James Mackay. We look forward to hearing from you soon.

Yours sincerely,

[redacted]

Alex Dell
MEng, PhD, MIOA

Senior Consultant

[redacted]

Reviewed and approved by:

[redacted]

James Mackay
BSc(Hons), Dip, MIOA

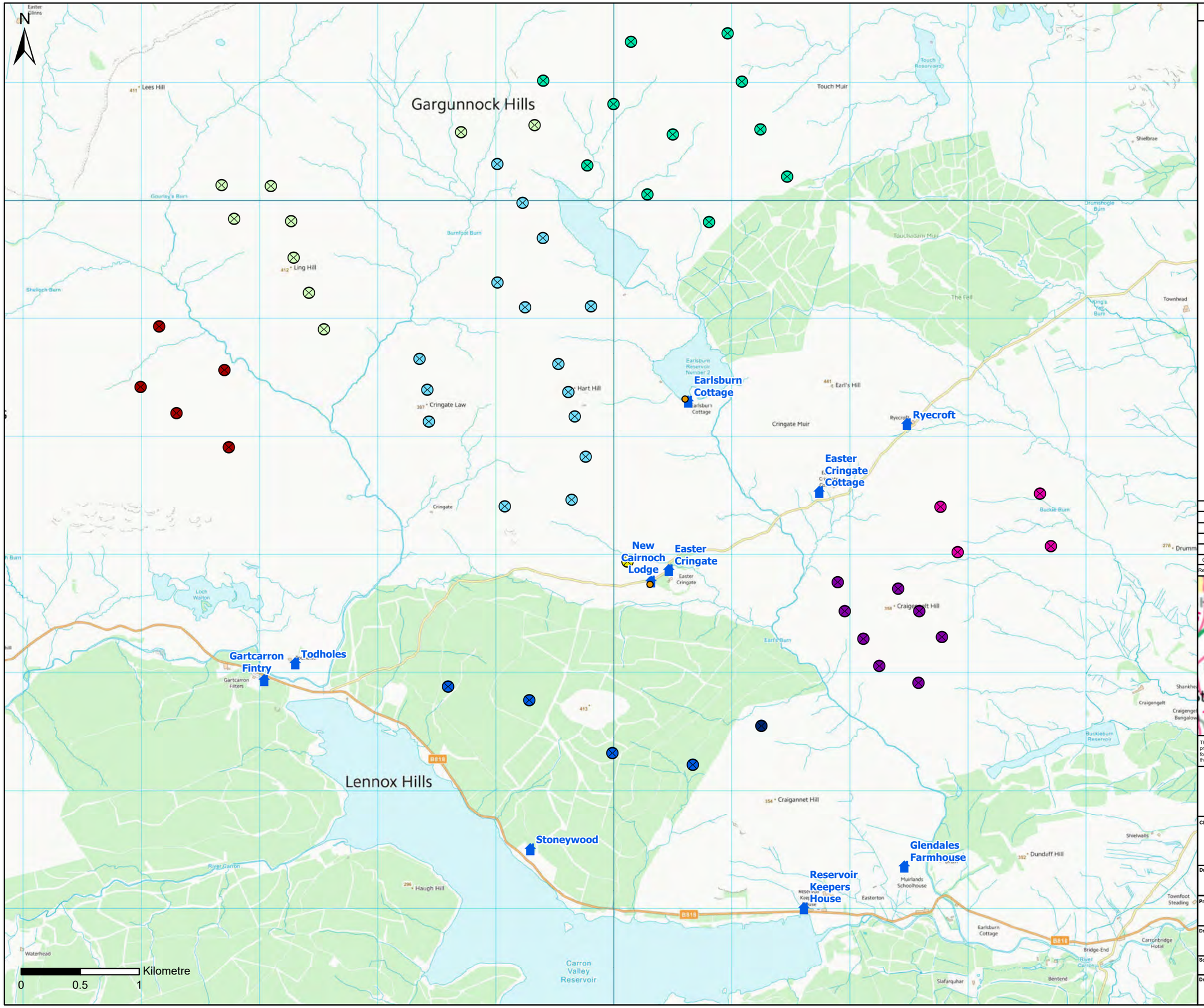
Director of Environment & Engineering

[redacted]

Annex 1 - Figure 1 – Noise Consultation Letter

Annex 2 - Determining the Fixed Part of the Daytime Amenity Noise Limit

Annex 1: Figure



LEGEND

- Earlsburn Wind Farm Noise Monitoring Locations
- Noise Assessment Locations (NALs)

Wind Farm

- Carron Valley Wind Farm (Indicative Layout)
- Craigannet Farm
- Craigengelt Wind Farm
- Drummarnock Wind Farm
- Earlsburn North Wind Farm
- Earlsburn Wind Farm
- Earlsburn Wind Farm Extension
- Easter Cringate
- Shelloch Wind Farm

Rev.	Date	Amendment Details	Drawn	Approved
0	18/03/2025	FOR INFORMATION	AD	JM



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Client: Eurowind Energy

Drawing Status: FOR INFORMATION

Project Title: CARRON VALLEY WIND FARM

Drawing Title: FIGURE 1 - NOISE CONSULTATION

Scale:	Original Size:	Spatial Reference:
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Annex 2: Determining the Fixed Part of the Daytime Amenity Noise Limit

In relation to determining the fixed part of the Daytime Amenity Noise Limit the ETSU-R-97 notes (on page 65) that:

"The actual value chosen for the daytime lower limit, within the range of 35-40 dB(A), should depend upon a number of factors:

• Number of dwellings in the neighbourhood of the wind farm.

The planning process is trying to balance the benefits arising out of the development of renewable energy sources against the local environmental impact. The more dwellings that are in the vicinity of a wind farm the tighter the limits should be as the total environmental impact will be greater. Conversely if only a few dwellings are affected, then the environmental impact is less and noise limits towards the upper end of the range may be appropriate. Developers still have to consider the interests of individuals as protected under the Environmental Protection Act 1990. It is our belief however, in accordance with the report of the Welsh Affairs Committee [23], that there have been no cases of complaints of noise at levels similar to those caused by wind farms leading to a successful prosecution as a statutory nuisance. It should be noted however that the Welsh Affairs Committee also reports that although the noise may not be a statutory nuisance it can clearly be a cause for distress and disturbance, particularly if residents have been promised inaudibility and the noise has a particular quality leading to complaints.

• The effect of noise limits on the number of kWh generated.

Similar arguments can be made when considering the effect of noise limits on uptake of wind energy generated. A single wind turbine causing noise levels of 40 dB(A) at several nearby residences would have less planning merit (noise considerations only) than 30 wind turbines also causing the same amount of noise at several nearby residences.

• Duration and level of exposure.

The proportion of the time at which background noise levels are low and how low the background noise level gets are both recognised as factors which could affect the setting of an appropriate lower limit. For example, a property which experienced background noise levels below 30 dB(A) for a substantial proportion of the time in which the turbines would be operating could be expected to receive tighter noise limits than a property at which the background noise levels soon increased to levels above 35 dB(A). This approach is difficult to formulate precisely and a degree of judgement should be exercised."

The IOA GPG adds some further guidance:

"3.2.2 The day amenity noise limits have been set in ETSU-R-97 on the basis of protecting the amenity of residents whilst outside their dwellings in garden areas. The daytime amenity noise limits are formed in two parts: Part 1 is a simple relationship between the prevailing background noise level (with wind speed) with an allowance of +5 dB; Part 2 is a fixed limit during periods of quiet. ETSU-R-97 describes three criteria to consider when determining the fixed part of the limit in the range of 35 dB to 40 dB L_{A90}, all of which should be considered. They are:

1) the number of noise-affected properties;

2) the potential impact on the power output of the wind farm; and

3) the likely duration and level of exposure.

3.2.3 The rationale for a choice of this limit, or factors which would assist the determining authority in this respect should be set out in the assessment. It is beneficial to the decision maker to display both sets of limits to illustrate the range available and/or the noise limit for the development if agreed previously with the LPA.

3.2.4 Current practice on the three criteria is as follows:

1. The number of neighbouring properties will depend on the nature of the area, (rural, semi-rural, urban) and is sometimes considered in relation to the size of the scheme and study area. The predicted 35 dB L_{A90} contour (at maximum noise output up to 12 m/s) can provide a guide to the dwellings to be considered in this respect.

2. This is in practice mainly based on the relative generating capacity of the development, as larger schemes have relatively more planning merit (for noise) according to the description in ETSU-R-97. In cases when the amenity fixed limit has little or no impact on the generating capacity (i.e. noise is not a significant design constraint) then a reduced limit may be applied.

3. This last test is more difficult to formulate. But ETSU-R-97 notes that the likely excess of turbine noise relative to background noise levels should be a relevant consideration. In rural areas, this will often be determined by the sheltering of the property relative to the wind farm site. Account can also be taken of the effects of wind directions (including prevailing ones at the site) and likely directional effects. For cumulative developments, in some cases the effective duration of exposure may increase because of cumulative effects.

3.2.5 It can be argued that assessing these factors do not represent an acoustic consideration but ultimately a planning consideration, and therefore are difficult for noise consultants to fully determine. However this is described as part of ETSU-R-97 and therefore represents a relevant consideration when determining applicable noise limits. Furthermore, it is necessary, as part of the EIA process to evaluate the noise impacts, which is arguably not fully possible without a complete determination of the ETSU-R-97 limits. Finally, consideration of cumulative noise impacts may require the determination of partial noise limits which may be difficult to obtain unless the amenity noise limit is precisely determined.

3.2.6 Other planning considerations, such as the identification in local planning policy of areas of preferred wind farm development, may also influence or determine the choice of the absolute fixed amenity noise limit."

Annex 3 – Earlsburn Extension Baseline Extracts

- *The assessment needs to demonstrate that the development applied for will not exceed the relevant impact limits (i) as a discrete entity, and (ii) in combination with all other relevant cumulative sites. The treatment of the proposal site as a discrete entity allows for the possibility that, even if the site may initially be operated as an extension to existing sites, the site ownership could change in the future, and the planning consents in place need to allow for this possibility.* The basis of the application is for the Proposed Development to represent an additional extension of the operational Earlsburn Wind Farm. Therefore, the noise limits applied to the Earlsburn Wind Farm can apply to the total noise of all turbines: this is also the approach used in the consent for the Earlsburn North Wind Farm (now Kingsburn Wind Farm).
- *The cumulative assessment needs to take account of the relevant planning consents and conditions in place on the cumulative sites in accordance with the IOA GPG guidance.* This is considered in detail in Annex B.
- *The principle that receptors situated in between the Earlsburn Wind Farm on one side and the Craigengelt Wind Farms on the other would be unlikely to be simultaneously downwind of both sides is accepted. However, it should not be assumed from this that there would be no cumulative impact to consider from the Craigengelt Wind Farms. When the prevailing south-westerly winds are present, the receptors will largely be crosswind of both sites, and in such crosswind conditions, the sound immissions from each side could result in a cumulative impact. The assessment needs to demonstrate that cumulative impact has been assessed and, where necessary, mitigated.* Although this was not the basis for the consent of previous schemes in the area, a detailed directional analysis is set out as requested in Annex E and summarised in Section 5.6 below.
- *Where other proposed but yet to be consented cumulative developments are identified, the cumulative assessment method should include due consideration to limit apportionment between those developments and the Proposed Development.* This is not the case for the cumulative schemes considered and there is therefore no need to apportion the ETSU-R-97 limit considered below.

4. Baseline

4.1 General description

4.1.1 The Proposed Development is located in an area of relatively low population density adjacent to the east of the existing Earlsburn North and Earlsburn wind farms between the Touch Hills and Gargunnock Hills, approximately 6.2 km west of Stirling. The noise environment in the surrounding area is likely to be characterised by 'natural' sources such as wind disturbed vegetation and nearby wind turbine noise. Due to the close proximity of existing turbines in the area, undertaking new background noise surveys would not be possible in practice due to the likely influence of operational turbines on the baseline noise environment. Therefore, reference was made to historical background noise measurement data where relevant for the current noise assessment.

4.2 Details of the historical background noise survey

4.2.1 Historical background noise measurement were undertaken in 2003 at two locations for the Earlsburn Wind Farm application, prior to the construction of the nearby operational wind farms, and described in detail in the Earlsburn North Wind Farm application[19]. These results were referenced as representative of the background noise environment for the nearest residences to the Proposed Development. These two locations are shown on the plan in Annex B and listed in Table 2. Separate historical measurements were also undertaken at the New Cairnoch Lodge property for the Craigengelt Wind Farm application[20], however the background noise levels from the Earlsburn Wind Farm

[19] Earlsburn North Wind Farm Environmental Assessment, RDC Scotland Ltd, Appendix 11.1: Noise Assessment
[20] Craigengelt Wind Farm Environmental Statement, Vol 2 B1, 12/12/2006

application survey at this property were lower, and were therefore used for this assessment, in line with the requirements of Stirling Council.

Table 2 – Historical Background Noise Monitoring Locations (approximate Easting / Northing) from the Earlsburn Wind Farm Application

No.	Property	Easting	Northing
1	Earlsburn Cottage	270603	688318
2	New Cairnoch Lodge	270306	686748

4.2.2 The assessment has considered predicted operational noise from the Proposed Development together with the Earlsburn North and Earlsburn Wind Farms, at the historical measurement locations noted above, as well as other residential locations: all of these assessment locations are listed in Table 3. The list of receptor locations is not intended to be exhaustive but sufficient to be representative of noise levels typical of those receptors closest to the Proposed Development and such that total noise from the three relevant wind farms are above or close to the L_{A90} 35 dB threshold. Additional dwellings are also considered separately in Section 5.1 for the construction noise assessment and in Section 5.6 below in the context of the cumulative noise assessment.

4.2.3 The historical data obtained from the New Cairnoch Lodge position have additionally been used to represent the background noise environment expected to occur at the neighbouring Easter Cringate assessment location. The use of the data in this way is justified by the likely increased presence of stream noise at the latter property. This approach is consistent with the guidance provided by ETSU-R-97 and current good practice as set out in the IOA GPG. Locations where such representations have been made, and the source of the representations, are represented in Table 3.

Table 3 - Assessment locations in the vicinity of the Proposed Development

Property	Easting	Northing	Approximate distance to closest Proposed Development turbine (m)	Closest Turbine (ID)	Historical representative background survey location
New Cairnoch Lodge	270306	686748	3100	T10	New Cairnoch Lodge
Earlsburn Cottage	270603	688318	1500	T10	Earlsburn Cottage
Easter Cringate	270493	686893	2900	T10	New Cairnoch Lodge

4.3 Historical Background Noise Levels

4.3.1 The ETSU-R-97 assessment method requires noise data to be related to wind speed data at a standardised height of ten metres, with wind speeds either directly measured at a height of ten metres, as in the case of the Earlsburn Wind Farm historical background noise data, or by calculation from measurement at other heights. The appropriate choice should be determined by practitioner judgement and the available data sources. Since the publication of ETSU-R-97, the change in wind speed with increasing height above ground level has been identified as a potential source of variability when carrying out wind farm noise assessments, with additional guidance set out in the IOA GPG.

4.3.2 In this case, the effect of site-specific wind shear can be appropriately addressed by correcting the historical data referenced against ten metre heights using wind measurements made at taller heights. The results of the historical baseline measurements at the locations of Table 2 are represented in Figures C1 to C4 of Annex C. In each case, the derived best-fit lines to the historical background noise measurements referenced against a measured 10 m wind speed were corrected using the wind shear corrections detailed in Annex D, determined from long-term measurements at a temporary met mast

previously installed on the Earlsburn North site. The shear-corrected background noise best fit curves and noise limit curves are also shown in Figures C1 to C4 of Annex C.

4.3.3 This method is consistent with the preferred method described in the IOA GPG Supplementary Guidance Note 4: Wind Shear. Long term historical wind speed data was measured on a 70 metre tall meteorological mast located within the boundary of the nearby Earlsburn North Wind Farm site (approximate easting 266776 and northing 689845). Values of wind speed at a standardised height of ten metres were calculated from those measured on the mast ("standardised wind speed"), following extrapolation of wind speeds up to a 100 m turbine hub height (representative of the Proposed Development) and compared to estimated 10 m height wind speeds. Full details of the shear correction calculation method are given in Annex D.

4.3.4 The corresponding shear-corrected ETSU-R-97 noise limits are summarised in Table 4 and Table 5. The noise limits have been set either at the shear-corrected historical background level plus 5 dB, or at the relevant fixed lower limit, whichever is the greater. The relevant fixed lower limit value used for day-time periods is 40 dB(A), consistent with consents for both Earlsburn and Earlsburn North wind farms. The relevant fixed lower limit value used for night-time periods for the three receptors is 43 dB(A). The assessment has not assumed that any of these three properties are financially involved, on a precautionary basis. The Proposed Development (which is an extension) would operate in combination with the Earlsburn and Earlsburn North wind farms so that operational noise from the combination would remain within the noise limits at the assessment locations identified.

Table 4 - Day time L_{A90} noise limits derived from the baseline noise survey according to ETSU-R-97, for the Earlsburn Wind Farm, Esrlsburn North Wind Farm and Proposed Development.

Assessment Property	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
New Cairnoch Lodge	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	41.1	43.0	45.0
Earlsburn Cottage	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.8	43.0	45.2	47.4
Easter Cringate	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	41.1	43.0	45.0

Table 5 - Night time L_{A90} noise limits derived from the baseline noise survey according to ETSU-R-97, for the Earlsburn Wind Farm, Esrlsburn North Wind Farm and Proposed Development.

Assessment Property	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
New Cairnoch Lodge	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	44.4
Earlsburn Cottage	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.0	47.4
Easter Cringate	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	44.4

5. Noise Impact Assessment

5.1 Predicted Construction Noise Levels

5.1.1 The level of construction noise that occurs at the surrounding locations will be highly dependent on a number of factors such as the final site programme, equipment types used for each process, and the operating conditions that prevail during construction. It is not practically feasible to specify each and every element of the factors that may affect noise levels, therefore it is necessary to make reasonable allowance for the level of noise emissions that may be associated with key phases of the construction.

Annex C – Original and wind shear corrected historical background measurements

Figure C1 - Chart of historical background noise levels against wind speeds, the best fit curve to the data and shear corrected best fit curve, the historical and shear corrected derived noise limit curve for Earlsburn Cottage during day-time periods. Predicted immission noise levels are also shown for the Proposed Development, the other windfarms considered and the cumulative total of the relevant sites to which the noise limit is set (Earlsburn and Earlsburn North Wind Farms and Proposed Development).

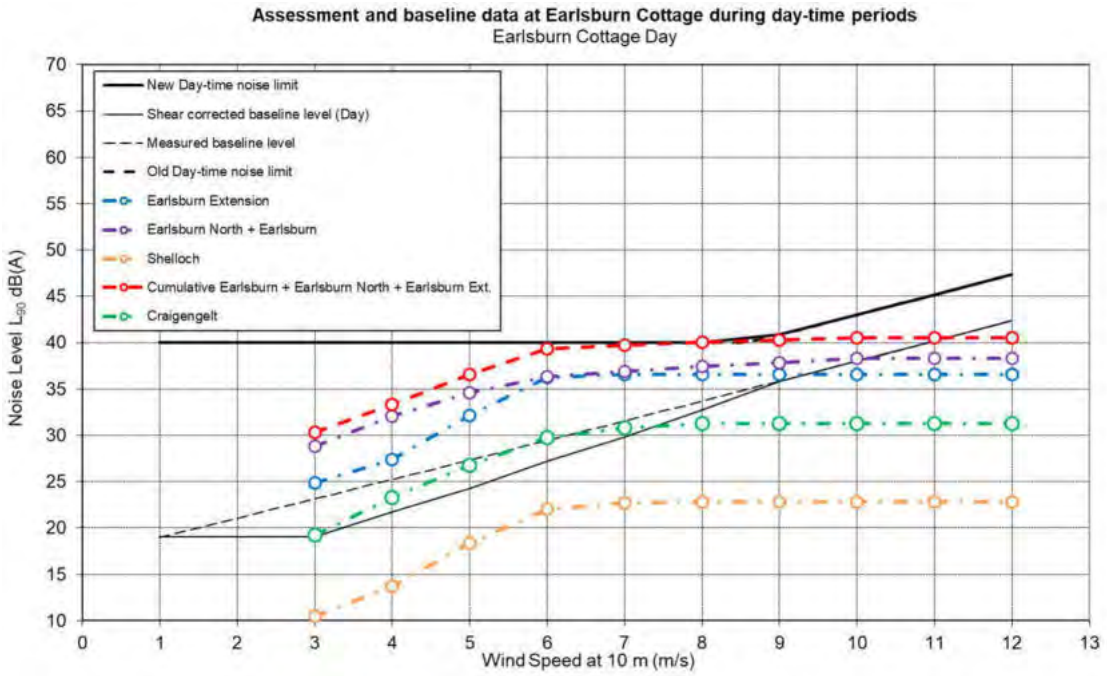


Figure C2 - Chart of historical background noise levels against wind speeds, the best fit curve to the data and shear corrected best fit curve, the historical and shear corrected derived noise limit curve for Earlsburn Cottage during night-time periods. Predicted immission noise levels are also shown for the Proposed Development, the other windfarms considered and the cumulative total of the relevant sites to which the noise limit is set (Earlsburn and Earlsburn North Wind Farms and Proposed Development).

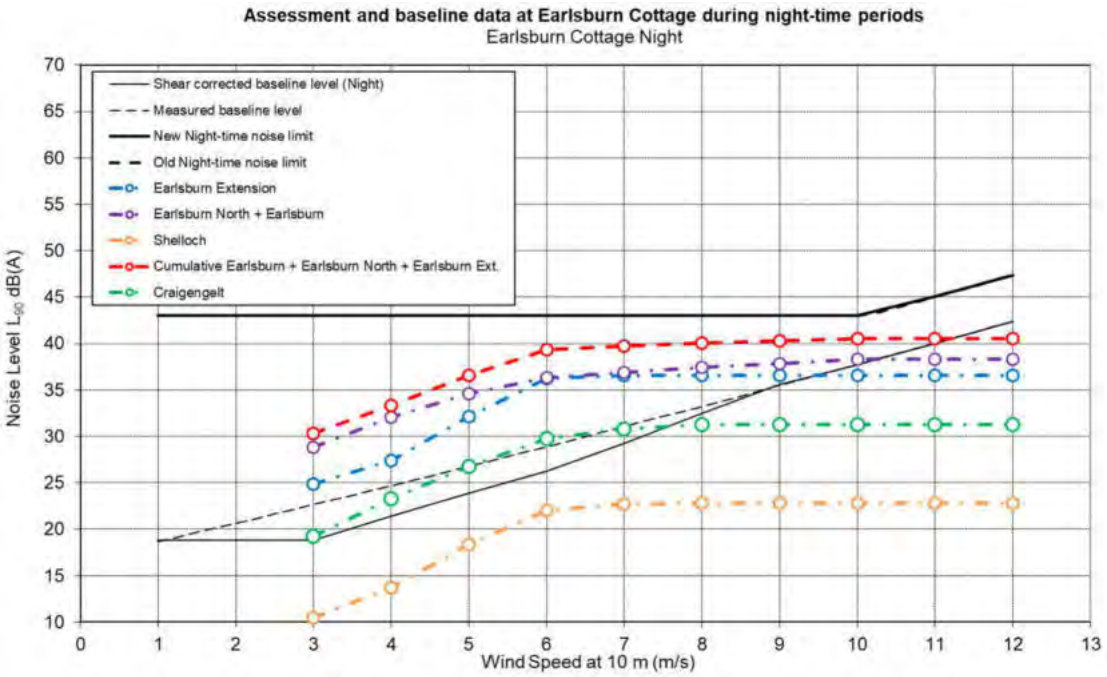


Figure C3 - Chart of historical background noise levels against wind speeds, the best fit curve to the data and shear corrected best fit curve, the historical and shear corrected derived noise limit curve for Easter Cringate during day-time periods. Predicted immission noise levels are also shown for the Proposed Development, the other windfarms considered and the cumulative total of the relevant sites to which the noise limit is set.

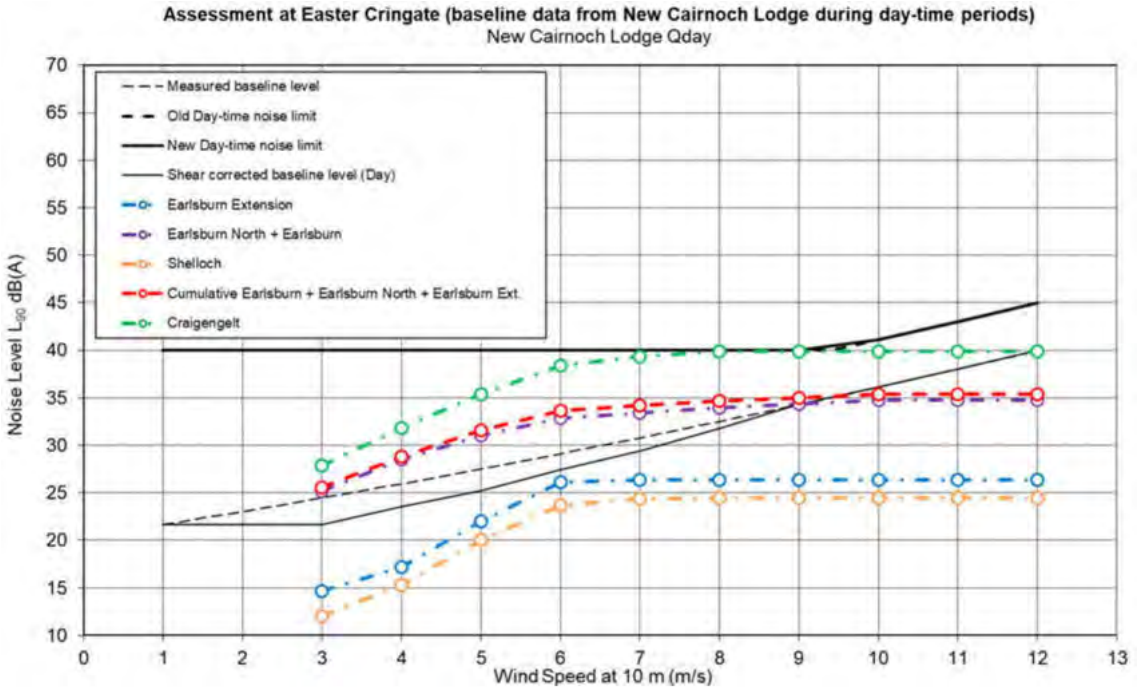
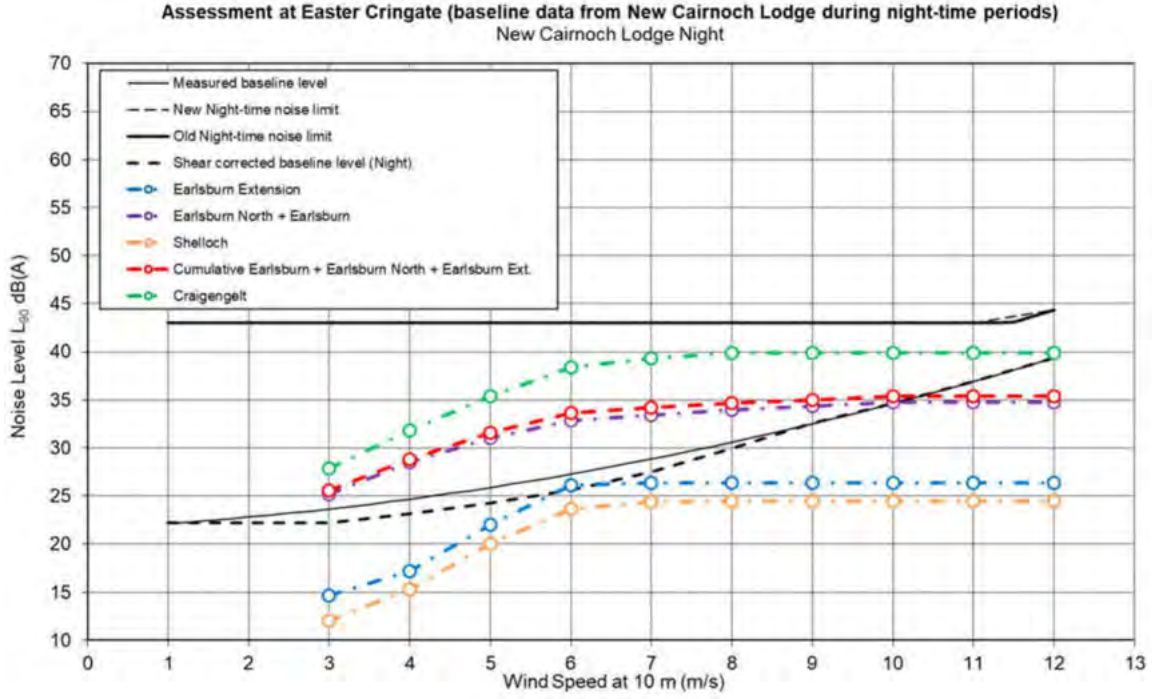


Figure C4 - Chart of historical background noise levels against wind speeds, the best fit curve to the data and shear corrected best fit curve, the historical and shear corrected derived noise limit curve for Easter Cringate during night-time periods. Predicted immission noise levels are also shown for the Proposed Development, the other windfarms considered and the cumulative total of the relevant sites to which the noise limit is set (Earlsburn and Earlsburn North Wind Farms and Proposed Development).



Annex 4 – Topographical Corrections/ Turbine Coordinates/ Cumulative Noise Predictions

Table 4.1: Topographical (concave ground/ barrier) Noise Prediction Adjustment Table

Notes/Comments

Requirement to include a concave ground profile correction of +3dB has been calculated in accordance with section 4.3.9 of the IOA GPG (2013).

A barrier correction of -2dB is included where the landform completely obscures a turbine at the noise assessment location.

Where analysis indicates that both are required the barrier correction take precedence and a correction of -2dB is applied.

Wind Farm	Hub	T ID	Noise Senstive Receptor										
			1	2	3	4	5	6	7	8	9	10	11
Craigengelt Wind Farm	80.0	1	0	-2	-2	-2	-2	-2	3	3	0	-2	-2
Craigengelt Wind Farm	80.0	2	0	-2	-2	-2	-2	-2	3	3	0	-2	-2
Craigengelt Wind Farm	80.0	3	0	-2	-2	-2	-2	-2	3	3	0	-2	0
Craigengelt Wind Farm	80.0	4	0	-2	-2	-2	-2	-2	3	3	0	-2	0
Craigengelt Wind Farm	80.0	5	3	0	-2	-2	-2	-2	3	3	0	-2	-2
Craigengelt Wind Farm	80.0	6	0	-2	-2	-2	-2	-2	3	3	0	-2	0
Craigengelt Wind Farm	80.0	7	0	-2	-2	-2	-2	-2	3	3	0	-2	0
Craigengelt Wind Farm	80.0	8	3	0	-2	-2	-2	-2	3	3	0	-2	-2
Drummarnock Wind Farm	98.5	9	0	-2	-2	-2	0	-2	0	0	0	0	0
Drummarnock Wind Farm	98.5	10	0	-2	-2	-2	-2	-2	0	0	0	-2	0
Drummarnock Wind Farm	98.5	11	0	-2	-2	-2	-2	-2	0	0	0	0	0
Drummarnock Wind Farm	98.5	12	0	-2	-2	-2	-2	-2	0	0	0	-2	0
Earlsburn Extension Wind Farm	76.5	13	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn Extension Wind Farm	76.5	14	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn Extension Wind Farm	82.0	15	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn Extension Wind Farm	76.5	16	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn Extension Wind Farm	82.0	17	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn Extension Wind Farm	76.5	18	-2	-2	-2	-2	0	0	-2	-2	-2	3	-2
Earlsburn Extension Wind Farm	82.0	19	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn North Wind Farm	70.0	20	-2	-2	-2	-2	3	3	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	21	-2	-2	-2	3	-2	3	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	22	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	23	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	24	-2	-2	3	3	-2	-2	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	25	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn North Wind Farm	70.0	26	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn North Wind Farm	70.0	27	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Earlsburn North Wind Farm	70.0	28	-2	-2	-2	3	-2	-2	-2	-2	-2	-2	-2
Earlsburn Wind Farm	70.0	29	-2	-2	-2	-2	3	3	-2	0	0	0	-2
Earlsburn Wind Farm	70.0	30	-2	-2	-2	-2	3	3	0	0	0	0	-2
Earlsburn Wind Farm	70.0	31	-2	-2	-2	-2	3	3	-2	0	0	0	-2
Earlsburn Wind Farm	70.0	32	-2	-2	-2	-2	3	3	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	33	-2	-2	-2	-2	3	3	-2	-2	-2	-2	-2
Earlsburn Wind Farm	70.0	34	-2	-2	-2	-2	3	3	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	35	-2	-2	-2	-2	3	3	-2	-2	-2	-2	-2
Earlsburn Wind Farm	70.0	36	-2	-2	-2	-2	3	3	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	37	-2	-2	-2	-2	0	0	-2	-2	-2	-2	-2
Earlsburn Wind Farm	70.0	38	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	39	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	40	-2	-2	-2	-2	0	0	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	41	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	42	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Earlsburn Wind Farm	70.0	43	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	-2
Shelloch Wind Farm	105.0	44	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2
Shelloch Wind Farm	105	45	-2	-2	0	0	-2	-2	-2	-2	-2	-2	-2
Shelloch Wind Farm	81.5	46	-2	-2	3	3	-2	-2	-2	-2	-2	-2	-2
Shelloch Wind Farm	81.5	47	-2	-2	3	3	0	0	-2	-2	-2	-2	-2
Shelloch Wind Farm	81.5	48	-2	-2	3	3	3	3	-2	-2	-2	-2	-2

Wind Farm	Hub	T ID	Noise Senstive Receptor										
			1	2	3	4	5	6	7	8	9	10	11
Craigannet Farm	58	49	-2	-2	-2	-2	-2	-2	0	0	3	-2	-2
Cairnoch Hill Wind Farm	99	51	-2	-2	0	0	0	0	0	0	0	0	0
Cairnoch Hill Wind Farm	99	52	-2	-2	0	0	3	0	0	0	3	0	3
Cairnoch Hill Wind Farm	99	53	0	0	0	0	0	0	0	0	3	0	3
Cairnoch Hill Wind Farm	99	54	0	0	0	0	0	0	0	0	0	-2	0

Table 4.2: Wind Farms/ Turbines Modelled

Wind Farm	Easting	Northing	Elevation	Hub Height Modelled	Tip Height Modelled	Turbine Modelled
Craigengelt Wind Farm	272113	686289	328	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	272249	686056	323	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	271956	686526	327	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	271896	686757	324	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	272582	685917	320	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	272405	686714	337	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	272584	686531	350	80.0	125.0	Nordex N90, 2.5 MW
Craigengelt Wind Farm	272780	686302	343	80.0	125.0	Nordex N90, 2.5 MW
Drummarnock Wind Farm	272767	687404	341	98.5	180.0	Nordex N163, 7 MW, with Serrated Blades
Drummarnock Wind Farm	273702	687071	287	98.5	180.0	Nordex N163, 7 MW, with Serrated Blades
Drummarnock Wind Farm	272913	687021	319	98.5	180.0	Nordex N163, 7 MW, with Serrated Blades
Drummarnock Wind Farm	273610	687517	282	98.5	180.0	Nordex N163, 7 MW, with Serrated Blades
Earlsburn Extension Wind Farm	269516	690365	394	76.5	135.0	Vestas V136, 4.0 MW, with Serrated Blades
Earlsburn Extension Wind Farm	270171	690622	415	76.5	135.0	Vestas V136, 4.0 MW, with Serrated Blades
Earlsburn Extension Wind Farm	269833	690190	380	82.0	149.9	Vestas V117, 4.2 MW, with Serrated Blades
Earlsburn Extension Wind Farm	270407	690375	412	76.5	135.0	Vestas V136, 4.0 MW, with Serrated Blades
Earlsburn Extension Wind Farm	270227	689920	381	82.0	149.9	Vestas V117, 4.2 MW, with Serrated Blades
Earlsburn Extension Wind Farm	270722	690130	416	76.5	135.0	Vestas V136, 4.0 MW, with Serrated Blades
Earlsburn Extension Wind Farm	270631	689683	385	82.0	149.9	Vestas V117, 4.2 MW, with Serrated Blades
Earlsburn North Wind Farm	267556	688909	374	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	267426	689220	397	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	267295	689517	406	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	267243	689819	407	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	266807	689861	384	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	268686	690584	405	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	269329	690637	405	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	267095	690125	420	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn North Wind Farm	266689	690132	384	70.0	115.0	Nordex N90/2500HS, 2.5 MW
Earlsburn Wind Farm	269095	687404	359	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269644	687461	406	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269763	687827	409	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269670	688209	422	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	268435	688125	382	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269615	688375	430	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	268421	688392	388	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269530	688614	415	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	268357	688656	361	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269251	689097	407	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269800	689077	410	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269014	689301	400	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269400	689681	400	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269229	689980	390	70.0	110.0	Nordex N80, 2.5 MW
Earlsburn Wind Farm	269029	690319	388	70.0	110.0	Nordex N80, 2.5 MW
Shelloch Wind Farm	266150	688934	315	105.0	180.0	Vestas V150, 6.0 MW, with Serrated Blades
Shelloch Wind Farm	266703	688563	296	105.0	180.0	Vestas V150, 6.0 MW, with Serrated Blades
Shelloch Wind Farm	265993	688419	386	81.5	149.5	Vestas V136, 4.0 MW, with Serrated Blades
Shelloch Wind Farm	266296	688198	398	81.5	149.5	Vestas V136, 4.0 MW, with Serrated Blades
Shelloch Wind Farm	266740	687910	405	81.5	149.5	Vestas V136, 4.0 MW, with Serrated Blades
Craigannet Farm	271250	685550	301	58.0	99.0	Vensys VE82, 1.5 MW
Cairnoch Hill Wind Farm	269183	686380	305	99.0	180.0	Vestas V162, 7.2MW, with Serrated Blades
Cairnoch Hill Wind Farm	269514	685957	368	99.0	180.0	Vestas V162, 7.2MW, with Serrated Blades
Cairnoch Hill Wind Farm	270220	685551	374	99.0	180.0	Vestas V162, 7.2MW, with Serrated Blades
Cairnoch Hill Wind Farm	270707	685384	306	99.0	180.0	Vestas V162, 7.2MW, with Serrated Blades

Table A4.3 - Likely Effects Calculations

Location		Wind Speed (ms^{-1}) as standardised to 10m height									
		1	2	3	4	5	6	7	8	9	10
NAL1 - Glendales Farmhouse	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	35.2	36.3	36.8	36.8	36.8
	Difference	-	-	-	-	-	-9.3	-8.3	-8.8	-8.8	-8.8
NAL2 - Reservoir Keepers House	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	19.9	21.4	24.6	28.1	30.2	30.2	30.2	30.2
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	31.2	32.4	32.8	32.9	33.0
	Difference	-	-	-	-	-	-3.1	-2.2	-2.6	-2.7	-2.8
NAL3 - Cairnoch Farm	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	30.2	31.3	31.6	31.7	31.9
	Difference	-	-	-	-	-	2.0	3.0	2.7	2.6	2.4
NAL4 - Cairnoch Bothy	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	24.0	25.5	28.7	32.2	34.3	34.3	34.3	34.3
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	30.4	31.5	31.8	31.9	32.1
	Difference	-	-	-	-	-	1.8	2.8	2.5	2.4	2.2
NAL5 - Gartcarron Fintry	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	19.1	20.6	23.8	27.3	29.4	29.4	29.4	29.4
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	34.4	35.3	35.6	35.8	35.9
	Difference	-	-	-	-	-	-7.1	-5.9	-6.2	-6.4	-6.5
NAL6 - Todholes	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	19.2	20.7	23.9	27.4	29.5	29.5	29.5	29.5
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	35.2	36.1	36.4	36.6	36.7
	Difference	-	-	-	-	-	-7.8	-6.6	-6.9	-7.1	-7.2
NAL7 - Cairnoch Lodge	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	26.6	28.1	31.3	34.8	36.9	36.9	36.9	36.9
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	38.3	39.3	39.7	39.9	40.0
	Difference	-	-	-	-	-	-3.5	-2.4	-2.8	-3.0	-3.1
NAL8 - Easter Cringate	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	25.5	27.0	30.2	33.7	35.8	35.8	35.8	35.8
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	38.7	39.7	40.1	40.3	40.4
	Difference	-	-	-	-	-	-5.0	-3.9	-4.3	-4.5	-4.6
NAL9 - Easter Cringate Cottage	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	20.0	21.5	24.7	28.2	30.3	30.3	30.3	30.3
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	40.4	41.5	41.9	41.9	41.9
	Difference	-	-	-	-	-	-12.2	-11.2	-11.6	-11.6	-11.6
NAL10 - Earlsburn Cottage	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	17.7	19.2	22.4	25.9	28.0	28.0	28.0	28.0
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	38.7	39.7	40.1	40.4	40.6
	Difference	-	-	-	-	-	-12.8	-11.7	-12.1	-12.4	-12.6
NAL11 - Ryecroft	Predicted Wind Turbine Noise L_{A90} Proposed Development	-	-	16.6	18.1	21.3	24.8	26.9	26.9	26.9	26.9
	Predicted Wind Turbine Noise L_{A90} Other Schemes	-	-	-	-	-	39.5	40.6	40.8	40.8	40.9
	Difference	-	-	-	-	-	-14.7	-13.7	-13.9	-13.9	-14.0

Annex 5 – Summary of Wind Turbine Noise Source Data

Wind Turbine Noise Data Assumptions

Table A5.1 - Sound Power Level Data

Wind Farm	Turbine	Hub height (m)	Added Uncertainty	Reference Wind Speed (ms^{-1}) Standardised to 10m Height									
				3	4	5	6	7	8	9	10	11	12
Craigannet Farm	Vensys VE82, 1.5 MW	58	2	-	-	-	102.9	105.2	105.6	105.9	106.4	106.4	106.4
Craigengelt Wind Farm	Nordex N90, 2.5 MW	80	2	-	99.5	103.0	106.0	107.0	107.5	107.5	107.5	107.5	107.5
Earlsburn North Wind Farm	Nordex N90/2500HS, 2.5 MW	70	2	-	98.7	102.2	105.2	106.4	106.9	107.0	107.0	107.0	107.0
Earlsburn Wind Farm	Nordex N80, 2.5 MW	70	2	-	98.2	100.8	102.8	103.6	104.1	104.6	104.9	105.0	105.0
Easter Cringate	Proven 6 kW	15	2	-	77.8	80.1	82.3	84.6	86.8	89.0	91.3	93.5	95.8
Earlsburn Extension Wind Farm (1)	Vestas V117, 4.2 MW, with Serrated Blades	76.5	2	-	97.7	101.8	105.5	107.7	108.0	108.0	108.0	108.0	108.0
Earlsburn Extension Wind Farm (2)	Vestas V136, 4.0 MW, with Serrated Blades	82	2	-	96.6	101.4	105.2	105.9	105.9	105.9	105.9	105.9	105.9
Shelloch Wind Farm (1)	Vestas V150, 6.0 MW, with Serrated Blades*	105	4.1	-	100.3	104.6	108.1	108.9	109.0	109.0	109.0	109.0	109.0
Shelloch Wind Farm (2)	Vestas V136, 4.0 MW, with Serrated Blades*	81.5	5.1	-	99.7	104.5	108.3	109.0	109.0	109.0	109.0	109.0	109.0
Drummarnock Wind Farm	Nordex N163, 7 MW, with Serrated Blades	98.5	2	Under NDA, Data Available Upon Request. Maximum Sound Power Level of 109.2 dB.									
Proposed Development (Ciarnoch Hill Wind Farm)	Vestas V162, 7.2MW, with Serrated Blades	99	2	Under NDA, Data Available Upon Request. Maximum Sound Power Level of 108.3 dB.									

* Uplifted to an overall Sound Power Level of 109 dB, as per the Shelloch Wind Farm Decision Notice

Table A5.2 - Octave Band Data

Wind Farm	Turbine	Reference Wind Speed (m/s)	Octave Band (Hz)								
			63	125	250	500	1000	2000	4000	8000	Overall
Craigannet Farm	Vensys VE82, 1.5 MW	8	91.3	96.3	99.5	98.5	98.9	96.9	92.6	81.8	105.6
Craigengelt Wind Farm	Nordex N90, 2.5 MW	8	92.7	96.8	101.2	101.6	100.1	99.0	95.0	87.4	107.5
Earlsburn North Wind Farm	Nordex N90/2500HS, 2.5 MW	8	92.1	96.2	100.6	101.0	99.5	98.4	94.4	87.1	106.9
Earlsburn Wind Farm	Nordex N80, 2.5 MW	8	87.1	94.9	98.5	99.0	96.3	93.6	87.3	77.2	104.1
Easter Cringate	Proven 6 kW	8	80.9	77.9	75.3	74.1	71.5	66.6	60.6	63.1	86.8
Earlsburn Extension Wind Farm (1)	Vestas V117, 4.2 MW, with Serrated Blades	7	88.1	95.3	100.1	102.4	102.2	99.5	94.3	86.6	107.8
Earlsburn Extension Wind Farm (2)	Vestas V136, 4.0 MW, with Serrated Blades	9	86.4	94.3	99.2	101.1	100.0	95.8	88.5	78.2	105.9
Shelloch Wind Farm (1)	Vestas V150, 6.0 MW, with Serrated Blades*	8	90.1	97.7	102.4	104.1	103.0	98.9	91.9	81.9	109.0
Shelloch Wind Farm (2)	Vestas V136, 4.0 MW, with Serrated Blades*	9	89.5	97.4	102.3	104.2	103.1	98.9	91.6	81.3	109.0
Drummarnock Wind Farm	Nordex N163, 7 MW, with Serrated Blades	8	Under NDA, Data Available Upon Request. Maximum Sound Power Level of 109.2 dB.								
Proposed Development (Ciarnoch Hill Wind Farm)	Vestas V162, 7.2MW, with Serrated Blades	8	Under NDA, Data Available Upon Request. Maximum Sound Power Level of 108.3 dB.								

* Uplifted to an overall Sound Power Level of 109 dB, as per the Shelloch Wind Farm Decision Notice

Technical Appendix 14.1: Aviation Lighting Letter

Cairnoch Hill Wind Farm

Eurowind Energy Limited

Aviation and Windfarm Policy,
CAA Strategy and Policy Department,
UK Civil Aviation Authority.

By email

Fao Andy Wells

Cairnoch Hill Wind Farm – proposed lighting fitment

Wind Farm Aviation Safeguarding Ltd (WFAS) have been instructed by their clients, SLR Consulting, to submit details of a proposed lighting scheme for the Cairnoch Hill wind farm development (previously Carron Valley).

The Cairnoch Hill wind farm consists of four turbines, each with a tip height of 180m and at the following positions:

Turbine No.	Easting	Northing	Grid Ref
1	269183	686380	NS 69183 86380
2	269514	685957	NS 69514 85957
3	270220	685551	NS 70220 85551
4	270707	685384	NS 70707 85384

The client proposes a lighting design that will be compatible with the requirements of CAP 764.

The development is arranged in a line, roughly east/west above the Carron Valley reservoir. Given the spacing between the turbines the developer has decided not to seek to minimise the lighting layout. The Cairnoch Hill site does not benefit appreciably from the dispensations available in the latest CAA CAP 764 and MOD Obstruction Lighting Guidance to reduce the number of obstruction lights required at the turbine site; perhaps only one could have been removed and the client has elected to light all four turbines.

The site sits in Class G airspace, underneath the Glasgow CTA, and within LFA 16. Accordingly, the lighting requirement has been determined as Class G en-route and with

provision for MoD compliant infra-red lighting.

Civil Lighting

The ANO 2000/200cd Lights will conform to the required ICAO specification as set out in Annex 14 and CAA Policy (CAP 764, 4.6). (The lighting under consideration is the CEL MI-AKR or equivalent.)

The lights (IR and visible red lights) will be switched on between Evening Civil Twilight and Morning Civil Twilight in accordance with the UK Almanac; approximately 11 hours per day averaged over the year.

Additionally, it is proposed to take advantage of the CAA SARG Policy Statement dated 01/06/2017,

> '*If the horizontal meteorological visibility in all directions from every wind turbine generator in a group is more than 5 km, the intensity for the light positioned as close as practicable to the top of the fixed structure required to be fitted to any generator in the windfarm and displayed may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type'*.

and to incorporate the option to reduce the hub height lighting to not less than 10% of the minimum peak intensity specified for the installation in good weather. In essence, reducing the 2000cd obstruction lights to 200cd in meteorological visibilities greater than 5km.

This reduction in power will not apply to MOD IR Lights.

MoD Infra-red lighting.

All four turbine will be lit with MoD infrared lighting and in accordance with MoD Specification IR.

Our client anticipates that it will be necessary to agree a Planning Condition to reflect the lighting requirement and would be grateful for any proposed wording that would form the basis of an agreement. If this proposed layout meets with the approval of the CAA it will, then, be passed to the MoD for their further consideration.



Wind Farm Aviation Safeguarding Ltd (for SLR Consulting)

WFAS
Wind Farm Aviation Safeguarding
Aviation wind, solar & physical safeguarding expertise
Lakeside Offices, The Old Cattle Market, Helston, Cornwall. TR13 0SR
Registered in England and Wales. Reg No.13953448

Technical Appendix 15.1: Carbon Balance Assessment

Cairnoch Hill Wind Farm

Eurowind Energy Limited

Prepared by:

SLR Consulting Limited

The Tun, 4 Jackson's Entry, Edinburgh, EH8 8PJ

SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	19 June 2026	A. Dickson	R. Watson	A.Smith

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Eurowind Energy Limited (the Applicant) as part or all of the services it has been appointed by the Applicant to carry out. It is subject to the terms and conditions of that appointment.

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Acronyms and Abbreviations

BEIS	Department for Business, Energy & Industrial Strategy
BREP	Biodiversity Restoration and Enhancement Plan
CO_2	Carbon Dioxide
DUKES	Digest of UK Energy Statistics
ECU	Energy Consents Unit
eq	Equivalent
g/cm^3	grams per cubic centimetre
GHG	Greenhouse Gas
ha	hectare
km	kilometre
Lidar	Light Detection and Ranging
m	metre
MW	Megawatt
SEPA	Scottish Environment Protection Agency

1.0 Introduction

Increasing atmospheric concentrations of greenhouse gases (GHGs), including carbon dioxide (CO_2), also referred to as carbon emissions, are resulting in climate change. A major contributor to this increase in GHG emissions is the burning of fossil fuels. With concern growing over climate change, reducing its cause is of upmost importance. The replacement of traditional fossil fuel power generation with renewable energy sources provides high potential for the reduction of GHG emissions. This is reflected in UK and Scottish Governments' climate change and renewable energy policy and commitments.

Whilst the Cairnoch Hill Wind Farm ("the Proposed Development") will reduce carbon emissions by replacing the need to burn fossil fuels for power, no form of electricity generation is completely carbon free; for onshore wind farms, there will be emissions resulting from component manufacturing, transportation and installation processes associated with the Proposed Development.

In addition to the lifecycle emissions from the development equipment and infrastructure, where a development is located on carbon rich soils such as peat or within forestry, there are potential emissions resulting from direct action of excavating peat for construction and also the indirect changes to hydrology that can result in losses of soil carbon, as well as forestry felling. The footprint of a development's infrastructure will also decrease the area covered by carbon-fixing vegetation.

Conversely, restoration activities undertaken post-construction or post-decommissioning could have a beneficial effect on carbon uptake through the restoration of modified bog habitat. Carbon losses and gains during the construction and lifetime of a wind farm, and the long-term impacts on the peatlands on which they are sited, need to be evaluated to understand the consequences of permitting such developments.

A technical review of energy displacement by the UK Energy Research Centre (UKERC) considered over two hundred studies and papers from around the world for the UK Government and concluded that *"it is unambiguously the case that wind energy can displace fossil fuel-based generation, reducing both fuel use and carbon dioxide emissions"* (UKERC, 2006). Whilst the wind turbines will reduce carbon emissions by replacing the need to burn fossil fuels for power, there is the potential for carbon fixers and sinks to be lost through the clearing of vegetation and materials for construction. There must therefore be a sufficient balance between the carbon reduced and that which is produced and lost through associated processes.

Methodology

In Scotland, applications submitted under Section 36 of the Electricity Act 1989 are required to undertake the carbon balance assessment using the Scottish Government's carbon calculator tool. Whilst the Proposed Development is not a Section 36 development, and therefore a carbon balance assessment is not a statutory requirement, the tool is still useful to determine the overall payback time and emissions savings due to the wind element of the Proposed Development..

This online tool is supported by two documents published by the Scottish Government and Scottish Renewables, and Scottish Environment Protection Agency (SEPA) to aid in calculating the potential carbon losses and savings.

At the time of submission, the online tool is not accessible, and therefore the assessment has been undertaken using the Carbon Assessment Tool spreadsheet (v2.15.0), issued by SEPA.

The Carbon Calculator compares an estimate of the carbon emissions from the construction, operation, and decommissioning of the Proposed Development to those emissions estimated from other electricity generation sources. Input parameters are based on the Proposed

Development design, infrastructure dimensions, results from peat depth surveys and laboratory testing of peat, and other information gained from site survey work, desk study and, where applicable, assumptions relating to groundwater, drainage, and habitat regeneration. As no infrastructure has yet been constructed for the Proposed Development, the assumptions relating to infrastructure have been based on the design envelope for the Proposed Development or from standard, default representative information.

2.0 Input Parameters

The carbon calculator submitted allows a range of data to be input to utilise expected, minimum and maximum values, where relevant and applicable. If several parameters are varied together, however, this can have the effect of 'cancelling out' a single parameter change. For this reason, the approach for this assessment, has been to include 'maximum values' as those values which would result in longest (maximum) payback period; and 'minimum values' as those values which would result in the shortest (minimum) payback period. The expected value is based on the most realistic option for the Proposed Development.

Information relating to the Proposed Development (including consideration of design, operation, and construction) has been collated, and includes details of the proposed infrastructure, local ecology, and restoration proposals associated with the Proposed Development. This collated information has been entered into the Carbon Assessment Tool spreadsheet and is outlined below.

Wind Farm Characteristics

The Proposed Development will comprise up to 4 wind turbines with an expected power rating of 6.2MW. The operational life of the Proposed Development is expected to be 40 years, however, the input parameter within the tool is fixed at 25 years. This does not affect the validity of the assessment; it just reflects a conservative approach.

Capacity Factor

The anticipated site specific capacity factor is estimated to be 40%.

Back Up

The Carbon Calculator indicates that if over 20% of national electricity is generated by wind energy, the extra capacity required for backup is 5% of the rated capacity of the wind plant. The values for 'fraction of output to backup' are therefore input as expected 5% and maximum 5% to represent full requirement for backup, and a minimum of 0% to represent no backup required (Nayak et al., 2008). SEPA indicates that for this parameter, the electricity generation capacity of Scotland, rather than the UK, should be considered. In 2022, Scotland generated about 66% of gross electricity consumption via onshore wind (Scottish Renewables Statistics, 2023). Where the balancing capacity is obtained from fossil fuel generating stations, emissions will increase by 10% due to reduced thermal efficiency of the reserve generation stations (Dale et al., 2004). This value is fixed in the Carbon Calculator.

CO_2 Emissions from Turbine Life (tCO_2/MW)

CO_2 emissions during the life of a wind turbine include emissions that occur during the manufacturing, transportation, erection, operation, dismantling and removal of the structures. As there is no direct Life Cycle Assessment for the Proposed Development available at this point in time, the inbuilt Carbon Calculator option which allows for emissions to be calculated according to wind turbine capacity has been selected.

Characteristics of Peatland Before Wind Farm Development

Type of Peatland

The most appropriate peatland habitat description available within the Carbon Calculator is Acid Bog, refer to **Chapter 8: Ecology**.

Average Annual Air Temperature at Site

The average annual air temperature of 9.25°C is based on average annual temperature data from the Met Office UK climate averages (Met Office, 2025). The nearest climate station which provides this information is located at Stirling S Wks, approximately 12km north east of the Proposed Development location ("the Site").

Average Peat Depth at Site

The Site has an average peat depth of 0.3m. The average peat depth of 0.3m was calculated based on peat probing that was carried out within the Site boundary.

The average peat depth is based on a series of average soil depths taken from peat surveys undertaken at the site. Probe locations on mineral and peaty soils (<0.5 m) are included within the averages.

Carbon Content of Dry Peat

Site specific values for the carbon content of the peat are not available, so the standard values from the 'Windfarm Carbon Calculator Web Tool, User Guidance' have been used. The carbon content ranges from 49% to 62% with an expected value of 55% used. This reflects a range of values typical of the carbon content anticipated from Scottish Peatlands (Birnie et al 1991 and Lindsay 2010).

Average Extent of Drainage around Drainage Features at Site

Site specific values for the average extent of drainage around drainage features at Site are not available, so the standard values from the 'Windfarm Carbon Calculator Web Tool, User Guidance' have been used. The expected value is 10m, with a minimum of 5m and maximum of 50m.

Average Water Table Depth at Site

Site specific values for the average water table depth at the Site are not available, so the values for 'intact peat' from 'Windfarm Carbon Calculator Web Tool, User Guidance' have been used as a worst-case scenario. The expected value is 0.3m, with a minimum 0.1m, and a maximum 0.5m.

Dry Soil Bulk Density

To derive a representative site-specific value for this parameter, Scottish generic values for peat from 'Windfarm Carbon Calculator Web Tool, User Guidance' have been used. The expected value is 0.132 g/cm^3, with a minimum of 0.072 g/cm^3 and a maximum of 0.293 g/cm^3.

Characteristics of Bog Plants

Time Required for Regeneration of Bog Plants After Restoration

The time required for the regeneration of bog plants after restoration (following construction activities) can vary widely depending on the location of the Site, the target bog plants for restoration, and whether the ground was previously afforested or open moorland. The speed of regeneration will also depend on species present and their colonising ability and traits, as well as the methods of restoration and maintenance of hydrology. Typical bog plants may take longer to establish where suitable conditions exist. The values stated take this into account considering available literature and anectodical observations of wind farms in Scotland.

As outlined in the Windfarm Carbon Calculator Web Tool, User Guidance, 10 years has been stated as a reasonable precautionary estimate for the regeneration time needed for most bog species, with a minimum of five years and a longer establishment time of 15 years.

Carbon Accumulation

Carbon accumulation is the net amount of carbon that remains permanently stored as peat each year after accounting for plant growth and decay. The Carbon Calculator Guidance (Technical Note, Version 2.10.0, Scottish Government) suggests a mid-range value, for carbon accumulation, of 0.25 tC ha^{-1} yr^{-1} and a range of 0.12 to 0.31 t C $ha^{-1}yr^{-1}$.

Forestry Plantation Characteristics

Area of Forestry Plantation to be Felled (ha)

A total of 34.4ha of forestry is to be felled as a result of the Proposed Development.

Average Rate of Carbon Sequestration in Timber

The average rate of carbon sequestration in timber to be felled onsite has been calculated as 3.6 tC ha^{-1} yr^{-1} (Cannell, 1999).

Counterfactual Emission Factors

The counterfactual emission factors for three methods of energy generation are fixed in the carbon calculator. Values for both coal-fired and fossil fuel-mix emission factors are updated from Diget of UK Energy Statistics (DUKES) data for the UK which is published annually. The source for the grid-mix emission factor is the list of emission factors used to report on greenhouse gas emissions by UK organisations published by the Department for Energy Security and Net Zero (DESNZ)).

Borrow Pits

One borrow pit search area has been included for the Proposed Development (refer to **Chapter 3: Description of the Development**). Although the proposed borrow pit search area is not sited on peatland, conservatively, this has been included in the assessment, this is an borrow pit that will be extended as part of the Proposed Development. The final dimension of the borrow pit has yet to be defined however initial calculations, based on a series of assumptions (including suitable aggregate being located close to surface), estimate an excavation area of 9,119m^2 would provide sufficient yield. These dimensions have been included for the borrow pit.

The average peat depth in the borrow pit search areas is 0.1m, conservatively, organic soils (<0.5m) have also been included in the calculation of averages.

Foundation and Hardstand Areas

The wind turbine foundations for the Proposed Development are expected to measure approximately 27m in diameter, with hardstands expected to measure approximately 99m x 35m.

The average peat depth in the wind turbine foundation areas is 0.5m, and the average peat depth in the hardstand areas is 0.4m. Conservatively, organic soils (<0.5m) have also been used in the calculation of averages.

Access Tracks

There is 7,405m of existing track to be upgraded within the Site. The total length of new access tracks proposed is approximately 2,318m. Small changes to the access track layout may occur post consent (e.g., as a result of micrositing) leading to minor variations to the overall track length.

The average peat depth on the route of the proposed cut access track is 0.2m. Conservatively, organic soils (<0.5m) have also been used in the calculation of averages.

Cable Trenches

The wind farm array cables onsite will be laid in trenches, laid on a sand bed and backfilled using suitably graded material, and will mainly be located adjacent to the access tracks within the Proposed Development.

Additional Peat Excavated

There is no predicted additional peat to be excavated. Further information can be found in **Technical Appendix 10.2: Outline Soils and Peat Management Plan**.

Peat Landslide Hazard

The peat landslide hazard is a fixed value automatically defined by the Carbon Calculator and is shown to be ‘negligible’.

Improvement of Carbon Sequestration at Site

Technical Appendix 10.6: Borrow Pit Assessment outlines that the proposed borrow pit will be restored following the completion of construction. This is a total area of 0.9ha.

Technical Appendix 8.6: Outline Habitat Management Plan, sets out proposals to compensate for habitat loss and provide biodiversity enhancements. This includes 15.46ha of broadleaf woodland creation which is proposed.

3.0 Carbon Calculator Output

The output from the Carbon Calculator indicates the expected total carbon dioxide loss for the Proposed Development (from manufacture of wind turbines, construction, decommissioning, and carbon sink losses, also taking account of gains due to restoration) is 45,215 tonnes of carbon dioxide (tCO_2 eq). Input and output parameters are detailed in **Annex A**.

Scottish Government guidance on wind farm carbon savings (Scottish Government, 2022), states: "*carbon emission savings from wind farms should be calculated using the fossil fuel sourced grid mix as the counterfactual, rather than the grid mix.*" Taking account of the expected total CO_2 loss from the Carbon Calculator result, the Proposed Development would be expected to result in a saving of approximately 38,931 tonnes of carbon dioxide (tCO_2) per annum, meaning a total of over 1.5 million tonnes over the 40-year operational lifetime of the Proposed Development, through displacement of carbon-emitting generation.

The carbon payback time of the Proposed Development is expected to be a period of 1.2 years (approximately 14 months). This is the period of time for which a wind farm needs to be in operation before it has, by displacing generation from fossil-fuelled power stations, avoided as much carbon dioxide as was released in its lifecycle.

As recommended in current guidance estimated savings are for replacement of fossil fuel electricity generation but, while this could be the case in the short term, it is not the most probable scenario in the longer-term. The grid-mix of electricity generation represents the overall carbon emissions from the grid per unit of electricity and includes nuclear and renewables as well as fossil fuels. Based on the grid-mix results, the Proposed Development is expected to result in a saving of approximately 15,381 tCO_2 per annum with an expected carbon payback time of 2.9 years.

Annex A Carbon Calculator Input and Outputs

Technical Appendix 15.1: Carbon Balance Assessment

Cairnoch Hill Wind Farm

SLR Project No.: 428.012085.00001

Results

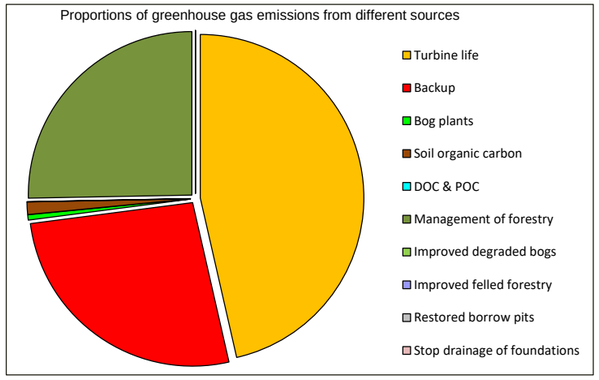
PAYBACK TIME AND CO_2 EMISSIONS

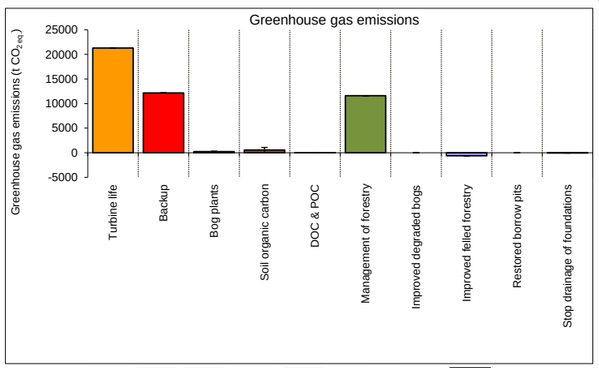
Note: The carbon payback time of the windfarm is calculated by comparing the loss of C from the site due to windfarm development with the carbon-savings achieved by the windfarm while displacing electricity generated from coal-fired capacity or grid-mix.

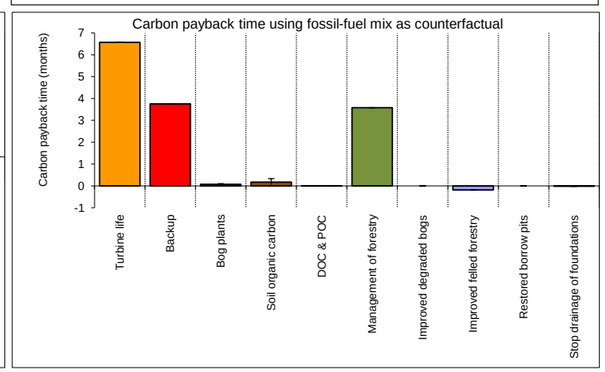
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Click here to return to Instructions Click here

	Exp.	*Min.*	*Max.*
1. Windfarm CO_2 emission saving over…			
…coal-fired electricity generation (tCO_2 yr^{-1})	79860	79860	79860
…grid-mix of electricity generation (tCO_2 yr^{-1})	15381	15381	15381
…fossil fuel - mix of electricity generation (tCO_2 yr^{-1})	38931	38931	38931
Energy output from windfarm over lifetime (MWh)	2172480	2172480	2172480
Total CO_2 losses due to wind farm (t CO_2 eq.)			
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	21302	21302	21302
3. Losses due to backup	12166	12166	12166
4. Losses due to reduced carbon fixing potential	238	98	337
5. Losses from soil organic matter	562	-41	1081
6. Losses due to DOC & POC leaching	6	2	10
7. Losses due to felling forestry	11607	11607	11607
Total losses of carbon dioxide	45881	45133	46503
8. Total CO_2 gains due to improvement of site (t CO_2 eq.)			
8a. Change in emissions due to improvement of degraded bogs	0	0	0
8b. Change in emissions due to improvement of felled forestry	-609	-588	-633
8c. Change in emissions due to restoration of peat from borrow pits	0	0	0
8d. Change in emissions due to removal of drainage from foundations & hardstanding	-57	-52	-62
Total change in emissions due to improvements	-666	-641	-695

RESULTS	*Exp.*	*Min.*	*Max.*
Net emissions of carbon dioxide (t $CO_{2\ eq.}$)	**45215**	**44438**	**45862**
Carbon Payback Time			
…coal-fired electricity generation (years)	0.6	0.6	0.6
…grid-mix of electricity generation (years)	2.9	2.9	3.0
…fossil fuel - mix of electricity generation (years)	**1.2**	**1.1**	**1.2**
Ratio of soil carbon loss to gain by restoration (TARGET ratio (Natural Resources Wales) < 1.0)	**No gains!**	**No gains!**	**No gains!**
Ratio of CO_2 eq. emissions to power generation (g / kWh) (TARGET ratio by 2030 (electricity generation) < 50 g /kWh)	**21**	**20**	**21**







Check Check Check Check Check Check Check Check Check Check

Data used in barchart of carbon payback time using fossil-fuel mix as counterfactual

Greenhouse gas emissions

	Exp.	*Min*	*Max*
Turbine life	21302	0	0
Backup	12166	0	0
Bog plants	238	140	99
Soil organic carbon	562	603	519
DOC & POC	6	4	4
Management of forestry	11607	0	0
Improved degraded bogs	0	0	0
Improved felled forestry	0	0	0
Restored borrow pits	0	0	0
Stop drainage of foundations	0	0	0

Data used in barchart of carbon payback time using fossil-fuel mix as counterfactual

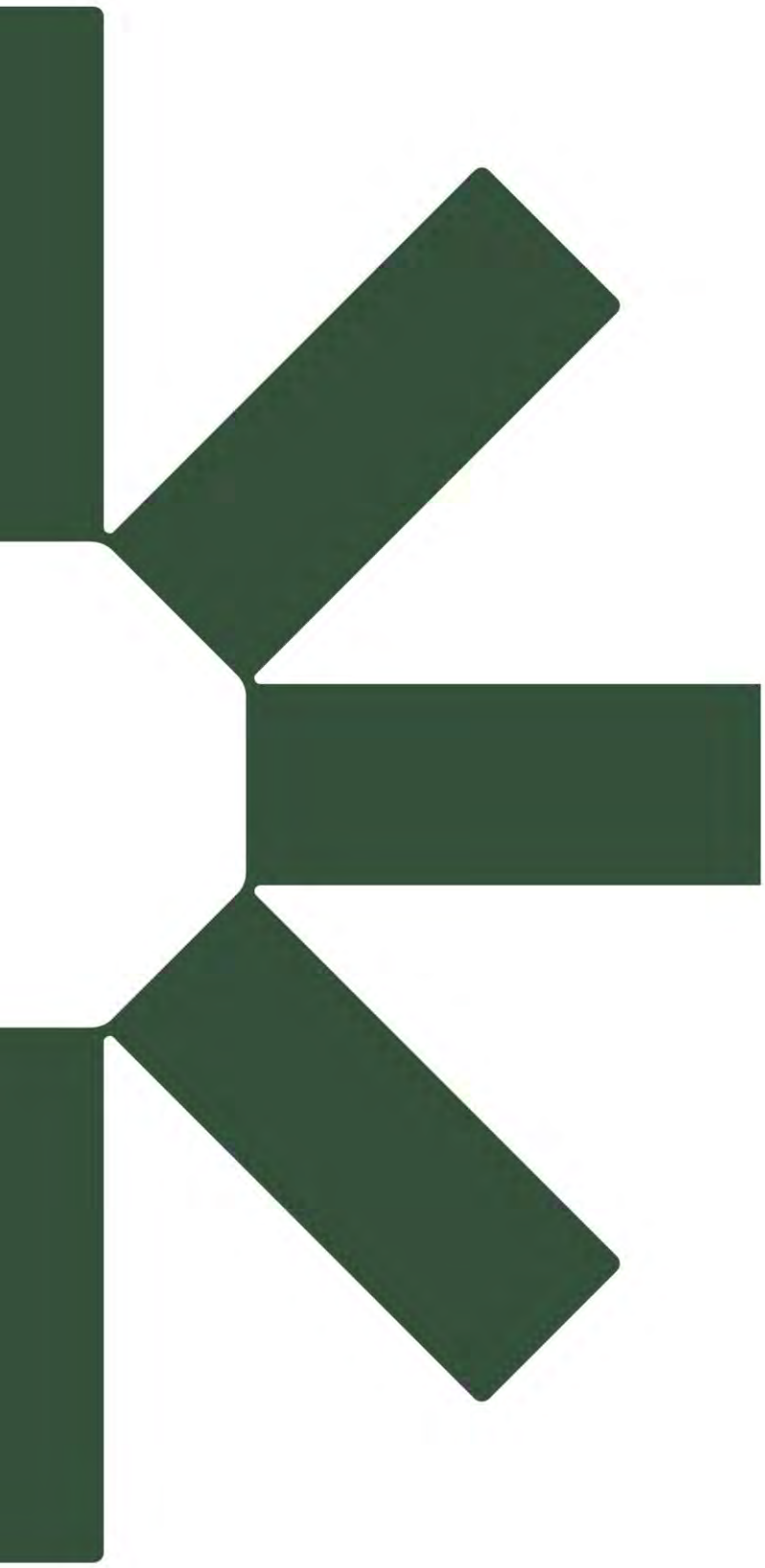
Greenhouse gas emissions				Carbon payback time (months)		
	Exp.	*Min.*	*Max.*	*Exp.*	*Min.*	*Max.*
Turbine life	21302	0	0	7	0	0
Backup	12166	0	0	4	0	0
Bog plants	238	140	99	0	0	0
Soil organic carbon	562	603	519	0	0	0
DOC & POC	6	4	4	0	0	0
Management of forestry	11607	0	0	4	0	0
Improved degraded bogs	0	0	0	0	0	0
Improved felled forestry	-609	-21	-24	0	0	0
Restored borrow pits	0	0	0	0	0	0
Stop drainage of foundations	-57	-5	-5	0	0	0
	45215			14		

Results

PAYBACK TIME AND CO_2 EMISSIONS

Note: The carbon payback time of the windfarm is calculated by comparing the loss of C from the site due to windfarm development with the carbon-savings achieved by the windfarm while displacing electricity generated from coal-fired capacity or grid-mix.

Click here to return to Input data Click here
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Making Sustainability Happen

Technical Appendix 15.2: Outline Access Management Plan

Cairnoch Hill Wind Farm

Eurowind Energy Limited

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SLR Project No.: 428.V12085.00001

3 August 2026

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1	20 May 2026	B. Wyper	E. Quinn	A. Smith

Basis of Report

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Appendices

Appendix A Figures

Acronyms and Abbreviations

AMP	Access Management Plan
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
EIA	Environmental Impact Assessment
FLS	Forestry and Land Scotland
NGR	National Grid Reference
OAP	Outdoor Access Plan
OSGB	Ordnance Survey Great Britain
PAMP	Outline Access Management Plan
PC	Principal Contractor
RoW	Rights of Way
Scotways	The Scottish Rights of Way and Access Society
SLR	SLR Consulting Limited

1.0 Introduction

1.1 Project Overview

This document presents an outline Access Management Plan (AMP) for the proposed Cairnoch Wind Farm ("the Proposed Development"). This document outlines the principles and procedures which would be put in place to address potential impacts to public access during the construction, operation and decommissioning phases of the Proposed Development.

This document should be read in conjunction with the following documents that form part of the Environmental Impact Assessment (EIA) Report for the Proposed Development:

- **Chapter 1: Introduction;**
- **Chapter 3: Description of the Development; and**
- **Technical Appendix 3.1: Outline Construction Environmental Management Plan (CEMP).**

In addition to the above, this document should be read in conjunction with the Socio-Economic Report produced for the Proposed Development, by BiGGAR Economics.

1.2 Purpose and Scope of this Document

The location of the Proposed Development ("the Site") and surrounding forest is currently well-used by local people and visitors to the area, for recreation purposes.

The measures set out within this outline AMP are designed to formalise how constraints on the public accessing and passing through the Site, as a result of the Proposed Development, would be managed and communicated. This is to ensure compliance with relevant legislation and regulations, and to facilitate the continued recreational use, of the Site, by members of the public.

This outline AMP therefore provides information to consultees and members of the public, regarding access arrangements during construction and operation of the Proposed Development. This document sets out the Applicants proposals for ensuring that members of the public have adequate and appropriate access to and within the Site, in line with good practice, relevant legislation, and health and safety considerations. As this is an outline document, it is envisaged that, should the Proposed Development receive consent, there would be a planning condition requiring a detailed AMP be agreed through consultation with Stirling Council.

This document does not provide specific details of signage and interpretation etc., but provides outline examples or suggestions for further discussion and agreement with consultees.

2.0 Site Location and Description

The Proposed Development is centred on National Grid Reference (NGR) NS 69768 85606, is located wholly within the Stirling Council administrative boundary, although is only approximately 420m from the North Lanarkshire Council boundary to the south. The Site is located immediately north of the Carron Valley Reservoir (within 30m).

The current predominant land use of the Site is commercial forestry operations, with the Site being managed by Forestry and Land Scotland (FLS). The Site boundary comprises approximately 573ha of land within it and is predominantly covered with conifer plantation (of mixed age or recently felled).

Elevations across the Site range from approximately 227m AOD at the south western edge of the Site, to approximately 413m AOD in the centre of the Site (summit of Cairnoch Hill).

The nearest settlement is the hamlet at Carron Valley reservoir dam, approximately 1.25km east of the Site. Fintry is located approximately 6km to the west. Other nearby towns include Kilsyth, Denny, and Stirling, located approximately 5.3km to 8.3km from the Site. There are various scattered residential properties which are closer to the Site, such as Easter Cringate and Cairnoch Lodge to the north, and Cairnoch Bothy and Cairnoch Farm to the south.

The B818 runs on an east west axis between the southern boundary of the Site and the northern shoreline of the Carron Valley reservoir. The road links Denny in the east with the A875 to the west, providing connection to the settlements of Balfron and Killearn

An unclassified road spurs off the B818 and runs broadly south west to north east in the direction of Stirling.

Core paths in the vicinity of the Site (namely 9078Bb/71, NL/1/1, NL/2/1, NL/3/1[1]) lie to the north, east and south of Carron Valley reservoir and provide a Right of Way (RoW) network in and around the Kilsyth Hills.

A Scheduled Monument, Sir John de Graham's Castle (SM4278), is situated approximately 100m west of the Site. Further scheduled monuments lie to the east and west of the Site, with Todholes cairns (SM4491 and SM2492) located within 2km of the Site.

3.0 Access During Construction

3.1 General

As the Site is an operational commercial forest, managed by FLS, non FLS vehicle access to the Site is prohibited and controlled via locked gates. During construction of the Proposed Development, these restrictions to vehicular access (i.e. vehicles not associated with construction of the Proposed Development, or FLS operations) would continue.

Management of access to the Site during the construction phase will be by way of appropriate signage erected at the main access point to the Site and at strategic locations around the Site to inform the general public of any areas of the Site that are off limits / any access restrictions during construction, and provide updates on the progress of the construction programme.

These signs will be updated regularly to ensure that the most up to date information is provided to the public and will incorporate maps (where necessary) showing clearly which areas of the Site have restricted access and any alternative routes that could be used instead.

Where public access restrictions are insufficient in order to ensure the health and safety of members of the public, certain areas of the Site would be temporarily closed to the public. Complete closure of certain areas would be kept to a minimum in terms of extent and duration, so far as possible, with these closures linked to certain construction activities and certain areas of the Site.

Additional signage would be placed on the approaches to the Site, in order to warn members of the public that construction operations are ongoing and that Heavy Goods Vehicles (HGV's) and other plant may be existing and entering the Site.

[1] Scottish Government, Scotland's Environment Map – Core Paths

Signage would be designed, taking into account NatureScot's Good Practice During Wind Farm Construction, 4th Edition 2019, Part 7, Recreation and Access.

The Site access that would be permitted during construction extends to all non-motorised transport modes, notably walkers, runners, cyclists, wheelers and horse riders. Any gates erected to manage public access during construction would be designed to allow access for all legitimate user categories.

3.2 Construction Programme

A detailed construction programme for the Proposed Development, with key dates for construction works, would be produced by the Principal Contractor upon appointment.

Upon appointment of the wind turbine supplier, the delivery schedule of the wind turbine components would be incorporated into the construction programme.

An overview of the construction programme would be made publicly available, through means to be agreed with Stirling Council, prior to any construction work commencing. The construction programme would be updated as required and any such updates made public. This would allow members of the public to plan accordingly, helping to minimise disruption.

3.3 Public Rights of Way

3.3.1 Routes Affected

3.3.1.1 Within the Site

Within the Site boundary there are no Public Rights of Way which would be affected by the construction of the Proposed Development.

The Site does however have multiple forestry tracks crossing it, which are used by the public for recreational purposes such as walking and cycling. Some of these paths would have access restrictions and closures applied during the construction phase, as some existing tracks are to be widened, but also while certain key operations are ongoing e.g. wind turbine blade delivery.

Closures and restrictions on public usage of the forestry tracks would be temporary and only in place at appropriate points during construction of the Proposed Development. Once the construction phase has completed, the public would have the same access rights across the Site that they currently have.

3.3.1.2 Outside of the Site

The closest Core Path to the Proposed Development is Core Path 9078Bb/71, which runs from the north and meets the north western edge of the Site boundary (see **Figure 15.2.1**). There is a further cluster of Core Paths located to the south east of the Proposed Development (see **Figure 15.2.1**). The closest of these is North Lanarkshire Council's NL/1/1, which is approximately 1.7km to the south east of the Site. The NL/1/1 is associated with the NL/2/1 and NL/3/1, also located in the area.

With regards to Heritage Paths in the surroundings of the Proposed Development, there is one of particular note and which is associated with the aforementioned Core Path 9078Bb/71. Overlapping Core Path 9078Bb/71 is the Spout of Ballochleam[2] (HP385), an 8.3km Heritage Path originating in Kippen and ending adjacent to the Sites north western boundary.

[2] https://scotways.com/heritage-path/HP385/

As noted, the wider area has been subject to commercial forestry and therefore includes numerous forestry access tracks which could be used recreationally, dependent upon the status of the forestry workings within that particular area.

3.3.2 Management Measures

During construction of Cairnoch Hill Wind Farm, a number of management measures would be implemented at the adjoining/crossing location of Core Path 9078Bb/71 / Spout of Ballochleam Heritage Path to ensure the safety of users of the path.

The same management measures would be applied to all accesses to the existing FLS track network within the Site, specifically from the B818; from the east boundary (Craigannet); from the south west (Sir John de Graham's Castle); and from the west via Endrick Water.

The following control measures wwould be adopted:

- Provision of warning signage to raise awareness and inform users of the Core Path / FLS track(s) of hazards associated with approaching construction vehicles, specifically in proximity to the construction access;
- 'Heavy Plant Crossing' signs to warn users of construction vehicles;
- Information for users of the Core Path and tracks, especially at entry points to the Site, with contact details of the Contractor's liaison officer;
- A regular review of ground condition, to ensure the surface is safe for walkers and other users. Action will be taken to improve ground condition if required; and
- Whilst there is a presumption in favour of not gating a Core Path / FLS track, where these potentially cross the construction access road, there may be occasions when a gate arrangement is necessary to be in place periodically for the protection of users i.e. during periods of frequent construction vehicles. Gates erected to manage public access would be designed to allow access for all legitimate user categories.

3.4 Signage

Signs during construction would be designed in accordance with the Scottish Outdoor Access Code and the following best practice principles, as advised by the Paths for All Partnership and Scottish Natural Heritage in *"Advisory Signage for Outdoor Access: Good Practice Principles"*.

In particular:

a) Signage should apply only to the minimum area of the Site and the minimum duration required to safeguard people's safety;

b) Where people are crossing land rather than using paths and tracks, any necessary signs would be located at regular access points;

c) Signs would be carefully placed so that they are readily accessible, easily read and free of surrounding vegetation;

d) Signs would comply with the Disability Discrimination Act 1995. Good practice in the design and lay-out of signage should ensure that messages would be short and easy to understand, and be helpful to a wide range of abilities;

e) Signs are to be removed as soon as possible after the activity is complete or the hazard is no longer present;

f) Any symbols used on signage would be compliant with the Land Reform (Scotland) Act 2003 and the Scottish Outdoor Access Code;

g) Key signage would include the following information:

- details of the activity or hazard that visitors need to be aware of;
- the area affected by construction works and duration;
- the action people are requested to take and the reason for it;
- contact details; and
- a polite ‘thank you’.

The safety notice would also include contact details in case of emergencies.

3.5 Access under the Land Reform (Scotland) Act 2003

The Land Reform (Scotland) Act 2003 grants public access rights that are not Rights of Way, throughout Scotland, however, the Act also makes provision for temporarily removing this access right in the case of *“building, civil engineering or demolition works”* (Chapter 2, Part 6 (1) (g) (i)).

Under this provision some areas of the Site will be temporarily closed during particular construction activity to maintain the safety of the general public, and in particular recreational users. Where areas of the Site are closed, appropriate signage will be implemented.

On completion of any construction activity, the area will be re-opened for public access.

4.0 Operational Access

4.1 General

Following completion of the final phase of construction works and erection of all wind turbines, public access by non-motorised transport modes onto the Site would be reinstated in all areas of the Site with the exception of areas deemed unsafe, including the substation compound. These areas will not permit any unauthorised entry.

The public right to access across the Site during operation of the wind farm extends to all non-motorised transport modes, notably walkers, runners, cyclists, wheelers and horse riders. Any gates erected to manage public access (motorised transport) to the Site would be designed to allow access for all legitimate user categories.

4.2 Management Measures

Management of access to Site during the operational phase of the Proposed Development would take account of *“Good Practice During Wind Farm Construction, 4th Edition 2019, Part 7 Recreation and Access".*

4.3 Access under The Land Reform (Scotland) Act 2003

In order to comply with the Land Reform (Scotland) Act 2003, access will be made available to pedestrians maintaining public access as far as possible.

It should be noted that areas within the Site are subject to live forestry operations and as such under the Land Reform (Scotland) Act 2003, supported by the Scottish Outdoor Access Code, members of the public are required to take personal responsibility for their own actions and act safely as well as respect the interest of others.

5.0 Summary and Next Steps

This outline AMP has been prepared in order to set out the potential paths, routes and Rights of Way, which may be affected by the Proposed Development, and provide detail on how any such effects would be managed and mitigated.

The final version of the AMP (anticipated to be controlled via a planning condition attached to any forthcoming consent for the Proposed Development) would include detailed information about how access would be managed during construction of the Proposed Development and throughout the lifespan of the Proposed Development.

Appendix A Figures

Technical Appendix 15.2: Outline Access Management Plan

Cairnoch Hill Wind Farm

Eurowind Energy Limited

SLR Project No.: 428.V12085.00001

3 August 2026

264000 267000 270000 273000 276000

690000 687000 684000

LEGEND

- Site Boundary
- Proposed Turbine Location
- Proposed New Track
- Proposed Existing Track to be Upgraded
- Proposed Crane Pad / Hardstanding
- Proposed Substation Compound
- Proposed Construction Compound
- Proposed Blade Laydown Area

Walking Routes

- Core Path
- Heritage Path

Note
Relevant Core Paths have been labelled with the path code.

T1 T2 T3 T4

9078Bb/71

NL/1/1 NL/2/1 NL/3/1

0 1.25 2.5 5 Kilometres

Eurowind Energy

SLR

CAIRNOCH HILL WIND FARM

EIAR - TA15.2 - OUTLINE AMP

RECREATIONAL ROUTES

FIGURE 15.2.1

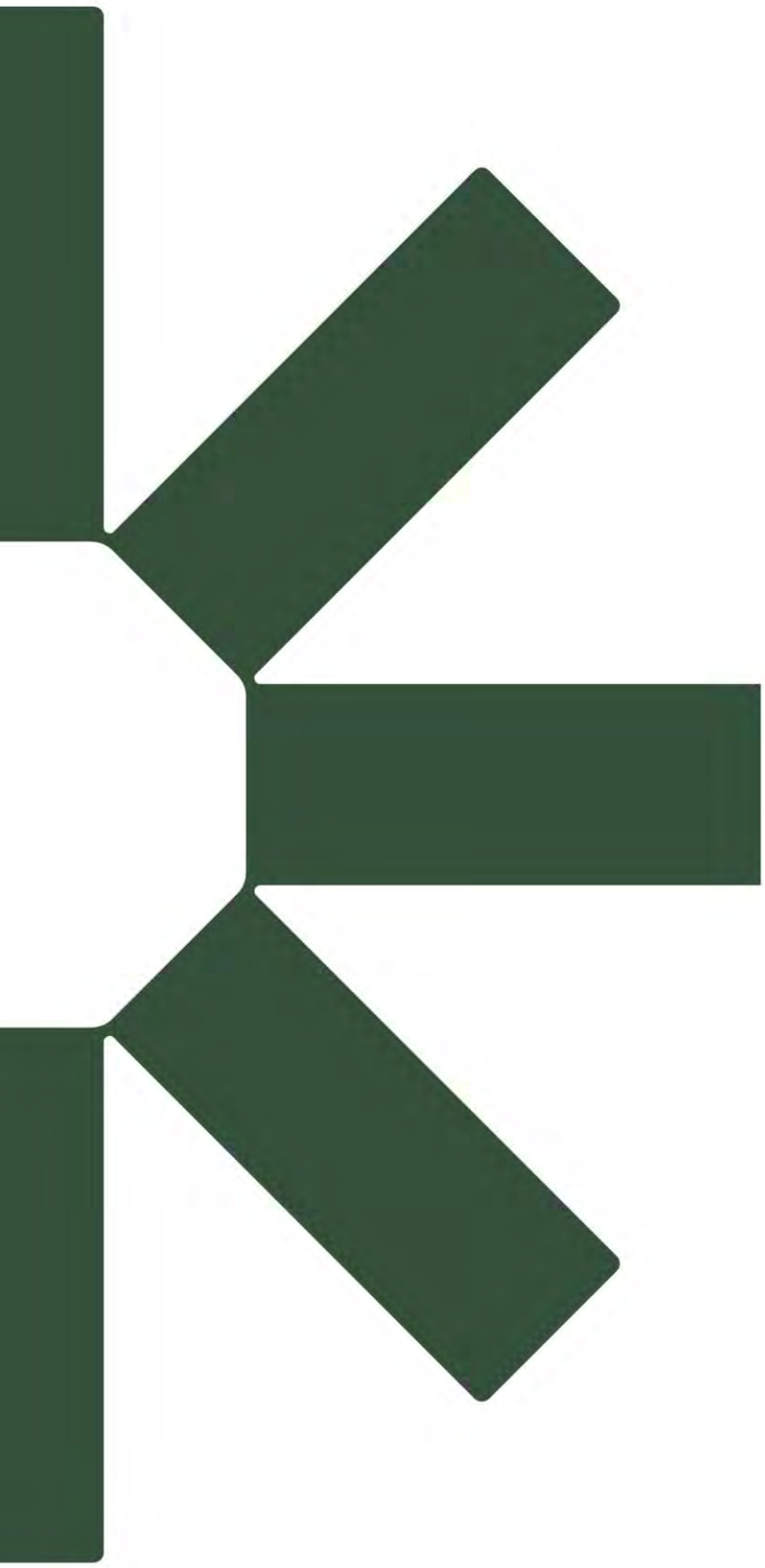
Scale 1:40,000 @ A3

Date JULY 2026

428.V12085.00001.0175.0 Recreational Routes

© Crown copyright [and database rights] (2026) AC0000808122 OS OpenData.
National Cycle Route Data supplied by Sustrans and contains Ordnance Survey data © Crown copyright [and database rights] (2024).
Heritage Path location informed from data from ScotWays

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